

4.Aspects of resilience in the reconstruction of Kalamata (Greece) after the earthquake disaster of 1986

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Abstract

The paper discusses the case the reconstruction of Kalamata city, Greece, after the 1986 earthquake disaster, focussing on urban resilience during the phases of response, recovery and reconstruction. In doing so, it revisits the concept of resilience as an analytical and policy tool.

A set of factors are identified as significant for the success of the reconstruction. The political and economic context in the country at the time was favourable to innovative strategies. At a local level, strong leadership at the Municipality played an important role together with the availability of external expertise and consultancy. Furthermore, the fact that a new and comprehensive general urban plan was in place a few months before made possible the key decision to set it as a guide towards reconstruction.

Numerous features of resilience are detected in this specific case, among them leadership, self-organization, innovation, knowledge and learning capacity, networking and trust, interaction between different spatial and time scales. However, if those signify at large a resilient city against disasters remains questionable.

Introduction

Resilience has earned a predominant place in a range of fields such as environmental studies, planning, psychology and economics and is seen even as a buzzword (DAVOUDI et al. 2012). The concept is utilised widely and extensively also in disaster risk reduction and climate change adaptation.

Scholars identify a range of essential qualities in resilience, among them robustness, redundancy, diversity, efficiency, autonomy, interdependence, speed in recovery, reflectivity, variability, connectivity, pluralism, to name just a few. For example, FOLKE (2006) studying social–ecological resilience pinpoints adaptive capacity, transformability, learning, innovation. GODCHALK (2003) referring to resilience in respect to planning points towards diversity, redundancy, resistance, flexibility, ability to collaborate, interdependence, autonomy, efficiency. In a similar vein, CHUVARAJAN et al. (2006), as referred by SAPOUNTZAKI and DANDOULAKI (2016), examining sustainability at a local level identify diversity, redundancy, self-organization, memory, networking, innovation, interaction between different spatial and time scales, feedback, self-sufficiency. To close, *100 Resilient Cities* initiative sees reflectiveness, resourcefulness, robustness, redundancy, flexibility, inclusiveness and integration as the seven main qualities of resilient cities.

In the field of urban planning and cities, resilience was raised from a theoretical construction to a vision and even became a regulatory tool. Together, the resilience of city in respect to disasters is studied (VALE and CAMPANELA 2005). In an effort to enhance resilience of cities while keeping up with the five priorities adopted by *Hyogo Action Framework 2005-2015*, UNISDR has drawn up Ten Essentials for Making Cities Resilient (Box 1).

In spite of its prevalence in current discourses, the concept of resilience still lacks precision and clarity and remains elusive (SAPOUNTZAKI AND DANDOULAKI 2016). Moreover, critical voices argue that resilience as a policy instrument promotes neoliberal positions and shifts responsibility for risk reduction and management from the state to individuals and the society (LENTZOS KAI ROSE 2009, O' MALLEY 2012). SAPOUNTZAKI (2012) claims that resilience to risks is based on „a management system of the vulnerability“; each body is developing itself adaptability to reduce its own vulnerability and in doing so affects intentionally or unwittingly the vulnerability of others.

Essential One: Organise for Disaster Resilience
Essential Two: Identify, Understand and Use Current and Future Risk Scenarios
Essential Three: Strengthen Financial Capacity for Resilience
Essential Four: Pursue Resilient Urban Development and Design
Essential Five: Safeguard Natural Buffers to Enhance Ecosystems' Protective Functions
Essential Six: Strengthen Institutional Capacity for Resilience
Essential Seven: Understand and Strengthen Societal Capacity for Resilience
Essential Eight: Increase Infrastructure Resilience
Essential Nine: Ensure Effective Disaster Response
Essential Ten: Expedite Recovery and Build Back Better

Box 1: The Ten Essentials for Making Cities Resilient Source: <http://www.unisdr.org/campaign/resilientcities/toolkit/essentials>

GAILLARD and JIGYASU (2016) examining diverse approaches for measuring resilience to natural and other hazards raise the question whether “contemporary frantic quest for enhancing measurements of resilience may ... constitute neither more nor less than the perpetuation of the dominant hazard paradigm and its neo-colonial agenda”.

