APPLICATION OF THE INNOVATIVE INCA ROAD MAP INSTRUMENT TO INTEGRATE FOREST FIRE RISK MITIGATION, CIVIL PROTECTION AND SPATIAL PLANNING - EASTERN ATTICA REGION, GREECE

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Abstract

Separation and isolation of Spatial Planning from other co-responsible policies for risk mitigation, i.e. civil protection and sectoral risk prevention, leads to unwelcome results: Reservation of a minor role or no role of Spatial Planning for Risk Mitigation; breaks in the Response-Preparedness-Prevention-Remediation chain; duplicated or diverging measures and funding; minimal attention to Prevention and emphasis on Emergency Management; inefficient resource consumption for Risk Mitigation.

All above failures are evident in the Greek Forest Fire Risk Management system which is weak in terms of prevention and ineffective in crisis management being expensive at the same time. These failures are more evident in the forest-fire prone regions of Greece, as is the Region of Attica wherein Athens is located. Despite stringency of the Greek Forest Law its implementation is a big problem because its rationale is totally incompatible with the Housing, Development and Spatial Planning reality and policies. Therefore, the co-responsible agencies for forest fire risk mitigation in Eastern Attica blame one another for the failure of the system instead of attempting mutual understanding and coordination.

The administration of the Attica Region however, had the opportunity to become a partner of the INCA (EU funded) project and apply the respectively introduced concept of “Agreement on Objectives” and the adjoining Road Map instrument in the mixed forest-residential area under the competence of the Directorate of Forests of Eastern Attica”. The present work attempts to present this application and results; also to recommend this approach as a model of Risk Governance even for centralized administrative systems as is currently the Greek one.

The specific application of the Road Map model in the area of East Attica evolved through a series of procedural steps, starting from a partnership establishment and agreement on objectives and goals, accommodating continuous feedback and leading to the implementation of a package of consensual multi- and inter-sectoral measures.

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The application of the model in the test area of Eastern Attica proved to be successful despite pre-existing administrative and cultural adversities. The major decisive factor has been the involvement of Local Authorities in the partnership (or Working Group). The test application indicated that a knowledge intensive institution and constant facilitation of feedback are preconditions of success. It is hoped that the successful experiment of application of the novel Risk Governance process in East Attica will be followed by imitators.

1. INTRODUCTION: The typical shortcomings of natural risk management and the promising INCA road map instrument

It has been acknowledged by scholars and practitioners as well that risk management failures are, more often than not due to the difficulties encountered in coordination / cooperation among the co-competent agencies and between them and the civil society. Some of the reasons / conditions underlying these difficulties have been identified as follows:

- Risk assessment and management has been entrusted to a wide variety of institutions which differ in scale / level of jurisdiction and sectoral responsibility. Taking as an example the case of forest fire risk we can address as co-responsible institutions those of Civil Protection, Forest Policy, Fire Service, Regional and Urban Spatial Planning and Housing Development.
- The policies exerted by above distinct and separate institutions are usually fragmented, introvert, self-complacent and sometimes authoritarian.
- These policies are decided and implemented without the consent, even knowledge, of citizens who may resort to their own plans undermining those of the formal institutions.

Above adverse conditions implying lack of coordination and non-harmonized risk management policies are accountable for:

- Breaks in the Remediation-Prevention-Preparedness-Response (RPPR) chain which however has to be a continuous and cohesive process;
- Marginalization of the role of Spatial Planning in Risk Management despite its outstanding significance;
- Lack of synergies among risk targeting policies;
- Duplicated funding or mutual subversion of risk management measures;
- Inefficient and ineffective resource consumption in the field of risk management policies;
- Irresponsibility of citizens (who usually blame the authorities in case of risk conditions and disaster occurence) and sometimes excessive tolerance of spatial law breaches / illegality on the part of formal spatial planning institutions;
- Risk intensification instead of risk mitigation.

The INCA rmodel of risk management –after the EU INCA project ("Linking Civil Protection and Planning by Agreement on Objectives") that was launched in 2009- was built with the aim to bridge spatial, functional and operational gaps and divergence in approach, competence and perspective between Civil Protection, Spatial Planning and other administrations in charge of prevention (see INCA booklet 2011). For this purpose the INCA pattern of policy-making was formulated as a collaborative process with concrete results to make measures and actions of risk prevention and mitigation efficient, effective, strategically aligned and sustainable (INCA booklet 2011).

The INCA model is founded on two fundamental elements: (a) A consensus building procedure attempting convergence on risk mitigation objectives by all co-responsible authorities and agencies and (b) a "Road Map" instrument. The first is the so-called "Agreement on objectives" (of risk mitigation and management) among all accountable authorities as well as stakeholders, which / who are involved in or affected by the risk and the risk mitigation process. All these actors formulate the Working Group (WG) which agrees on common objectives and the optimum blend of measures in order to reduce or mitigate a given risk.

The "Road Map" instrument (see Diagram 1) is a plan of successive operational steps to lead not only to a memorandum of commonly agreed objectives and measures by the WG but also to their actual implementation, monitoring and control of the respective results, feedback and review of the process.

Among others the INCA model has been applied in the case study area of East Attica region facing forest fires. East Attica region occupies the eastern part of the Region of Attica where the agglomeration of Athens is located.

2. Current deficiencies of Forest Fire Risk management in the Greece

Forest Fire Risk management in Greece is realized in a social and institutional context that is featured by the typical adverse conditions presented in the introductory chapter: (a) a crowd of institutions involved in forest fire risk management which vary in terms of spatial scale and sectoral competence; (b) risk management and other involved policies which are fragmented, introvert and often mutually conflicting; (c) public risk mitigation policies which are counteracted by the private plans of individuals, firms and households.

