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Politique foncière et résilience territoriale : le cas du bassin de la rivière Evros au nord de la Grèce

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Article abstract

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LAND POLICY IN RESILIENCE BUILDING: THE CASE OF THE EVROS RIVER BASIN IN NORTHERN GREECE

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Abstract: Land policy as an all-encompassing socio-economic domain has experienced a long-standing evolutionary process operating either as a foundational component of spatial planning or as an inherent policy entity in developmental strategies. Either way has endowed the advancement of numerous policy tools of its own, like land administration-registration practices, land banks, land expropriation, land consolidation, pre-emption rights, air rights development transfer, development rights, taxation, re-parceling and land compensation mechanisms. At the same time, land policy has been a rather critical element in all phases of safety planning (emergency planning, recovery-reconstruction planning and disaster mitigation-prevention planning). This study elaborates on the issue of land policy as an eminent component interlinking spatial planning, safety planning and development policies. Further on it highlights the wide variety of land policy tools that allow dealing (proactively and reactively) with disaster management and promoting resilient territories. Set in this context, the aim of this article is to reveal the importance of land policy in flood protection, focusing on a distinct flood risk setting: the Evros River Basin in Northern Eastern Greece; and more specifically in the making of an integrated safety-resilience planning strategy.

Keywords: Resilience, flood protection, land policy, spatial planning, disaster risk management

Politique foncière et résilience territoriale : le cas du bassin de la rivière Evros au nord de la Grèce

Résumé : En tant que processus socio-économique évolutif, la politique foncière est à la fois une composante fondamentale de l'aménagement du territoire et une entité politique inhérente aux stratégies de développement. L'une ou l'autre de ces voies a permis le développement de nombreux outils politiques qui lui sont propres, comme les pratiques d'administration foncière, les banques foncières, l'expropriation foncière, le remembrement, le droit de préemption, le transfert des droits aériens, les droits de développement, la fiscalité et la propriété foncière avec mécanisme de compensation. Dans le même temps, la politique foncière a été un élément assez critique dans toutes les phases de la planification de la sécurité (planification d'urgence, planification de reconstruction et planification d'atténuation / prévention des risques). Cette étude s'intéresse à la question de la politique foncière en tant que composante éminente reliant l'aménagement du territoire, la planification de la sécurité et les politiques de développement. Elle met en évidence la grande variété d'outils de la politique foncière qui permettent de faire face (de manière proactive et réactive) à la gestion des catastrophes et de promouvoir des territoires plus résilients. En se concentrant sur le cas du bassin de la rivière Evros situé dans le nord-est de la Grèce, le but de cet article est de révéler l'importance de la politique foncière dans la protection contre les inondations et plus spécifiquement dans l'élaboration d'une stratégie de la planification de la sécurité plus résiliente.

Mots-clés : Résilience, protection contre les inondations, politique foncière, aménagement du territoire, gestion des risques.

INTRODUCTION

The paper aims at elaborating on the interrelation between land policy, spatial planning, safety planning, development strategies and resilience building. Drawing on published results and European experiences, it analyses conceptual and partly operational dimensions of land policy, mirrored against all other institutional dimensions and with respect to resilience building. Numerous disaster studies have increasingly shed light on the need for interconnectedness between spatial planning, safety planning and developmental policies (Burby 1998, Godschalk *et al.* 1999, Mileti 1999, Pelling 2003) revealing at the same time how their potential incongruity could affect physical and social vulnerability of hazard prone areas (Greiving *et al.* 2006, Delladetsimas *et al.* 2014).

Especially in the case of flood prone areas, several scholars (White & Richards 2007, Neuvel & Van den Brink 2009) have drawn attention on the need to foster such interconnectedness, since its deficiency could well produce adverse outcomes directly affecting vulnerability patterns and in turn posing accentuated demands (and costs) in flood risk mitigation and disaster management. This absence of an integrated approach in safety policy could well lie at the heart of the generation of adverse vulnerability patterns determined among others by urbanization in high-risk zones, uncontrolled intensity of use and population densities, leading in turn to excessive costs for water management and engineering flood protection infrastructural works (Wynn 2005, Ran & Nedovic 2016). Indicative in this respect is the fact that the European Floods Directive (2007) invokes member states to implement flood risk management plans based on an integrated policy rationale, intending to "reduce adverse consequences of flooding for human health, the environment, cultural heritage and economic activity," and taking into account existing spatial plans to further promote sustainable land-use practices (Article 7).