Given the wide range of approaches to resilience, evaluating the expected beneficial effects of resilience in vulnerability and risk is a challenge and requires deciphering the process of social adaptation. To this end, SAPOUNTZAKI and DANDOULAKI (2016) propose the examination of the following key factors and process steps:

- the subject or system that is developing the process,
- motivation or initiation of the process,
- the resources deployed and the ways in which their adjustment is made,
- the spatial scales and the time span of the process,
- the end result, that is the consequences for risk and vulnerability on the subject itself but also on other subjects or systems.

In this Chapter we discuss the reconstruction of Kalamata city in Greece after the 1986 earthquake disaster and attempt to identify elements of urban resilience during the response, recovery and reconstruction phases. In doing so, we revisit the concept of resilience as an analytical and policy tool.

The case of Kalamata was selected because it is considered a success case and a benchmark and because it highly influenced disaster management policies and practices in Greece in the following decades.

*Response to
Kalamata
earthquake
disaster of
1986*

The context and the city before the earthquake

Kalamata is a provincial urban centre in the southern coastline of Peloponnese (Map 1) and the capital of Messinia prefecture. According to the last population census before the disaster, the population was about 42.000 inhabitants. The city obtained all the typical characteristics of the Greek mode of urban development at the time: unplanned, disorderly expansion of towns and extensive illegal housing construction (SAPOUNZAKI and DANDOULAKI 2006). In the city centre densities were high. The infrastructure (sewage system, water system, waste treatment) was inadequate. Its economy was based mainly on services, agriculture and agro-industry. The city suffered from economic stagnation, in spite of its rich tourist resources and the fact that agriculture and agro-industry was a driving force of local development even before the WW2. It should be noted though that many infrastructure projects and social facilities for the city were foreseen in the *Regional Plan of Economic and Social Development 1983-1987*.



Map 1. Location of Kalamata

In the mid-80s, the Municipality of Kalamata had a strong leadership with a clear a vision for the city encompassing social and cultural development and public participation. Moreover, the Municipality was engaged in many activities and had accumulated sufficient human and material resources. It is indicative that the Municipality of Kalamata was staffed with about 235 people, the Municipal Enterprise of Water and Sewage of Kalamata with about 120 people and the Municipal Cultural Enterprise of Kalamata with 65 people (OASP 1987a).

About 5 months before the disaster, the General City Plan of Kalamata (Map 2) was published in the Government Gazette ending decades of planning efforts. The General Plan proposed a change of the structure of the city, allowed for a generous expansion of the city and was comprehensive in considering spatial, social and economic aspects.

At a national level, the earthquake disaster occurred when earthquake protection was recognised as a priority for the country (DANDOULAKI 2007). Earthquake Planning and Protection Organisation (OASP) had already been established and the Transitional Earthquake Emergency Plan „Xenocrates - Earthquakes“ had come into force in 1984. In 1984, the Seismic Design Code of 1959 was amended so as be adjusted to reinforced concrete buildings. A proven institutional framework for the rehabilitation of earthquake-damaged buildings and infrastructure was in place after the earthquake disaster in Thessaloniki in 1978.

Earthquake consequences and emergency response

On Saturday, September 13, 1986 at 20:24 hours local time an earthquake of surface wave magnitude 6.0R hit Kalamata city. The earthquake was felt at great distances (Patras, Loutraki, Athens), but damaged mainly the city of Kalamata and surrounding areas. The strongest aftershock of $M_s=5.4R$ occurred on 15th September at 14:41.

Twenty people (2 during the main aftershock) were killed and 330 injured (OASP 1996), while 15 people were rescued from the ruins. Many roads were blocked from debris and power was cut due to damages to power lines. The earthquake occurred on a hot afternoon in September when most people were outdoors and an estimated number of 15,000 people were on the harbour for the inauguration of a new ferryboat line, this significantly redu-

cing the number of victims (IOANNIDES and DIKEOULAKOS 2001).