At first, indeed a wide variety of public institutions and policies are involved directly or indirectly in the causes and the short-, medium- and long-term impacts of forest fires, hence in forest fire risk generation and management. Among these policies, predominant are spatial planning and housing development policies. This is true because:

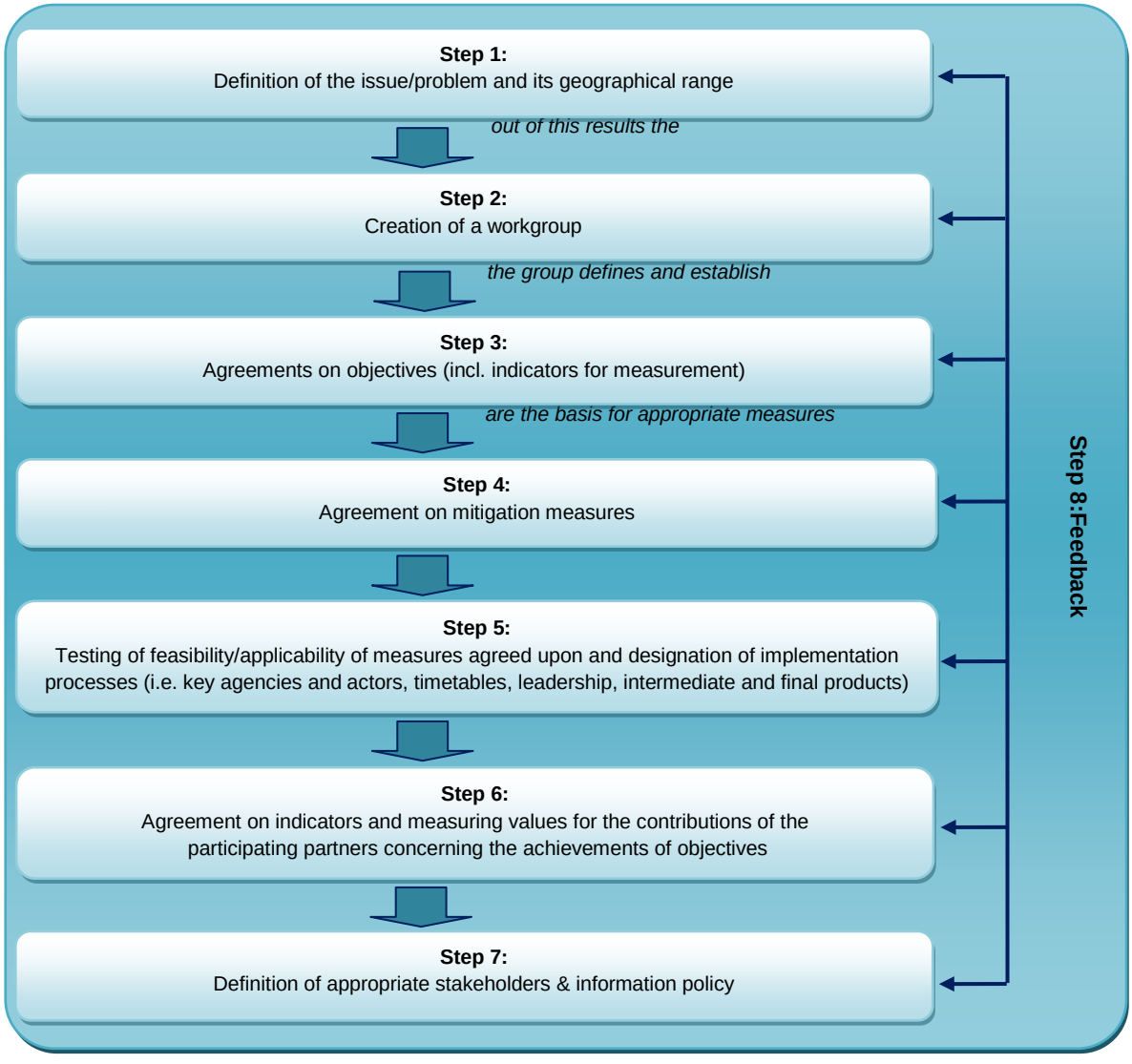
- All causal factors of forest fires (both intentional and those out of carelessness) are related to land use and land cover conflicts and

incompatibilities (mostly between forest land cover and various socio-economic land uses such as housing, tourism, recreation, grazing, agriculture, hunting etc).

- A large part of forest fires are related to the interests of the construction and real estate sectors (e.g. building development corporations); these can be controlled and regulated principally by appropriate spatial planning policies.
- The usual long-term and most catastrophic impacts after forest fires are city plan extensions and expansion of building development rights over burnt (and prior forest) land and in general moving on of mixed land use patterns where built land is entangled in wildland areas. These unwelcomed changes cannot be halted but only via appropriate spatial planning policies.

Despite the land use / cover dynamics generated by spatial, housing, tourism and other policies with land impact (or their absence), these are not taken into account by the policies for forest land protection. In Greece, forest policy is planned and implemented by the Forest Service and its regional extensions exclusively. In particular, the Forest Service exerts forest policy with administrative introversion meaning without coordination with the other policies bearing a land impact. This is the case, in spite of the fact that these other policies are accountable for incidents of forest land elimination (e.g. through arson).

Diagram 1: The Road Map instrument of the INCA Project (INCA project, Del E, 2011)



The variety of formal and informal institutions involved in forest fire risk generation and management refers not only to the sectoral but to the scalar dimension also. Responsible institutions can be found at all administrative levels, the central / national, the regional and the local level. The administrations directly involved in the matter of forest fire risk management are: the central Ministry of Rural Development enjoying competence on forest law and policy formulation at the national level; the Regional Directorates of Forests realizing the national level policy directions in the wildland areas of their jurisdiction; the Forest Service Offices (FSOs) and the Municipalities accountable for forest fuel clearance and other preventive and preparedness measures at the local level.

Secondly, the policies affecting one or the other way forest fire risk in Greece and the respective management actions are truly fragmented, uncoordinated, top-down and introvert. Decision-making in the field of forest policy is strictly hierarchical. Higher levels make decisions and the lower ones follow instructions and implement the generalized forest law and policy. As a consequence a uniform forest law and policy is implemented all over the country regardless of the diversity of factors and land use dynamics exerting pressure upon forest land, in coastal and inland regions, in mountainous and lowland regions, in peri-urban and rural regions and so on.

Lack of coordination is most evident between Spatial Planning and Forest Policy. For Spatial Planning forests and wildland areas are a “black hole” because these areas fall exclusively under the Forest Service responsibility. Under these circumstances, forests are not seen as an environmental amenity (a common good) but are elevated instead to a forbidden fruit, i.e. a factor obstructing realization of private visions and individual rights such as improvement of life quality by means of habitation of the countryside. This is because Forest Policy and the Forest Service have a biased and over-protective attitude toward forests. They view the forest ecosystem as independent from the social one and stand against whatever spatial development demand. Forest institutions protect forest as an absolute value regardless of the needs of the society.

