*Research Paper*

# Planning for the Wild–Urban Interface

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## Abstract

*This paper contributes to scholarly debates on urbanisation and environmental change with respect to the wildland–urban interface and heat-induced weather and climate conditions, namely compound drought and heat waves, conducive to extreme wildfire events of relevance to the Mediterranean-type climate regions. Dealing with supply-side drivers of urbanisation, by analysing the Special Urban Plan for the area in East Attica, Greece, where an extreme wildfire event took place on 23 July 2018, it evidences the incorporation of climate action in planning in the light of land policy.*

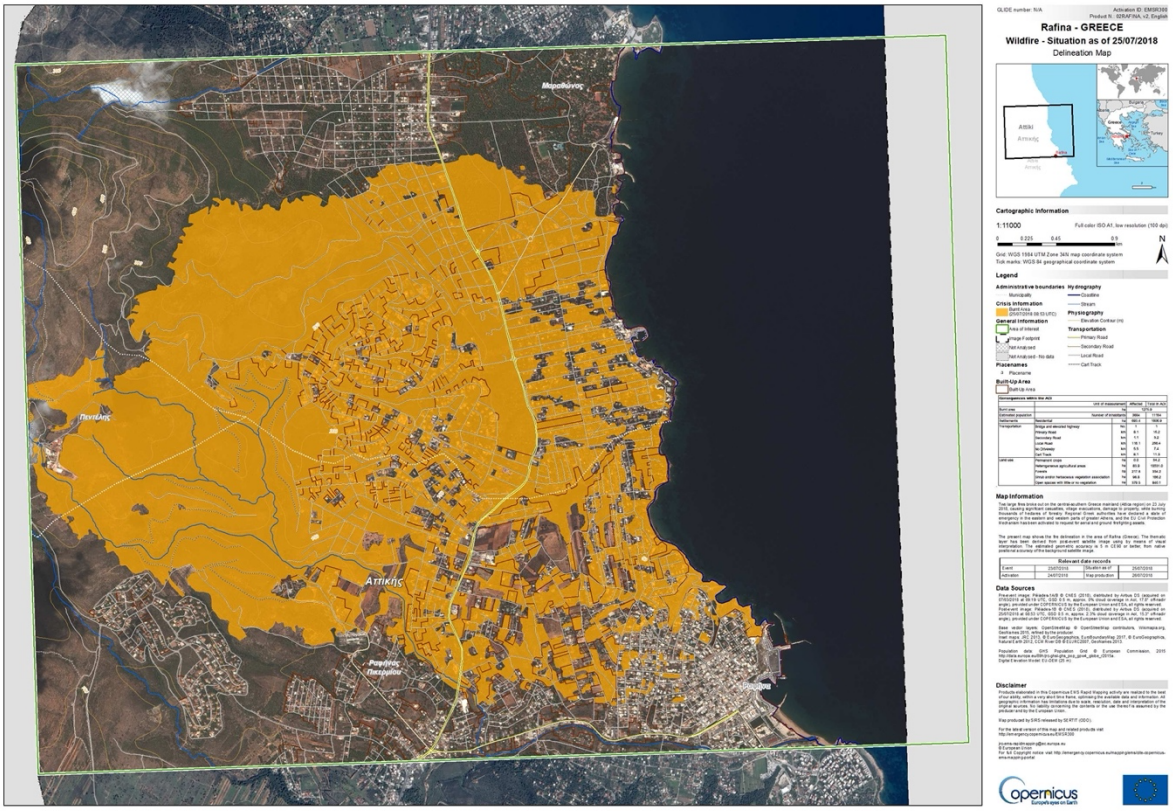


## Keywords

*planning, land policy, wild–urban interface, Mediterranean-type climate regions, Attica*


## 1. Introduction

Resulting in 103 confirmed civilian fatalities, the wildfire that broke out in the wildland–urban interface of the east of Attica, Greece, on 23 July 2018, has been the second-deadliest wildfire event in the 21st century, after the 2009 bushfires in Australia, and the second-deadliest weather-related disaster in Greece, after the major heat wave of July 1987. A state of emergency was declared by the Region of Attica and the European Union Civil Protection Mechanism was activated. The Greek General secretariat for Civil Protection activated the Copernicus Emergency Management Service Rapid Mapping Component on 24 July (see Maps 1–2). The National Observatory of Athens classified this wildfire, following Tedim et al. (2018), as an extreme wildfire event of the highest category 7 (see also Lagouvardos et al., 2019). A vexing problem for planning (Roos et al., 2021), the wildland–urban interface (urban fringe into fire-prone vegetation) and the landscape fires exacerbated by land-use changes and anthropogenic climatic change necessitate an academic and political debate about the role of government, and a focus on urban planning instruments (Bowman et al., 2013). In that light, this paper deals with supply-side drivers of urbanisation, by analysing the Special Urban Plan for the fire affected area of the Municipal Units Nea Makri and Rafina of the Municipalities Marathonas and Rafina–Pikermi of the Region of Attica (2020). This Special Urban Plan, commissioned to the Technical Chamber of Greece by the Ministry of the Environment and Energy, is the first planning instrument of its kind to incorporate measures for fire protection in relation to climate change, climate and weather extremes, and related disasters, and will be a benchmark for other wildland–urban interfaces in Greece. The paper first presents the research background, and then proceeds to outline the methodology. Next, it provides basic information about the content of the Special Urban Plan, followed by the research results, before concluding.