The spontaneous reaction of the population was to evacuate the buildings and escape to open air as fast as possible. Thousands of people used their cars to escape from the city causing huge traffic jams. However, the panic faded away quite quickly and many residents returned to the city. This changed after the aftershock on September 15th when the uproar of the earthquake and the dust from collapsing buildings triggered severe panic the mass escape of population from the city.

In the disaster area, out of about 9,800 buildings inspected for damages, only 33% were classified in the categories *without any damage* or *with light damage*, while approximately 22% were considered as *damaged beyond repair* and 21% *seriously damaged* (IOANNIDES and DIKEOULAKOS 2001). Seven reinforced concrete buildings collapsed.

Regarding school buildings, about 70% of them were classified as *seriously damaged* or *damaged beyond repair*. Overall, half of public buildings were damaged. Masonry buildings, among them traditional and historic buildings and monuments were devastated. Out of the 200 buildings considered eligible to acquire a preservation status, according to a study of the Municipality of Kalamata, only 100 survived. The spatial distribution of damage varied significantly. In the old part of the city 60-70% of the building suffered serious damage or worst, while damage was significantly lower by the coast.

The direct economic impact in the earthquake-stricken area was high. More than 70% of buildings in the centre of the city, where businesses was concentrated, were damaged. The tourist infrastructure was severely hit and 11 hotels were classified as *damaged beyond repair*.

During the first hours after the earthquake, mainly local first responders were mobilised. Later, all local public agencies were involved along with national services and international rescue and aid teams. The Municipality was activated immediately after the earthquake although it had no institutional role in emergency management. The Mayor, municipal councillors and employees of the Municipality gathered at the Municipal Refectory, opposite the City Hall. In the first hours, priorities were the psychological encouragement of the population and a first assessment of the situation (OASP 1987a).

In the chaotic early post-earthquake situati-

on, many pressing and urgent needs arose while the priorities were difficult to set within conditions of confusion and lack of coordination between the various players.

The Offices of the Prefecture and the Town Hall were seriously damaged, so their services had to operate outdoors. Gradually, all services were relocated in emergency shelter. On order of the Head of the Prefecture, the Coordinating Prefectural Board convened.

The Municipal Coordination Committee convened and decided to set up Committees to support the activities of the Municipality (OASP 1987a). These committees (Box 2) reveal the scope of the role of the Municipality in the harsh post-disaster conditions.

■ Urban Planning Committee ■ Emergency Relocation Committee ■ School Programming and Social Welfare Committee ■ Demolition, Roofing and Debris Clearing Committee ■ Committee of Temporary Housing ■ Committee for Monitoring the Action of other Entities ■ Committee of Cultural Heritage and Buildings under Preservation ■ Committee to Support Camps ■ Logistics Committee ■ Committee on Electric Power of Camps ■ Donations Management Committee ■ Information Committee and Press Office

Box 2: Committees and areas of action of the Municipality of Kalamata during the emergency period following the earthquakes of Kalamata in 1986 (Source: OASP 1987a)

The activities of the Municipality were taking place all over the disaster area concurrently and urgently. With its fast reaction the Municipality conquered from the beginning a leading role in disaster management.

In the following, emergency activities relevant to urban resilience are presented in more detail.

Emergency shelter

The intense seismic activity and the instruction to the population not to use the buildings, even those without damage, led to huge needs in shelter for virtually all residents (about 35,000 people) (IOANNIDES and DIKEOULAKOS 2001). Tents, cruise ships and private means (caravans, vans etc.) were used.

About 400 families selected by the Municipality based on specific criteria took shelter on cruise ships for a few weeks, while about 1,000 people were sheltered on a cruise ship for two years. Around 9,000 tents were distributed to individuals by the Municipality of Kalamata while affected families formed spontaneously small-scale camps.

After the first week, the emergency response mechanism decided to set up organized camps. Organized camps were a challenge both in terms of construction and of management. The construction of infrastructure (installation of tents, water supply, sanitation, power provision, telephone connections etc.) and the provision of services (garbage collection, medical care, psychological support, entertainment, food preparation, clothing, childcare etc.) required the coordination of many services and agencies in harsh conditions. Each camp had a responsible officer and team leaders, whereas ad hoc residents' committees were formed and camp assemblies convened.