Thirdly, the condition of absolute protection of forest land as dictated by the Forest Service comes in full contrast with the visions / interests of numerous social groups, private agencies and individuals. Examples are the urban citizens who have become alienated to the degraded urban environment of major cities and desire a second home in the forest, building development corporations with interrelated interests, building contractors, real estate agents, tourism entrepreneurs etc. In several cases

these groups realize their plans counter to the policy dictate of forest institutions and often after the tacit tolerance of spatial planning institutions. Indeed, as income levels continued to rise (up to 2009) more and more residents of Athens managed to obtain a legal, illegal or semi-illegal vacation home close to or within the peri-urban or coastal forests of East Attica. Speculators and building contractors turned the demand to profit and offered building plots and expensive villas (legal or illegal) at high profit. Consequently, a constantly changing and risky, mixed mosaic –with forest vegetation and buildings in close proximity- has been gradually created. This means that a common environmental good (the forest) and the associated public interest clashed with the perceived rights of individuals to improve their quality of life by inhabiting the wildland areas.

3. East Attica facing Forest Fire Risk: The INCA Road Map as a convincing response to Forest Fire Risk Management failures

3.1 Why East Attica?

The area of East Attica has been selected as an ideal case for the application of the INCA pioneer model because it represents an instructive example of mismanagement of forest fire risk in Greece (Kaoukis 2009; Sapountzaki et al. 2011):

- Out of the currently thirteen administrative regions of the country, the wider Attica Region is the most fire-prone on the basis of the indicator *percentage of burnt forest area to the total forest land of the Region in the period 1991-2004* (more than 26%);
- In the above period most of the fire events of the Region of Attica occurred in East Attica.
- In the same period most of the fire events in the Region of Attica have been registered as events of unknown causes (66,8% -see figures 1 and 2). Official ignorance of the actual root causes of the catastrophic phenomenon is a precursor of an ineffective risk management system.

The selected sub-region is an area of 193,000 ha which in 2001 amounted to 403,918 inhabitants (National Census of 2001). According to Sapountzaki et al. (2011, p. 1451):

> *"East Attica receives the urban sprawl of the Athens' agglomeration and is dotted with satellite settlements (especially along the eastern coastline) which are continuously growing. They are dominated by second homes or semi-permanent residential developments. Also, East Attica hosts the new international airport "Eleftherios Venizelos" which attracts speculative land uses and entrepreneurial activities yielding high land revenues and raising the land values in the vicinity."*(See map 1).

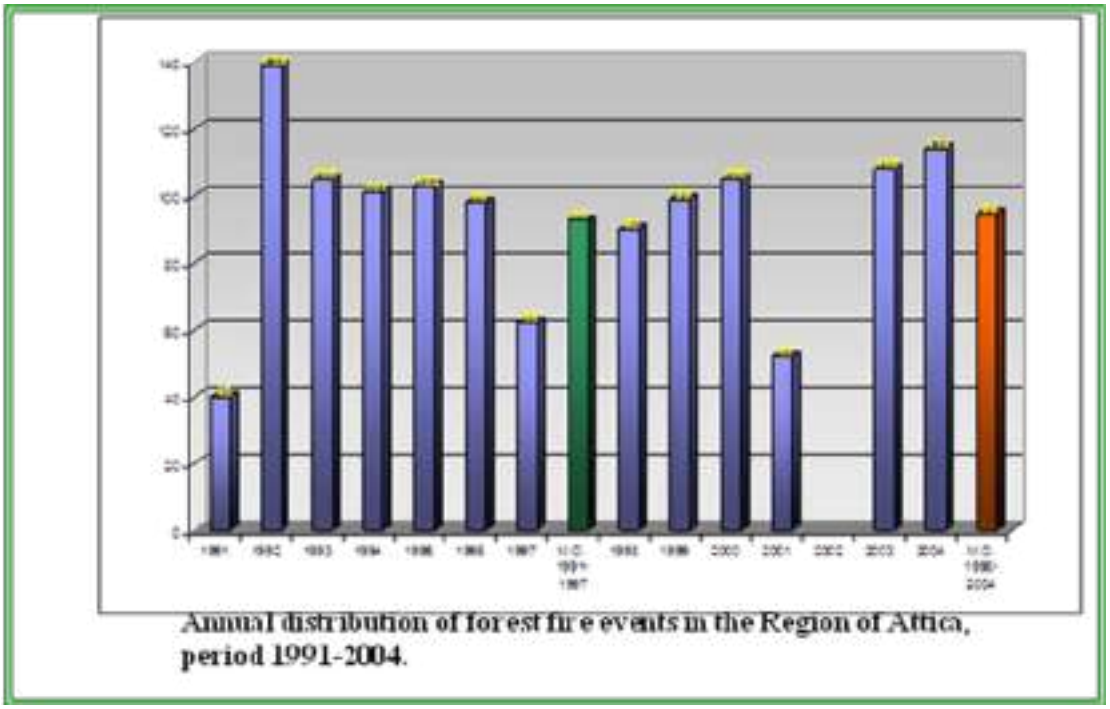


Figure 1. Distribution of the number of forest fire events of the Region of Attica to the years of the period 1991-2004. *Source: Kaoukis, 2009*