A foundational domain that allows building this integrated approach to flood risk management interconnecting spatial planning, safety planning and developmental policies is land policy (Potočki *et al.* 2022). It is concerned with the outmost critical factor: land, upon which all protective and resilience measures can be built upon. As such, land policy implies a coordinated action by institutional agents (central, regional or local authorities, mixed institutions, partnerships or even private entities) aiming at acquiring, controlling and managing landed assets for servicing distinct initiatives (of normal or exceptional character) as well as broader developmental and investments strategies. Policy institutions at national, regional and local level, are often obliged to activate (or to introduce new) land policy mechanisms in flood-affected locations (e.g. re-parceling, land re-distribution, property rights re-allocation, land compensation, re-location and shelter provision for affected population) in order to meet the demands posed by emergency conditions and recovery processes. Set in this context, this paper aims at elaborating on an integrated approach, based on the interrelation between land policy, spatial planning, safety planning, development strategies, in order to reduce vulnerability and attain resilience building; the latter referring to the capacity of communities, facing risks, to resist or adapt to eventual impacts and changes efficiently (Jha *et al.* 2013). Furthermore, the paper aims at shedding light on the potential of land-policy instruments to assisting proactive and reactive initiatives in building a resilient environment. In this respect, the significance of specific land policy tools will be additionally *inferred,* as contextualized within an integrated resilience strategy that seeks to assimilate risk reduction needs under distinct local developmental dynamics.

The study draws on European experiences and focuses on Greece characterized as an exceedingly multi-risk environment (having experienced historically numerous catastrophic events earthquakes, floods, forest fires, extreme weather events), in the context of which, land policy has played a rather unbalanced role in risk mitigation than in other European settings (Delladetsimas 2006). It would seem, land policy in this case focuses predominately on mechanisms, like land consolidation and expropriations, which are mostly activated in support for emergency actions, post-disaster reconstruction processes and predominantly on developmental initiatives. Especially in the case study area, the River Evros basin -extending along Northern Eastern Greece and operating as a border between Greece, Bulgaria and Turkey- re-parceling mechanisms, land consolidations and expropriation plans have been implemented mostly seeking to increase productivity of agricultural land, as well as for infrastructural works implemented in response to various devastating flooding events that seriously affected the local communities of the area in question.

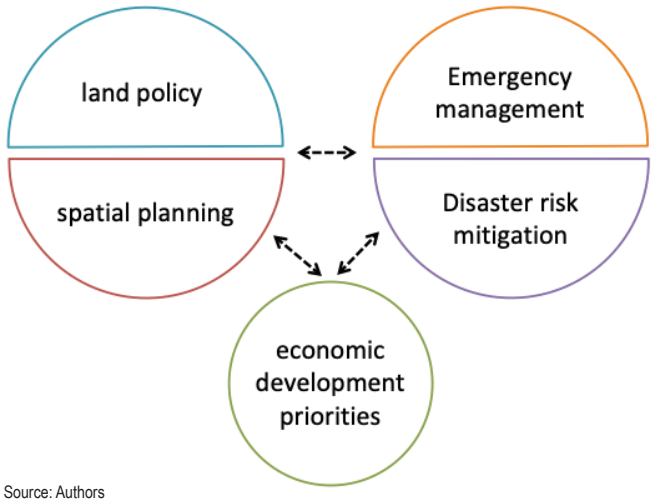
The paper is structured as follows: The first part, unfolds theoretical and policy dimensions of integrated approaches in tackling vulnerability and resilience building; in this respect the role of land policy is systematically examined. A partial explanatory overview of cases is thus provided showing how land policy combined with spatial and safety planning -as an integrated policy domain- could shape resilience building in many European contexts. The second part places emphasis on the analysis of the spatial planning, safety planning and developmental trajectories in Greece and in this context evaluates the role of the land policy system. The third part contextualizes the case study area (Evros river basin) focusing on flood disaster experiences, pre-disaster implemented land policies, post-disaster recovery measures, development strategies and flood risk management provisions. The empirical work in the case study area has involved a visit of the research group in the main cities and towns situated across the river basin, the study of historical flooding experiences, elaboration of data from the Hellenic Statistical Authority, the Hellenic Organization of Agricultural Insurances, the Land Improvement Organization and the Periphery of Eastern Macedonia and Thrace. The study also involved open interviews with two (2) main representatives of the Regional Civil Protection Authority. The last section critically presents key findings from the case study analysis leading to the conclusions and final considerations for future policy change.