Initially, the plan was that the tents would stay for three months. However, around 5,000 people were still living in tents six months after the earthquake (OASP 1987b). The tents were removed one year after the earthquake on the initiative of the Prefecture of Messinia.

Emergency demolition of damaged buildings

The demolition of some 3,000 buildings located all over the city was a huge task and an urgent one, because of the imminent danger of collapse. Even more, control over demolitions prevented the demolition of damaged historic or under preservation status buildings. The task was undertaken by the Municipality and began immediately after the earthquake.

Paving the way towards reconstruction

From the very first days after the earthquake, while survival of the population was the prime concern, the procedures for the establishment of a reconstruction strategy and of a medium and long-term reconstruction plan began.

On 23/9/1986, a plan of immediate actions was completed with the cooperation of the Ministry of Environment, Physical Planning and Public Works, the Municipality of Kalamata and a team of urban planners who were voluntarily offering consultancy to the Municipality. A week later, the Municipality handed over to the National Representative at the then EEC a memorandum stating the necessity of a program of assistance from the EEC for „immediate“ needs. A month later, the Municipality presented the “Program for the Reconstruction of the City” in a high-level meeting with the Ministry of National Economy. By mid- December, EEC

decided for initial funding of immediate post-disaster actions.

Moreover, as early as 23/09/1986 the Municipal Council decided to issue the pending decrees for the expansion of the city as soon as possible and to urgently review the Plan in order to take into account the new post-earthquake situation and the early results of a micro-zonation study commissioned after the disaster. At the end, this revision brought no substantial changes to the initial Plans (DIAMANTOPOULOS 1991).

It should be stressed that this long-term outlook is not usual and was facilitated, or even made possible, by the early decision to set the new statutory urban plan as the guide towards reconstruction. A map of the proposed location of emergency camps completed a week after the earthquake, demonstrates that the Urban Plan of Kalamata was already used as a basis.

Maintaining a long-term viewpoint towards reconstruction in the mist of the crisis and resisting “rush to rebuild”, was not habitual or inconsequential; it even brought friction between the Municipality and the central administration and protests from the local population.

The emergency phase lasted for about 40 days. Gradually life in the city began to take its normal course. The population started to use to the non- damaged building. Stores that had not suffered serious damage went back to business. Provision of free meals stopped. The roads were cleared from the ruins. City started to function more normally again, although mostly in emergency or temporary shelters. Industries and many crafts had resumed operation. After a long emergency period, the rehabilitation began and the main challenges ahead were the restoration of the housing and the revival of economic and social life.

Towards reconstruction in three stages

In respect to rehabilitation of damaged buildings, the following goals were set:

- To restore the building stock both in terms of quantity and of quality, at least to pre-earthquake levels
- To support financially and technically the owners of damaged buildings in order to repair or reconstruct their dwelling and to introduce measures for increasing seismic safety of buildings
- To provide social housing through organized construction and self-housing

Going beyond rehabilitation, the comprehensive reconstruction strategy that was developed was structured around the following complementary goals.