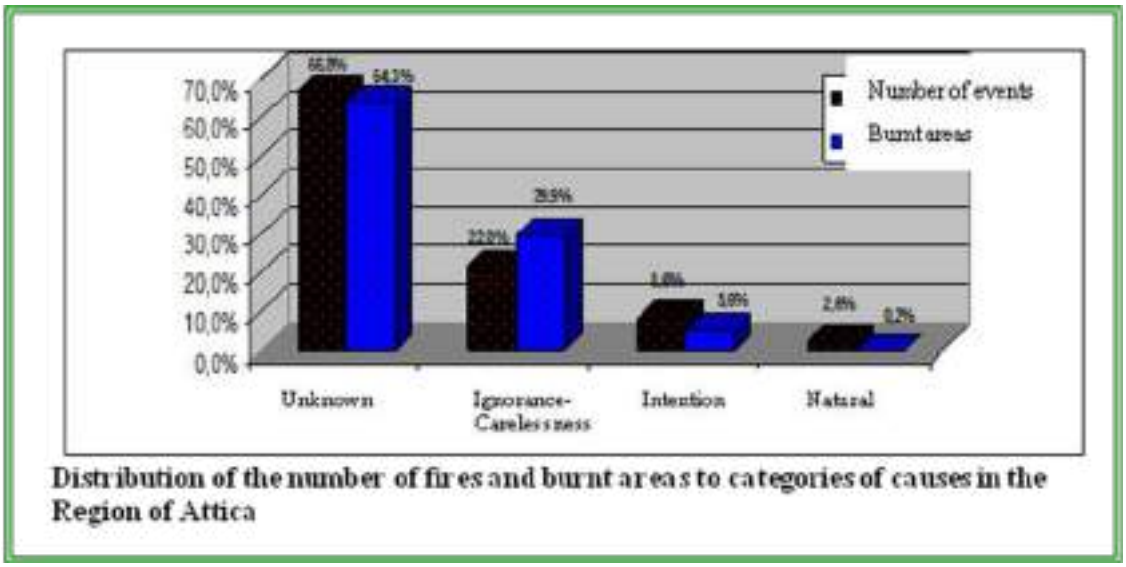
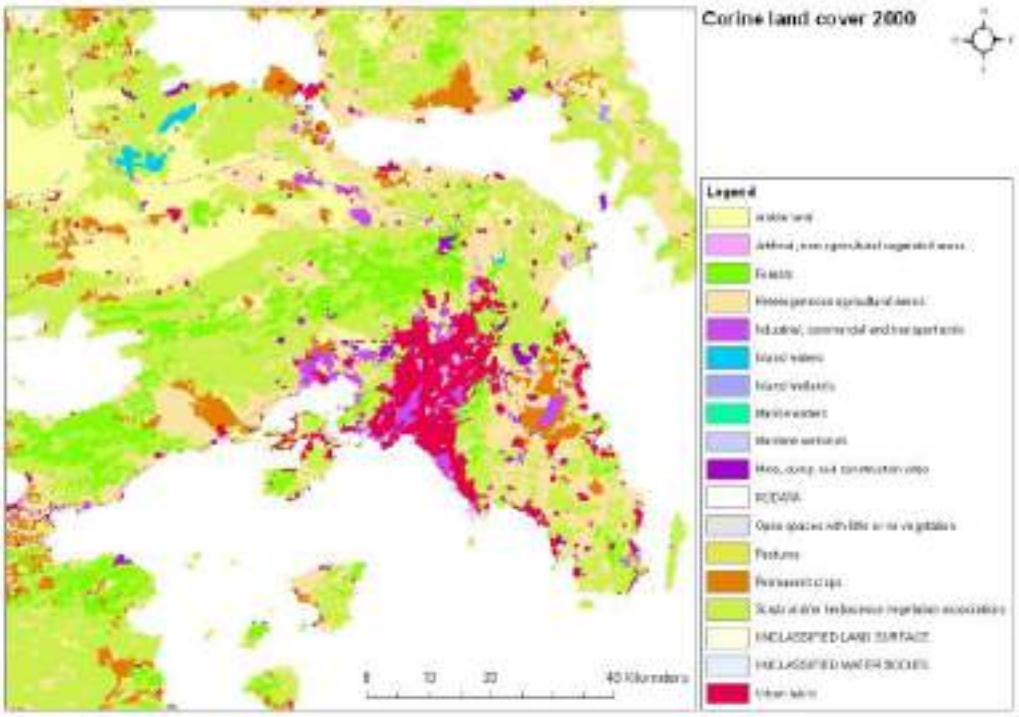


Figure 2. Distribution of the number of events and burnt areas of the Region of Attica to categories of causal origin, period 1991-2004. *Source: Kaoukis, 2009*



Map 1. The Athens urban complex and the satellite settlements in East Attica region. *Source: Corine Land Cover 2000*

3.2 Applying the Steps of the INCA Road Map model in East Attica Region toward the objective of Forest Fire Risk Mitigation

Selection of Eastern Attica region and its fire risk problem as the area and issue of concern and application constitutes the 1st Step of the INCA Road Map process (see diagram 1). In the next paragraphs the reader can follow the application of the subsequent Steps (2nd to 8th) and their results.

2nd Step: Creation and establishment of the Working Group (WG) for forest fire risk mitigation in Eastern Attica region.

After the initiative of academic and research institutions, namely the HUA and NAGREF teams-partners of the INCA European project a WG was established to deal with the overall objective of forest fire risk mitigation in Eastern Attica region. This consisted of:

- Representatives of the three involved Directorates of the Regional administration of Attica (Civil Protection, Spatial Planning and that of Forests of East Attica)
- Members of the research teams of HUA and NAGREF (INCA project partners)
- Representatives of the Municipalities of East Attica (local level)
- The heads of the four Forest Service Offices of East Attica (local level).

The WG was envisaged and planned to be as inclusive as possible in terms of the co-competent policy sectors and spatial scales / levels of administration.

3rd Step: Agreement on sub-objectives

During the four meetings of the WG and after intense discussion and some frictions between its members the latter arrived at an agreement on four sub-objectives (goals) to be consistently pursued by every member of the WG. These are:

- *Goal A*: Reduction of the number of forest fire events owing to negligence & ignorance causes.
- *Goal B*: Early detection of fire ignition points.
- *Goal C*: Intense search of the causal factors of the recorded as events of unknown origin.
- *Goal D*: Enhancement of prevention, preparedness and recovery by means of active participation of the Civil Society.

Agreement of the WG upon the above goals means commitment of each one of the partners to work for their accomplishment. It is worth noting that above goals are not independent from but interrelated with each other. Also worth-mentioning is the fact that the range of the greed goals extends over the whole RPPR chain (or risk management cycle) to ensure consistency and continuity among its successive phases.

4th Step: Agreement on mitigation measures

Out of the five measures that gained consensus among the participants of the WG three were actually implemented:

Measure I: Training of the school population (12-14 years old) on forest fire causal factors (including those related to human and physical geography) and self-protection and management issues. This was intended to serve simultaneously goals A and D.

Measure II: Assessing vulnerability and enhancing self-defense of residences versus fires (those in mixed forest residential areas) and creating a relevant geo-data basis. The measure was intended and planned to serve all four goals agreed upon in Step 3.

Measure III: Correction of contradictions, overlaps and/or ambiguities regarding competences of Spatial Planning, Civil Protection and Forest Service authorities as regards their impact on Forest Fire Risk. This measure has been envisaged so as to facilitate goals A, C and D.

Commitment of all participants to contribute to implementation of co-decided Measures is tightly connected to the multidisciplinary dimension of these Measures necessitating input from several fields and the respective WG members. An indicative example is the case of the measure of "Training seminars addressed to pupils". These seminars were implemented in two sessions where the first covered the spatial planning dimension of the catastrophic phenomenon[2] while the second focused on the foresters' and forest fire managers' point of view.