**Map 1. EMSR 300 – Delineation Map: Rafina. Source: Copernicus Emergency Management Service (2018).**

## 2. Background

While research exists on the reform of the spatial planning system and land policy in Greece following the policy conditionality of the three Economic Adjustment Programmes between the Greek state, the European Union member states and the International Monetary Fund under the Greek Loan Facility (2010–2011), the European Financial Stability Fund (2012–2015) and the European Stability Mechanism (2015–2018) (e.g., Giannakourou, 2019; Tulumello et al., 2019; Vitopoulou and Yiannakou, 2020), research is still lacking on the implementation of the most recently introduced planning instruments in light of land policy monitored under the European Semester for economic policy co-ordination and under the enhanced surveillance framework in accordance with Articles 2 and 3 of Regulation (EU) 472/2013 (2018–2021). The paper responds to this research gap by looking into the implementation of Special Urban Plan (Melissas, 2019, 2021), a planning instrument which was introduced by Law 4269/2014, revised by Law 4447/2016, and amended lastly by Law 4759/2020. The paper draws upon literature on planning (Lagopoulos, 2018), focusing on urban morphology (i.e., of Wentz et al. (2018) and urbanisation in the Mediterranean (southern Europe), and in particular Attica (e.g., Salvia et al., 2020), considering institutions and practices which allocate development rights through the conversion of land from its initial status into (re-)developed land (i.e., Karadimitriou and Pagonis, 2019). The paper thus links scholarly literature which concerns causes and mechanisms, the planning system and/or the content of legislative texts to the study of the content of a devised land use plan. Attention is given to land policy regarding forest areas and how it relates to planning (e.g., Melissas and Serraos, 2018), and the legal notion of “building agglomerations” (in Greek: οικιστικές πυκνώσεις), which refers to the delimitation of the outline of areas within forest land, where a certain number of buildings are in geographical proximity to one another.

## 3. Methodology

The paper gathers evidence from data which are publicly available online from the Ministry of the Environment and Energy, the Official Government Gazette, and the Council of State (Table 1). The analysis of the Special Urban Plan (Table 1: 1–7) and land policy (Table 1: 8–9) concerns analytical theories relating to land-uses and land-use planning (Table 2: 2). To dissect the proposal for the pattern of spatial organisation that the Special Urban Plan puts forward, and to discern how fire protection is incorporated, the paper employs the urban form framework of Wentz et al. (2018) (Table 3). The latter conceptualises urban form into six aspects organised under three components. First, the materials, which include the human constructed materials, soil-plant continuum, and surface water. Second, the configuration, which consists of the dimensionality of urban form (three-dimensional [3D] representation) and the spatial pattern of urban materials (2D and 3D representation). Third, (change over) time. The analysis of land policy draws upon Karadimitriou and Pagonis (2019) (Table 4) and Chorianopoulos and Pagonis (2020) to acknowledge how the procedures of the Special Urban Plan, particularly with regard to the instruments deployed for allocation of development rights, align with the legislative procedures concerning "building agglomerations".

**Table 1. Data.**

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| 1. Special Urban Plan – Preapproval (June 2019) |
| 2. Special Urban Plan – Report (June 2020) |
| 3. Special Urban Plan – Map (5) (April 2021) |
| 4. Special Urban Plan – Presentation (July 2021) |
| 5. Strategic Environmental Assessment – Report (June 2020) |
| 6. Strategic Environmental Assessment – Report with complementary data (April 2021) |
| 7. Planning / forest legislation |
| 8. Decisions by the Council of State |

**Table 2. Typology of land-use theories.**

| | | |
|---|---|---|
| Land-use theories | Scientific land-use theories | 1. Analytical land-use theory |
| | | 2. Analytical theories |
| | | 2.1. Land-uses |
| | | 2.2. Land-use planning |
| | Land-use planning theories | 3. Normative (value-laden) theories |
| | | 3.1. Land-uses |

| | | |
|---|---|---|
| | | 3.2. Land-use planning aims |
| | | 4. Normative (technical) land-use planning theories (methodologies) |