UNCOVERING THE NEXUS BETWEEN LAND POLICY AND RESILIENCE BUILDING: THE QUEST FOR AND INTEGRATED APPROACH

Within the realm of the resilience debate, analytical and policy emphasis has shifted to the search for multidimensional processes of resilience building, analyzed in terms of institutional preparedness, resistance of physical structures and community capacities to cope, recover and learn from crises and disasters (Holling 1987, Coccosis *et al.* 2021, p. 3). Resilience is defined as complex, place-based and context-specific notion (Cutter *et al.* 2008, Forino 2015) built on historical practices and disaster experiences that create opportunities to strengthen local organizational capacities in support of subsequent socioeconomic and spatial development dynamics. Nonetheless, already since the 1990s, spatial planning and land policy began to be approached as structural elements of resilience, guiding risk mitigation actions, and shaping adaptation measures (Milleti 1999, Godschalk *et al.* 1999, Alexander 2018). Evidently land policy has been acting in many contexts (the Netherlands or UK) as a construct of spatial planning and property relations (Davy 2012), while in others has been maintaining a relative autonomy. However, in any case both entities constitute a dual instrument in the development of resilient territories, by regulating (among others) infrastructural development and built environment, while encompassing strategic interventions to deal with risks (eg. natural or man-made disasters and climate change) and socio-economic vulnerabilities (Brunetta *et al.* 2019, Meng *et al.* 2020, McMillan 2022, Salata & Yannakou 2020). What

has to be underlined here is that spatial planning does not operate in an institutional vacuum. It is interlinked with various policy fields such as emergency management, risk reduction/mitigation and land policy that are in turn affected by all aspects of socio-economic development priorities (Figure 1). Resilience building is, therefore, strongly determined through persistently achieving interconnections in all components of the aforementioned policy spheres.

Figure 1. The interconnection of policy spheres associated to spatial development, safety planning and economic development



Source: Authors

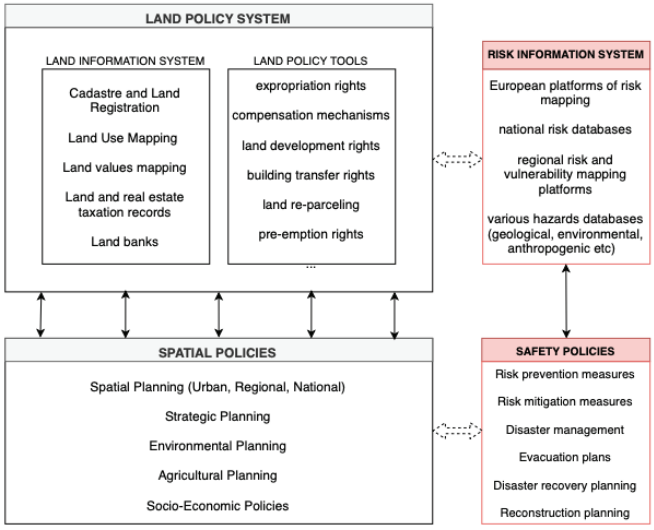
Although the role of land policy is not sufficiently recognized in resilience literature (party due to the fact that it has been mostly intermingled with spatial planning), in the context of this work, it is approached as an out most critical construct that underpins the amalgamation of different policy fields providing a variety of tools, which allow structuring integral spatial safety and resilience policies. Land policy is defined as the whole complex of socioeconomic and legal prescriptions that dictate how land and use/access rights, are allocated, re-distributed and safeguarded (UN/ECE 1996). It constitutes an institutional-policy domain servicing a dual purpose by providing: (i) a wide range of tools that can contribute to state and social action for the control and management of landed assets (Delladetsimas *et al.* 2019) and (ii) a basis for interaction of various policy domains, including risk prevention and mitigation in all aspects of spatial development. The composing tools of land policy comprise cadastres, land information systems (comprising information regarding land uses, real-estate values, use and development rights etc.), land banks, expropriation policies, pre-emption rights, development rights, air rights development transfer, taxation, re-parceling, land consolidation-land compensation mechanisms, rent controls and property sharing schemes.