[2] Spatial planning dimension is relevant to the manmade causes owing to economic interests and human activity pressures on forest land, preventive measures related to the control of building development within and around forest land etc.

On the other hand “the spatial data basis for a mixed forest-residential territory” that was indeed realized in a hilly area within the jurisdiction of the Municipality of Kalyvia in Eastern Attica region is also a composite multi-dimensional Measure. The information that was collected includes data that are usable for both spatial planning preventive interventions (e.g. delineation of high risk and vulnerability zones where to impose building construction constraints and locate critical protective infrastructure) and pre-suppression and preparedness planning versus forest fires (e.g. localization of the weak points of the emergency road network etc). These of course are effective ways for rehabilitating synergies and cooperation between Civil Protection, Spatial Planning and Forest Policy to the end of Fire Risk Mitigation.

5th Step: Testing implementation processes and assessing final products
The Measure of the Training Seminars (I) and that of the Geo Data Basis referring to the vulnerability to fires of the building stock in the mixed forest-residential areas (Measure II) have been implemented at the local level (Municipality of Kalyvia in Eastern Attica region) while Mesure III focusing on the correction / demarcation of competences has been implemented at both regional and local levels.

The results after implementation of Measure I have been evaluated by means of questionnaires addressed to the pupils twice (an original version was submitted to the pupils before the Seminars and a copy of it after the Seminars) to allow evaluation of comprehension and assimilation by the pupils of the teaching material and respective messages. The statistical picture of the answers given to specific queries (of the questionnaire) before and after the Seminar on “Self-protection and Forest Fire Management” is offered in the following figures 3, 4, 5.

Map 2 below is indicative of the results after implementation of Measure II. It indicates the overall risk of destruction of houses possibly attributable to construction materials, location of the building, the slope, density and quality of vegetation that surrounds it, also the road leading to it.

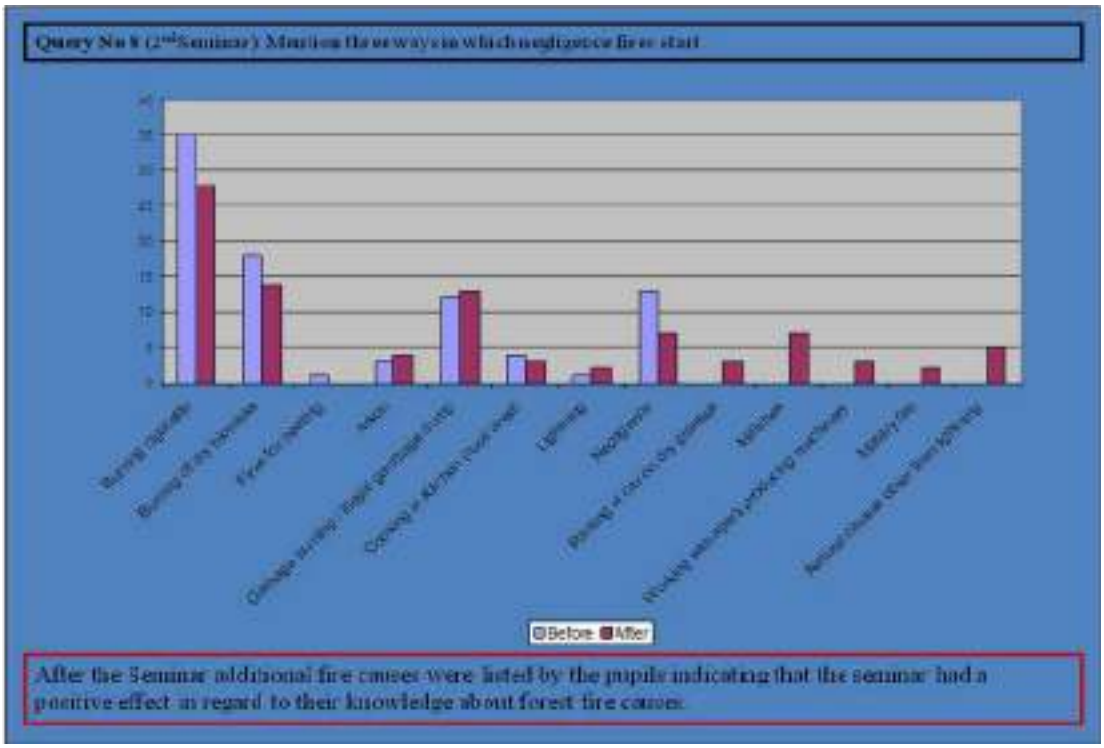


Figure 3. Comparison of pupils' answers to the query "Mention three ways in which negligence fires start" before and after the respective Seminar of the INCA project. *Source: INCA project 2011, Del. D2, Roussos A. and Xanthopoulos G.*