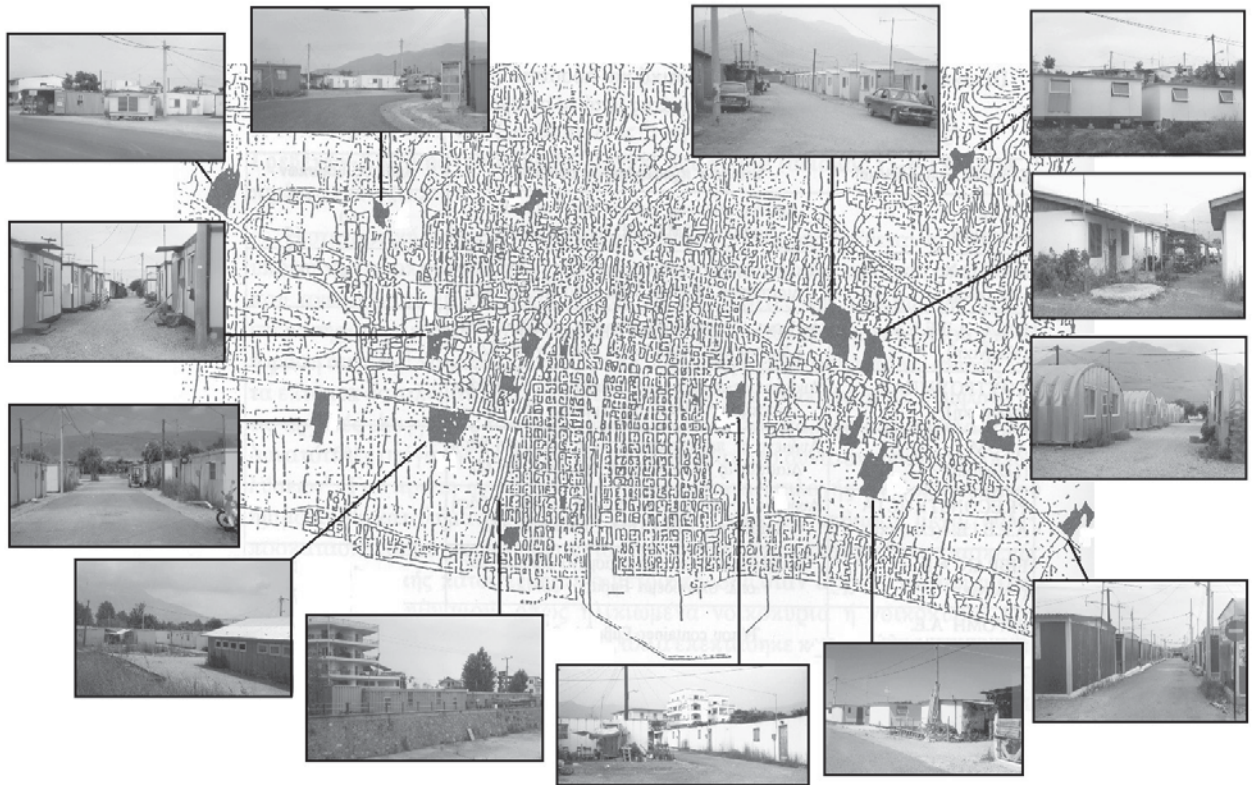
Implementation of the General Urban Plan of Kalamata and advancing urban planning: revision and implementation of the General City Plan, formalisation and implementation of plans for the expansion of the city

Housing rehabilitation: repair of damaged buildings (private and public), demolition and reconstruction of demolished buildings, measures to stimulate building activity and social housing programs, adoption of codes, rules and recommendations to increase seismic safety of new or repaired buildings and public works.

Preservation of the city's morphology: rehabilitation of monuments and historic buildings, preservation of the morphology of significant buildings and ensembles, preservation of the historical centre of the city, protecting the morphology of the area around the Castle

Stimulation of the economy and social welfare of the region: a range of benefits, incentives and low-interest loans were given to professionals and businesses in the area, additional measures have been taken to strengthen the local market.

To implement this visionary reconstruction, however, it was necessary to gain time and release pressures to build back as soon as possible. To this end, soon after the disaster it was decided to launch a scheme of temporary shelter in transportable or prefabricated dwellings (DANDOULAKI 1992). Twenty two housing settlements with around 3.000 transportable or prefabricated dwellings (Map 2) were constructed, as well as 4 commercial centres with 280 temporary units and 10 schools with 200 temporary classrooms. Most temporary settlements were located in areas of the city where urban expansion was planned so that new infrastructure could be of use of the city after the settlements would be dismantled.