**Source: Adapted from Lagopoulos (2018).**

**Table 3. Conceptual relationship of the six aspects of urban form.**

| Components | 1. Materials | 2. Configuration | 3. Time/Dynamics |
|---|---|---|---|
| Aspects | 1.1. Human constructions | 2.1. Dimensionality | 3.1. Time |
| | 1.2. Soil-Plant continuum | 2.2. Spatial pattern | |
| | 1.3. Surface waters | | |

**Source: Adapted from Wentz et al. (2018).**

**Table 4. Development rights allocation.**

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|---|
| 1. Active planning |
| 2. Private planning |
| 3. Building cooperatives |
| 4. Exemptionary planning |
| 5. Planning of urban expansions |
| 6. Planning of settlements with population <2000 inhabitants |
| 7. Planning of second home areas |
| 8. Planning intervention in already built-up areas |
| 9. Construction inside designated settlement boundaries |
| 10. Development without permit on owned land |
| 11. Density increment |
| 12. Development without permit on owned land |
| 13. Land and development rights grabbing |

**Source: Adapted from Karadimitriou and Pagonis (2019).**

## 4. Special Urban Plan for the fire affected area of the Municipal Units of Nea Makri and Rafina of the Municipalities of Marathon and Rafina–Pikermi of the Region of Attica

On the basis of its preapproval, the Special Urban Plan aims to contribute to the reconstruction and reorganization of the environment considering, on the one hand, the improvement of urban and residential conditions, and on the other hand, the rapid restoration of natural vegetation and the preservation and promotion of natural elements. At the same time, it is expected to contribute to the removal of past spatial distortions, making the area more resistant to natural disasters. The Special Urban Plan aims to promote a new model of spatial organization based on the principles of sustainable development that will be able to function as a blueprint of spatial and urban organization for hundreds of areas in Greece, with characteristics similar to the study area, in terms of lack of a clear spatial organization that seeks a balanced coexistence of natural and man-made and a perplexed and fragmented land use policy that begins more or less with administrative acts of the early 20th. The drafting of the Special Urban Plan also takes into account data on climate change which affects Greece with regard to the intensification in extent, size and frequency of extreme weather / natural phenomena, the increase of temperature, and the corresponding intensity of the risks associated with these data (social, economic and environmental impacts).

The main objectives of the Special Urban Plan are: 1) The organization / regulation of uses and activities based on the principles of sustainability and sustainable spatial development practices; 2) Shielding / resiliency to the effects of climate change and extreme weather events and mitigation of future risks. In particular, fire protection, flood protection and corrosion protection on the coastal front; 3) The improvement of the daily life of the inhabitants and the provision of the necessary social infrastructure; 4) The planning of the necessary traffic infrastructure, the prioritisation of the road network and the traffic regulations; 5) Ensuring adequate and secure access and general accessibility; 6) The protection and promotion of the natural environment and especially the ecological one reconstruction of the coastline and streams landscape; 7) The expansion and strengthening of the communal, public character of the coastal zone, and the promotion and protection of the sea front; 8) The restoration of the natural function of the streams, by their demarcation, protection and promotion; 9) The protection and promotion of the terrestrial and marine landscape; 10) The creation and connection of the free spaces with the historical and archaeological sites, the coastal zone through pedestrian paths and possibly bicycle paths; 11) The upgrade of technical infrastructures.

The Special Urban Plan was considered as an optimal spatial planning instrument to achieve the purpose and the above objectives for the areas most affected by the fire of July 2018. In particular, it is considered a suitable tool to the extent that: it responds to the urgency of the requested intervention; Meets the need for special regulation of land uses and other conditions of their development. It can modify regulations of approved Zone of Land Development Control (ZOE), in particular regarding the permitted land uses and building conditions and restrictions, but also to include existing urban studies in the direction of the integration of fragmentary regulations; It can determine the boundaries of the existing streams within the limits of the plan.

The wider area is located in the north-eastern region of the Attica Region, between Mount Pentelicus (Pentelikon) and the west coast of the southern Gulf of Evia. It is administratively part of the Municipal Units of Nea Makri and Rafina, which are part of the Municipalities of Marathon and Rafina-Pikermi respectively, while it also includes a small part of the Municipal Unit of Penteli of the Municipality of Penteli. Its geomorphology follows in general the downhill slopes formed by the altitude curves from the foothills of Penteli to the sea, sometimes smoother and sometimes steeper. The long coastline is characterized by narrow beaches, sandy or rocky. It is also characterized by the significant altitude differences in the coastal zone, especially in the area of Kokkino Limanaki in the southern part of Mati,

which are normalized to the northern part of the area. It is crossed by a network of streams that enter from the west and the foothills of Penteli, with a direction perpendicular to the coastline. Parts of the streams and riparian areas have been damaged significant degree of reasons for arbitrary anthropogenic interventions (alterations in their physical condition, fencing, etc.).