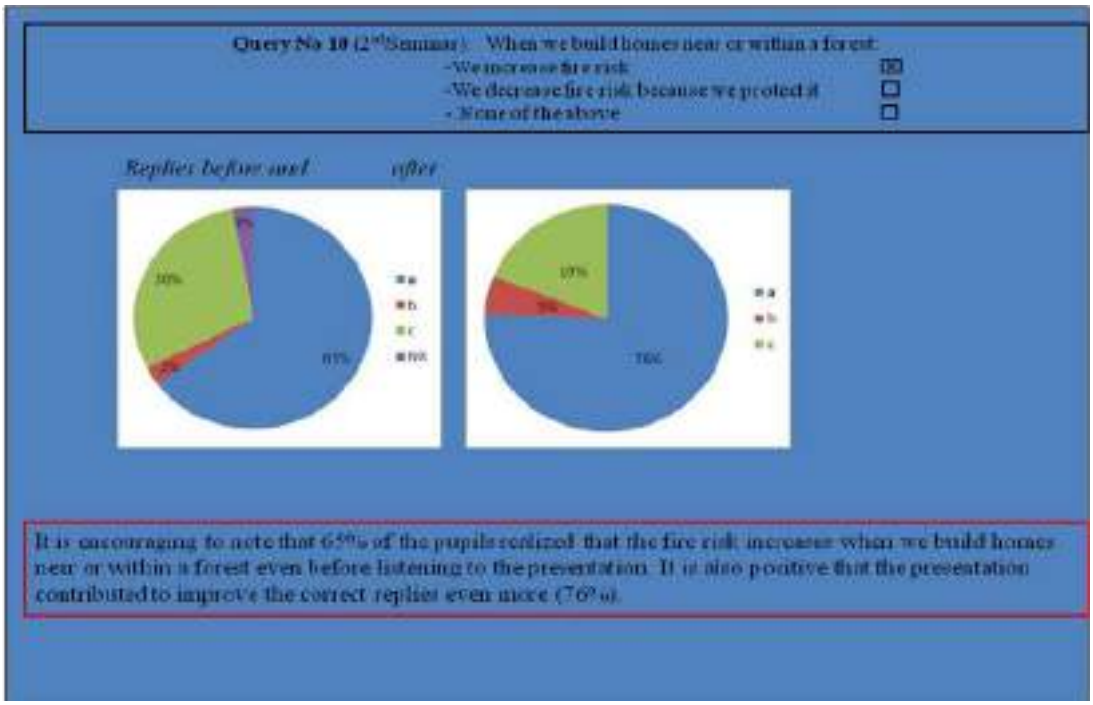


Figure 4. Comparison of pupils' answers to the query "What is the impact of buildings close to or within a forest?" before and after the respective Seminar. *Source: INCA project 2011, Del. D2, Roussos A. and Xanthopoulos G.*

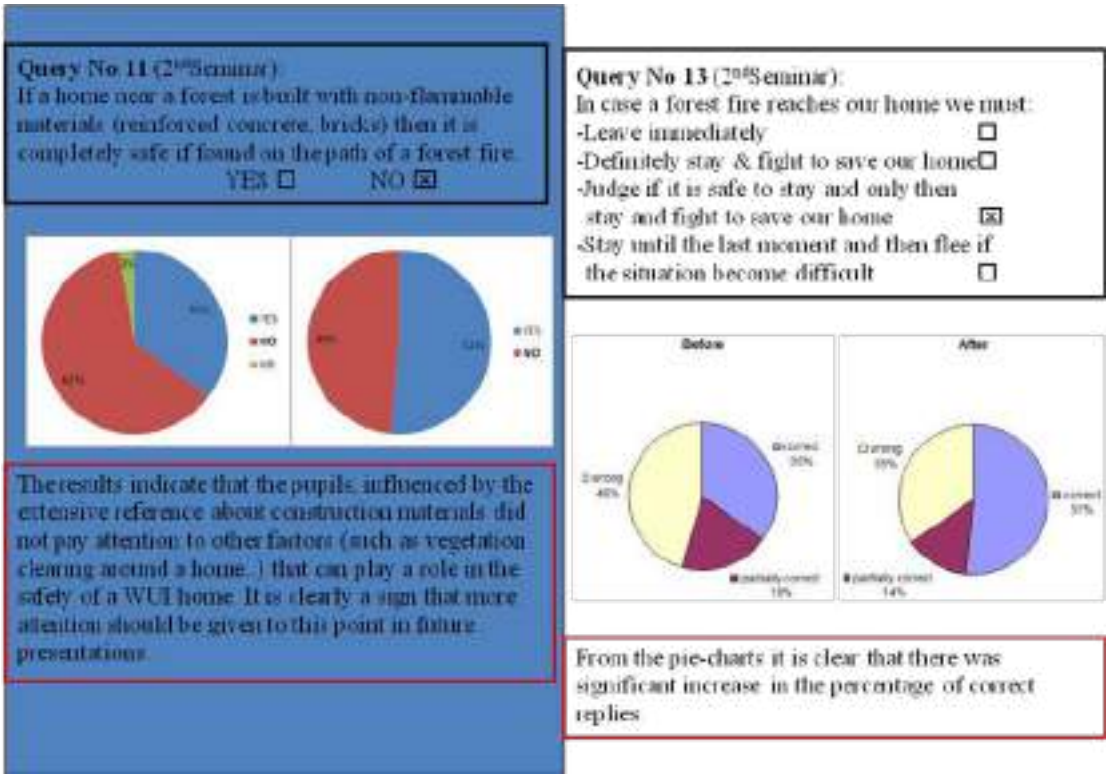


Figure 5. Comparing pupils' answers to queries regarding proper residence-defense and self-protection attitudes (before and after the respective Seminar). *Source: INCA project 2011, Del. D2, Roussos A. and Xanthopoulos G.*

Map 2. Houses and roads are coloured according to the total index (K) of risk of destruction of the building. *Source: INCA project 2011, Del. D2, Kalogirou S. Roussos A. and Xanthopoulos G.*

The statistical picture of the answers to the questionnaire submitted for completion to public officials (at the regional and municipal levels) asking them to address the effect of their own competences on forest fire risk (Measure III) is given in figures 6 and 7. The respondents have been selected to represent all primarily relevant policy fields: Spatial Planning, Civil Protection and Forest Policy. The aim of the questionnaire has been to increase consciousness of public officials regarding their possibility to influence forest fire risk (either in a positive or negative way) as well as clear delineation of competences and investigation of the prospects of cooperation. The questionnaire comprised a number of closed and open questions and the statistical sample amounted to 29 filled in questionnaires that were analyzed then by using methods of descriptive statistics and correlations.