Map 2: Location of temporary settlements in the city of Kalamata city after the 1986 earthquake disaster
(Source: M. DANDOULAKI, 2008)

The reconstruction of Kalamata marked a turning point in earthquake policy of the country and became a reference case (IoANNIDES and DIKEOULAKOS 2001). Its legacy is the notion that a seismic disaster is not only or even mainly about buildings but may generate economic and social development; therefore, it is not exclusively an engineering issue and requires a multidisciplinary approach and, also, a long term outlook towards the future of the city even in the midst of the harsh emergency period.

The reconstruction largely achieved its objectives (DANDOULAKI 2008). A first significant outcome was the implementation of the Urban Plans and the construction of the urban infrastructure and facilities that the Plan had foreseen. For instance, a park in the city centre took shape, the East and the West centres in the expansion areas of the city were developed and the transport network was improved. New economic, social, cultural and environmental infrastructure such as a marina, a courthouse, a market, an industrial park for SMEs, a waste purification and compost treatment plant, was constructed. The city's morphology was maintained through the protection of the identity of the area around the Castle and of the city centre and the restoration and reuse of historic and listed buildings.

Viewing the reconstruction of Kalamata a posteriori

Moreover, seismic safety of buildings was upgraded by introducing new seismic design specifications.

Even so, Kalamata's reconstruction had its weaknesses and failures (DANDOULAKI 2008). Temporary housing remained for 10 years, far more than the two years originally planned. In spite of the urban plan and the generous extensions of the urban area, urban sprawl was not avoided (Map 3). The commercial centres created at the Eastern and Western Centre of the city extensions were not successful and gradually declined. The ring road that was considered as an essential element of the new structure of the city was not completed before 2016.



Central areas are marked in “Dk up diagonal”, the urban area according to the Urban Plan of 1905 is marked in “Lt trellis” and the expansion areas according to the General Urban Plan of 1986 are marked in “Lt Grid” (lighter gray).

Map 3: The urban area according to the General Urban Plan of Kalamata of 1986 and urban sprawl in 2007

(Source: M. DANDOULAKI, 2008)

Still, the reconstruction of Kalamata is a reference case and a good practice. As an indication, the city has been awarded a price by the EU for its reconstruction.

The successful reconstruction was an outcome of a whole set of factors. First, when the Kalamata disaster occurred seismic pro-

tection had already become a national priority. The establishment of Earthquake Planning and Protection Organisation (OASP) in 1983 after a unanimous decision of the Greek Parliament demonstrated the emergence of seismic protection as a central issue in the national policy agenda. The newly established OASP had a multidisciplinary orientation and advanced seismic protection in Greece taking into account the international trends in this field. A new National Earthquake Emergency Plan was in place. However, there was no institutional role for Municipalities in disaster management at the time and emergency management was entirely in the responsibility of Ministries and Prefectures.

Moreover, locally there was a strong leadership in the Municipality of Kalamata and the Mayor had built networks with the central government and held sufficient human resources and means and was actively engaged many fields such as infrastructure construction and culture.

The fact that the new General Urban Plan was published in the Government Gazette a few months before the earthquake was a positive coincidence. More significantly, the plan comprehensively combined spatial, social and developmental goals.

The urban planners from the private firm that was developing the urban plans for the city had begun its cooperation with the Municipality as early as in 1978. The same team placed itself next to the Mayor from the first hours after the disaster and voluntarily offered its assistance and consultancy. The importance of the scientific and technical consultancy at the time of the crisis proved to be essential in maintaining the long run view and the spatial outlook even in the mist of urgency and pressure.

The disaster was huge and struck mainly the city of Kalamata. The Municipality of Kalamata played a leading role in managing the disaster over and above its institutional role. The Municipality was even able to guide the rehabilitation and reconstruction of the city, setting the base for this in decisions taken during the pressing and demanding emergency phase. Having built networks, trust and knowhow before the earthquake, the Municipality with the support of the central government managed to find the financial and other resources required for implementing a visionary reconstruction.