## 5. Results

Fire protection is considered directly in provisions with respect to the natural environment (such as forest fuel) or the built environment (such as fire-retardant building materials), while it is also acknowledged indirectly in provisions delimiting spatial dimensions (especially the road network and accessibility and open spaces). In general, across varying instruments (building coefficients, zoning, etc.) fire protection becomes a function of resiliency (anticipate and withstand the occurrence and damage from wildfires rather than be based solely on fire suppression or alter the settlement pattern more fundamentally) and by that is linked to climate provisions (including disaster risk reduction). In overall, the existing spatial pattern remains essentially intact, with the particular emphasis given to individual dimensional elements of it, and the zones designated for allocation of development rights (five zones for sustainable urban development).

**Table 5. Provisions.**

| | **Fire protection** | **Urban form** |
|---|---|---|
| 1. Basic principles for the spatial pattern of organisation | | |
| 1.1. Delimitation of streams | No (linked) | Materials (surface waters) |
| 1.2. Hierarchisation of road network and traffic planning | No (linked) | Configuration (dimensionality, spatial pattern) |
| 1.3. Safety – protection | Yes (directly) | Materials (human constructions, soil-plant continuum) / Configuration (dimensionality, spatial pattern) |
| 1.4. Organisation of green zones and areas | Yes (directly) | Materials (human constructions, soil-plant continuum) |
| 1.5. “Place of Memory – Mati” | Yes (indirectly) | Time |
| 1.6. Spatial planning and urban organisation | Yes (indirectly) | Configuration (dimensionality, spatial pattern) / Time |
| 2. Special conditions / restrictions – transitional provisions | | |
| 2.1. Built environment | Yes (directly) | Materials (human constructions) / Configuration (dimensionality) |
| 2.2. Road network – accessibility | Yes (indirectly) | Configuration (dimensionality) |
| 2.3. Open spaces – green spaces | Yes (directly) | Materials (human constructions, soil-plant continuum) / |

| | | |
|---|---|---|
| | | Configuration (dimensionality, spatial pattern) |
| 2.4. Protected areas | Yes (directly) | Materials (human constructions, soil-plant continuum) / Configuration (dimensionality, spatial pattern) |
| 2.5. Delimitation of streams | No (linked) | Materials (surface waters) |
| 2.6. Coastal zone / coastal front | No (linked) | Configuration (dimensionality) |
| 2.7. Geologically suitable and unsuitable areas | No (linked) | Materials (human constructions) / Configuration (dimensionality) |
| 2.8. Shoreline – beach | No (linked) | Configuration (dimensionality) |

**Source: Author's elaboration.**

**Table 6. Timeline.**

| | 1. 2016–2019 | 2. 2020–2021 |
|---|---|---|
| Land policy (forest maps, "building agglomerations") | Law 4389/2016, Joint Ministerial Decision 34844/11.07.2016, Law 4489/2017<br>Council of State decisions 942, 1975, 1976 and 1977/2017 | Law 4685/2020<br>Council of State decisions 685–688/2019 |
| Special Urban Plan for the fire affected area of the Municipal Units of Nea Makri and Rafina of the Municipalities of Marathon and Rafina–Pikermi of the Region of Attica | Preapproval (technical report) | Drafting / public consultations / approval / second phase – implementation |

**Source: Author's elaboration.**

## 6. Discussion and conclusions

The Special Urban Plan for the fire affected area of the Municipal Units of Nea Makri and Rafina of the Municipalities of Marathon and Rafina–Pikermi of the Region of Attica promulgates small- to medium-scale alterations. The proposed dimensionality of the urban form and the spatial pattern of the urban materials adjust to the existing spatial pattern of the area. Fire protection concerns in a varying degree most provisions. It is incorporated in the proposed pattern of spatial organisation directly, indirectly or, as a function of resiliency, linked to climate change mitigation, climate change adaptation, and disaster risk reduction. This adjustment pertains to a problem of a higher level (of territorial governance), namely the delimitation of forest land within the reform of land policy in Greece, concerning the need to address building agglomerations that have accumulated within forest land without a permit through decades, in the context of the completion of the national land registry and forest maps (cadastre project), which is one of the policy conditions under the enhanced surveillance framework. The research is of relevance to the study of devised plans and allocation of development rights in general, and of planning for the wild–

urban in particular from the angle of climate change, climate and weather extremes, and related disasters, while centring on the matter of private ownership in that context (Goh, 2019).

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