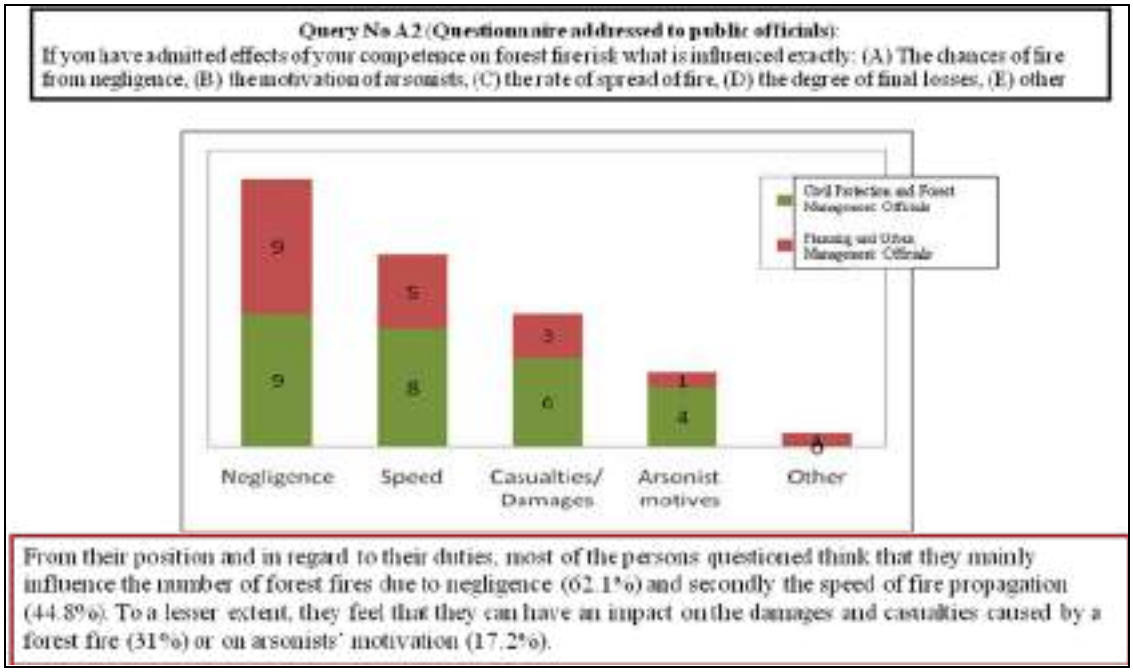


Figure 6. The public officials' answers to the query referring to the effects of their competence on forest fire risk. *Source: INCA project 2011, Del. D2, Sapountzaki K., Tragaki A. and Papachatzi A.*

6th and 7th Step: Indicators and measuring values reflecting the contributions of each partner and monitoring / controlling the achievements with respect to the envisaged goals.

The implemented measures serve the goals/sub- objectives that have been agreed upon by the WG as follows:

- Measure I (Training Seminars on Forest Fires directed to the school population of the Municipality of Kalyvia) contributes to the achievement of Goal A i.e. 'Reduction/Elimination of the number of fire events owing to negligence and ignorance causes' as well as Goal D (i.e. 'Enhancing participation of the Civil Society in forest fire prevention, preparedness and reforestation/rehabilitation processes')
- Measure II (Evaluation and Mapping of fire risk and vulnerability levels of buildings in the Out of Plan forest-residential areas of the Municipality of Kalyvia) establishes the prerequisite information basis for the successful pursuit of all four established Goals.
- Measure III (Submission of a questionnaire to public officials to address ignorance, uncertainties, contradictions and overlaps of public policy competences affecting forest fire risk) serves equally the Goals A, C and D (see 3rd Step).

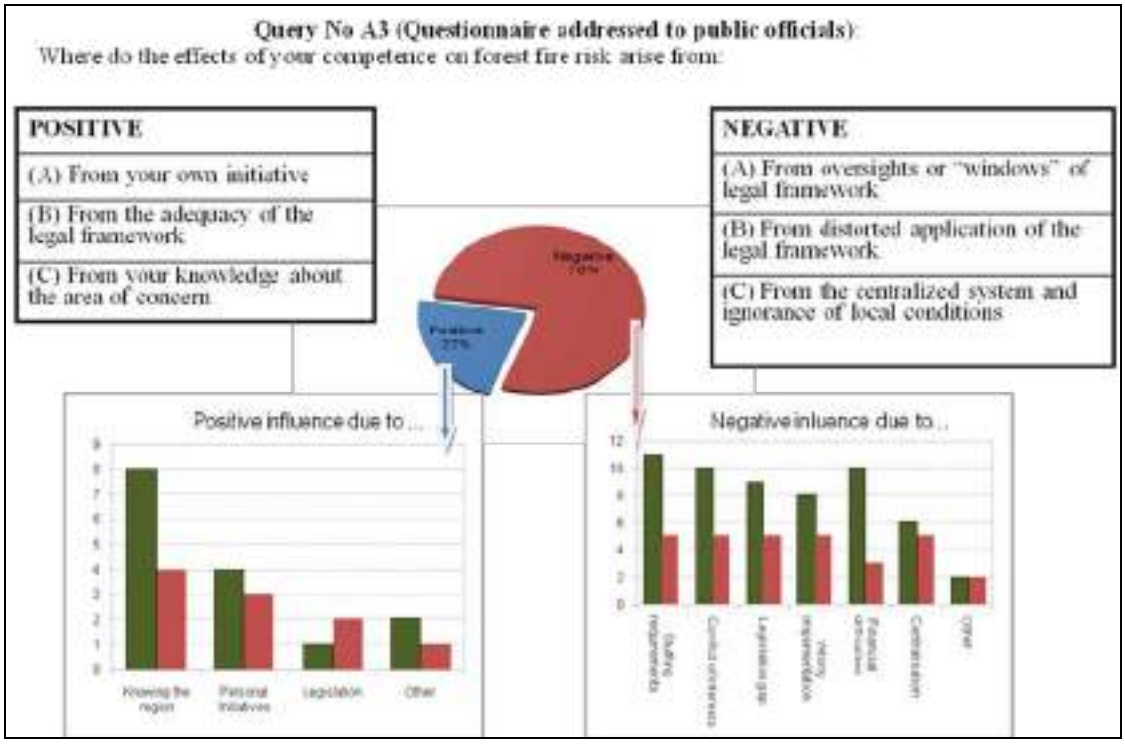


Figure 7. The public officials' answers to the query referring to the reasons behind the effects of their competence on forest fire risk. *Source: INCA project 2011, Del. D2, Sapountzaki K., Tragaki A. and Papachatzi A.*

Current steps of the road map process are preoccupied also with the degree to which the implemented measures fulfill the goals and whether all participants have contributed equally and cooperated with each other effectively. Appropriately planned and selected indicators and measuring values are the response to this challenge. More specifically the indicators that were constructed address:

- the contribution of each involved partner (input, i.e. own resources committed to the implementation of a measure)
- the effectiveness and efficiency of the implementation process with regard to the expected output and/or degree of achievement of the established goal/sub- objective
- the final outcome, i.e. the impact of the applied measure on the overall general objective of reduction of the forest fire risk in the area of concern.

Table 1 presents as an instructive example the monitoring indicators for Measure I (Training seminars on forest fire risk to be offered to school population). Figure 8 shows the estimation of measuring values and classification process for one specific indicator: "Sensitivity of pupils regarding forest fires and respective citizen responsibilities" both before and after the Seminars.