However, the reconstruction of Kalamata constitutes an exceptional best case in Greece. The window of op-

portunity arising from the disaster and the devastation for a short time was used at a local level in order to advance urban development and sustainability. Although, many efforts of Greece cities to recover from following disasters have been influenced by this reference case, there is no example of such comprehensive successful reconstruction. Then again, the earthquake disaster of Kalamata constitutes a turning point in the earthquake policy of the country as it influenced the management of subsequent disasters. It was an opportunity to test and introduce new procedures, tools and mechanisms for dealing with disasters, to create knowhow and left a positive point of reference. Overall, it enhanced the institutional capacity of the country to deal with disasters and crises.

*Discussing
resilience in
the case of
Kalamata
disaster*

Reading the case of the reconstruction of Kalamata city after the 1986 earthquake disaster through the lenses of resilience is a trying exercise. A successful reconstruction in terms of reducing earthquake risk and enhancing urban, social and economic development denotes by definition a resilient city; on the other hand, the destruction and severe damages that the city suffered show low resilience. Therefore, setting a timeframe in assessing resilience seems important for the outcome of the assessment. Even so, it is practically impossible to distinct developmental resilience from disaster resilience 30 years after the disaster.

When examining the immediate and meso-phases, what constitutes an aspect of resilience is the exceptional role of the Municipality that overcame institutional barriers and gained a leading role in the critical post-disaster period. Accommodation of the Municipality within the emergency response and recovery system, no matter the occasional frictions with the central government and the Prefecture, demonstrates a certain flexibility and transformability of the formal institutional system. This was facilitated by the previous networking and trust built between the Mayor and Ministers within the political circumstances at the time.

In dealing with the disaster, self-organization, innovation, knowledge and learning capacity were evident throughout the period from emergency response to reconstruction. New schemes were created in order to deal with the situation; a temporary shelter scheme, a scheme for the organization of emergency camps, a scheme for the demolition of buildings damaged beyond repair, a scheme for finding and allocating

founding. The role of the Municipality from emergency response throughout reconstruction was itself an outcome of innovation and self-organisation, as there was no institutional outline of its responsibilities and tasks in disaster management.

Strong interaction between different spatial and time scales was present and noticeable. A long-term outlook was maintained from the first days of the disaster and measures to release “rush to rebuild” were anticipated early in the emergency phase. Ability to collaborate was demonstrated as national, regional and local level entities worked together in dealing with the situation. Moreover, the informal yet close collaboration of the Municipality with the urban planning firm that had elaborated the urban plan of the city, proved highly significant for enabling the Municipality to maintain a long-term outlook towards a comprehensive reconstruction.

Moreover, the economic and political context in the country was accommodating for a visionary reconstruction. With Greece in the EEC and a political era promoting “change”, forward thinking and seeking comprehensive solutions did not seem outlandish. Nonetheless, the new approach to reconstruction was not automatically and effortlessly introduced.

Examining the broad picture, what is noticeable is how good practices from Kalamata were defused into earthquake policies and practices and effect earthquake protection in Greece up to nowadays (DANDOULAKI, 2007). Changes were introduced in the institutional framework and emergency plans and know-how on a number of issues (USAR, emergency propping and removal of dangerous elements, usability and damage inspection of buildings) was spread (IOANNIDES and DIKEOULAKOS 2001). Learning capacity, memory and knowledge proved to be key elements for upgrading the country’s resilience to earthquakes.

This Chapter attempted to identify aspects of resilience in this specific case. However, we must admit that our approach to the concept of resilience remains questionable, so does the selection of the suitable qualities of resilience when examining a posteriori a successful case. Even more significant, this Chapter did not manage to provide answers to the key question if resilience can in fact compensate for the deficiencies in planning and preparedness. In other words, it sidestepped the core question “Can we afford to treat resilience as more than a last resort in case planning for disaster mitigation and preparedness fails?”