Table 1. Monitoring Indicators for Measure I (Training Seminars for School Population). *Source: INCA project 2011, Del. D2, Sapountzaki K.*

Steps / agents to be controlled	The element to be monitored	Monitoring Indicators
The Input of the involved partners (the Region of Attica, the respective Municipalities, the Research Institution)	Public Schools	Proportion of the Public Schools of the Region/Municipality joining the process of the training seminars (on annual basis)
	Public School- Teachers	Proportion of the school teachers (specialized in environmental education) adopting the measure on annual basis
	School Population	Proportion of the total school population of the Region/ Municipality attending the seminars on a yearly basis
	Academic- research manpower specialized in forest fire issues	Man- hours (on a yearly basis) of researchers (specialized in forest fires) devoted to the preparation of training material and analysis of questionnaires to address lessons learnt by the pupils
The effectiveness and efficiency of the training seminars (output)	Knowledge/ awareness of pupils and their families regarding forest fires	Mean knowledge/awareness indicators derived from answers to an appropriate group of queries (addressed to pupils by means of anonymous questionnaire)
	Sensitivity of pupils (and their families) regarding forest fires and citizen responsibilities	Mean **sensitivity indicators** derived from the answers of pupils to appropriate group of queries
The impact of training seminars on forest fire risk in the Region of Attica	Pupils' residences regarding exposure to forest fires as well as territorial exposure to forest fires of the wider area of East Attica	Proportion of pupils of which their families performed actions mitigating residential exposure
		Risk perception indicators of the pupils that attended the seminars
		Exposure levels of the Out- of-Plan mixed forest- residential areas of east Attica (on the basis of long- term horizons)

Sensitivity Scores are estimated by combining scores attributed to the answers of the following queries of the 1st Questionnaire:

5. What feelings are created to you by forest fires?
19. Do you prefer your residence to be located (A) inside the forest, (B) inside a city or settlement?
20. Would you change your answer above if you were sure that a building in the forest increases the danger of forest fire or of your house to be burnt?

	Before the Seminar	After the Seminar
-5 to 0	4 (10%)	5 (12%)
0 to 5	17 (41%)	12 (29%)
5 to 10	18 (44%)	22 (54%)
10 to 15	1 (2%)	2 (4%)
15 -20	1 (2%)	0 (0%)

Sensitivity scores:
Frequencies and relative frequencies

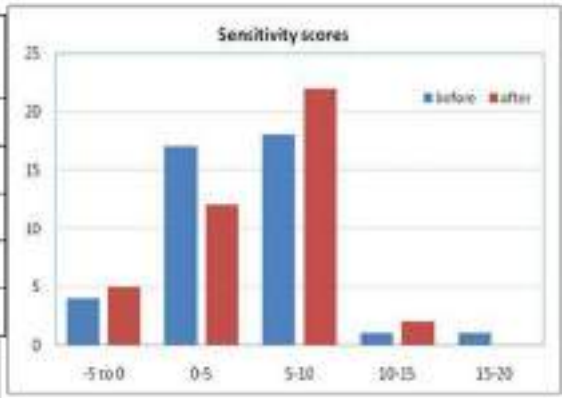


Figure 8. Estimation and classification of measuring values of the indicator "Sensitivity of Pupils versus forest fires" before and after attending an informative Seminar. *Source: INCA project 2011, Del. D2, Sapountzaki K., Tragaki A. and Papachatzi A.*

8th Step: Feedback

The feedback possibility has been employed several times during the INCA Road Map process. First, for the enlargement of the initially established WG (after the 3rd Step) so as to include additionally involved stakeholders (i.e. competent Municipalities, the heads of the Forest Service Offices –FSOs- in the Eastern Attica area etc).

Feedback has also been performed at the 6th Step when it was decided that implementation of measures should start as a pilot case at the local (Municipality) level and not the regional level; also that it should be undertaken firstly by an active Local Authority Organization (the Kalyvia Municipality) and should be performed as a trial case of limited scope (the seminars were conducted for a sample of the school population of Kalyvia and the Geo-data basis was created for only a small hilly forest-residential area falling in the jurisdiction of the Municipality of Kalyvia.

Feedback has been used in several other circumstances and should continue to be employed in the future if the refinement and standardization of the Road Map process is pursued.

4. Conclusions

The results of the pilot application of the INCA Road Map model in the Eastern Attica region and more specifically in the area of the Municipality of Kalyvia proved to be impressive. Without spending even one euro the Municipality by following the process managed to: (a) obtain a valuable Geo-data information basis on the variations of risk of destruction and building vulnerability in a section of its forest-residential areas and (b) organize Seminars for pupils and disseminate useful information to the wider Kalyvia community on forest fire prevention, protection and management.

The INCA Road Map model for risk mitigation represents a radical change and innovation in relation to the rigid political / administrative systems and a significant deviation from the established norms of administrative processes. This is true for even centralized, like the Greek, systems of policy-making.

The INCA Road Map model promotes actually risk management processes that are adjusted to the risk generating conditions; on the contrary conventional management solutions are reflections of administrations' structures, constraints and possibilities. Hence, viability of the model is at the hands of regional and local administrations which have to follow visions and be committed to the matter of risk abatement, environmental protection and public safety rather than retain their introversion and insularism.

The success of application of the model in the case of Eastern Attica region facing the standing and increasing risk of forest fires in its mixed forest-residential areas was due to the following appropriately reflexive and feedback decisions/ actions:

- Enlargement of the initially formulated WG so as to embrace crucial but non-formal actors and agents (members of NGOs, public officials carrying simultaneously the status of a researcher, representatives of voluntary citizen groups, officials with prior experience in organizing drills and in training volunteers, persons at key-posts which INCA members kept personal friendship contacts with etc.)
- Involvement in the working group of a Local Authority to undertake the mission of measures' implementation. The LA level is indeed the most flexible level of administration, the closer to the Civil Society and the easiest in adopting and assimilating novel, innovative processes which are usually ejected by the state's bureaucracy.
- The measures have been opted so that their application would not necessitate extra financial resources. This was possible due to the employment of voluntary citizen groups and utilization of a University's and Research Institution's infrastructure (software and hardware). Should implementation necessitate extra funding it would not ever be realized.

The process of application revealed that a knowledge intensive institution is a necessity and a precondition for success. Such an institution is out of the internal conflicts of the administration pyramid, it enjoys (to a certain degree) credibility and trust, it is acceptable as negotiator and it is the only agent that can refute the consolidated, backward and rigid mentalities strung along with bureaucracies.
In any case the successful application of the measures is only provisional and temporary. No question, the measures have not been embedded in the routine process of the Regional or Local Authorities. Indeed, there is a long distance to cover before achieving such an end but the pilot case application has opened the way.

5. References

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