- DANDOULAKI, M. (2008). Spatial planning and earthquake protection in Greece. Unpublished PhD Thesis, National Technical University of Athens.
- DANDOULAKI, M. (2007). «Earthquake - Salvation» until when? Examining earthquake policies in Greece in the period 1975-2005. In: K.Sapountzaki (ed) Tomorrow in danger. Athens: Gutenberg, pp.159-192 (in Greek)
- DANDOULAKI, MIRANDA (1992). Some aspects of the temporary housing provision after the 1986 Kalamata (Greece) earthquakes. In: Aysan Y. and Davis I. (eds.) Disasters and the Small Dwelling: Perspectives for the UN IDNDR. London: James and James, σελ.136-145.
- DAVOUDI, S., SHAW, K., HAIDER, J. L., QUINLAN, A. E., PETERSON, G. D., WILKINSON, C., FUENFGELD, H., MCEVOY, D., PORTER, L., & DAVOUDI, S. (2012). Resilience: A bridging concept or a dead end? 'Reframing' resilience: Challenges for planning theory and practice; Interacting traps: Resilience assessment of a pasture management system in Northern Afghanistan; Urban resilience: What does it mean in planning practice? Resilience as a useful concept for climate change adaptation; The politics of resilience for planning: A cautionary note". *Planning Theory and Practice*, 13(2), 299-333.
- DIAMANTOPOULOS, G., (1991). Battling urban planning for the development of the city – The case Kalamata 1980-1990 – City and earthquake. Athens: TEE (in Greek)
- EARTHQUAKE PLANNING AND PROTECTION ORGANISATION (OASP) 1987a . Messinia – Earthquake of September 1986: Consequences' – Response. Unpublished study (in Greek)
- EARTHQUAKE PLANNING AND PROTECTION ORGANISATION (OASP) 1987b . Recording of secondary consequences of earthquakes of September 1986 in Messinia Prefecture. Unpublished study (in Greek)
- FOLKE, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16, 253-267.
- GAILLARD, J.C. & JIGYASU, R. (2016). Measurement and evidence: whose resilience for whom? Resilience Development Initiative, Working Paper Series, No. 11 | November 2016. Accessible on: http://www.preventionweb.net/files/50932_50932wpcnov2016gaillardjigyasu.pdf (20/11/2017)
- GODSCHALK, D. (2003) Urban hazard mitigation: creating resilient cities. *Natural Hazards Review*, 4(3), pp.136-144.
- IOANNIDES, K. & DIKEOULAKOS, V. (2001). Lessons learnt: Kalamata earthquake. In: Theofili, C. & Vetere Arellano, A. L. (eds.), 2001. Lessons learnt from earthquake disasters that occurred in Greece. EC/Joint Research Centre, The NEDIES Project. EUR 19946 EN. Accessible at: <http://www.preventionweb.net/publications/view/1497> (20/11/2017).
- LENTZOS, F. & ROSE, N. (2009). Covering insecurity: contingency planning, protection, resilience. *Economy and Society*, 38(2), pp.230-254.

- O'MALEY, P. (2012). From risk to resilience: Technologies of the self in the age of catastrophes. Paper presented at "The future of Risk Symposium", Cicago Center for Contemporary Theory. Accessible at: http://www.thecarceral.org/cn7_OMalley.pdf
- SAPOUNTZAKI, K. (2012). Vulnerability management by means of resilience. *Natural Hazards*, 60, pp.1267-1285.
- SAPOUNTZAKI, K. & DANDOULAKI, M. (2016). Risks and disasters: Concepts and tools of evaluation, protection and management. Athens: Association of Greek Libraries. Accessible in: <http://hdl.handle.net/11419/6297>
- SAPOUNTZAKI, K. & DANDOULAKI, M. (2006). Coping with seismic risk in Greece: The traditional merits of the system and the challenges for the future. In: Fleischhauer, M., Greiving, S., Wanczura, S. (eds.) (2006). *Natural hazards and spatial planning in Europe*. Dortmund: Dortmunder Vertrieb für Bau- und Planungsliteratur, pp.77-96
- UN ISDR (2016) „Hyogo Action Framework 2005-2015: Building the adaptability of nations and Disaster Relief Communities‘ (Hyogo Framework for Action 2005-2015).
- VALE L.J. and CAMPANELLA TH.J. (eds.) *The resilient city– How modern cities recover from disaster*. Oxford: Oxford University Press.
- 100 RESILIENT CITIES. <http://www.100resilientcities.org/>.