In this context, the land policy system (other than with spatial planning and development policies) has been multifariously interlinked to all the different phases of safety planning as structured in relation ti the phases of the disaster management cycle: a) prevention-preparedness, b) emergency response and relief, c) recovery-reconstruction, and d) risk mitigation. Land policy practices have been assuming a foremost importance, as in each phase different accentuated demands are developed, for the provision of new or the safeguarding of available landed assets. To be more specific, in the emergency planning domain, land policies have proven crucial in exceptionally providing land for evacuation areas, emergency shelter installations, logistics distribution areas and disaster waste disposal zones. In the case of recovery-reconstruction planning domain, land policy comes into play by making available areas for redevelopment away from disaster-prone zones and by introducing in all land development initiatives a 'safety element' fostering resilience building. Even more, experiences of disaster affected areas reveal the importance of many land policy instruments in the implementation of recovery policies (Grebler 1956, p. 151, Mileti 1999, Coccosis *et al.* 2021) as well as in vulnerability reduction strategies and the making of resilient territories. As a matter of fact, land administration systems, for example, are often mobilized to support the implementation of disaster risk reduction measures, providing detailed information and data about land ownership and vulnerability indexes, that could support evacuation plans, flood scenarios and the identification of highly-vulnerable built up zones (Kurwakumire *et al.* 2021). It becomes necessary to emphasize that especially in post-disaster recovery phases, the re-arrangement of property rights emerges as a critical and complex task to handle. In other words, significant obstacles maybe posed to a reconstruction process by private property interests, making necessary the enforcement of exceptional measures (expropriations, taxation of development values, rent controls, property reallocations). Additionally, abrupt changes in land uses, caused by catastrophic events, may also result in new land claims, informal occupations or access rights to land and resources, further unveiling the need for an effective land policy involvement (Mitchell 2010, Erdem 2011). The role of land policy is further accentuated by the gravitating role that real estate taxation and tax relief measures tend to assume in disaster recovery policies (Park *et al.* 2019). Moreover, land consolidation and re-parceling are applied (proactively and reactively) in disaster prone areas to regulate the re-distribution of land tenure rights and guide spatial development on safe zones, to facilitate flood risk mitigation and climate change adaptation (Damen 2004, Dekavalas 2003 in Coccosis *et al.* 2021).

All the above denote that land policy encompasses the unique capacity to safeguarding and/or re-distributing public and private rights on land, and the suppleness to respond to abrupt needs for land use changes, introducing new tenure patterns of use, access and development rights. As Mitchell & Garibay (2011, p. 8) emphatically stress, disaster risk management is much more effective where land governance institutions have adequate capacity and flexibility to handle ownership rights and establish durable tenure arrangements.

Different land policy systems have evolved in relation to historical dynamics unraveled in distinct spatial contexts and shaped a series of land-related institutions, administrative structures, and managerial agendas. National land reforms, cadastres and land registration systems reveal the role of land administration as a substructure (Williamson 2001) that underpins the notion of public interest and, in turn, the limits inflicted to governing the relationship between public and private sphere while implementing spatial development and safety policies. Figure 2 presents a variety of land policy tools and mechanisms that can support an integrated spatial policy system, which incorporates multi-level risk management (or governance) strategies and effectively contributes to resilience building. The figure further shows that the land policy system evolves through a perpetual engagement with the spatial planning system and supports the implementation of various policies through the provision of available land assets (exported by the land information system) and the respective tools to managing them. On that account, enhancing resilient territories is bound to be complemented by an integrated policy process, in which land policy plays a key role and constitutes a shared basis that facilitates the constant building of interconnections between spatial planning (land use plans, regional plans, development control), safety planning (emergency planning, recovery-reconstruction planning, risk prevention-mitigation planning), and socio-economic development policies (economic zones, enterprise parks, developmental strategies and incentives, environmental compensations, agricultural policies).

Figure 2. Interconnections between Land Policy system - Spatial Planning and policy - Safety Planning and related policies.



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EXAMPLES ACROSS EUROPE

When we come to the issue of flooding, experiences in Europe, regarding protection management and governance, emanate from exceedingly different institutional formation paths that portray diverse patterns of embeddedness of safety practices. For this reason, we consider necessary to make some brief remarks on the European experiences that allow placing the study area in a broader analytical context and understanding the flood safety issue and resilience building. On the whole, safety policy has been progressively integrated to spatial planning, although a moderate prevalence of the engineering rationale is retained. Furthermore, there has been a gradual policy change in the field of civil protection through which the states have regained a more accentuated role, partly explained by the devastating disaster experiences that brought at the frontline public institutions in emergency and recovery stages. There are thus countries characterized by complex systems of horizontal and vertical institutional interactions and clear distinctions between the responsibilities and competences of the central state, the regions and the local authorities in charge of flood risk management. In the case of France that reflects a compound evolution of national regulations and regional plans, as well as the development of local and inter-municipal strategies and collaborations to proactively deal with floods (Liefferink *et al.* 2018). However, the 'compartmentalization' between spatial planning policies and flood risk management often leads to the prevalence of a flood defense approach (Fournier *et al.* 2017) and a technical-engineering rationale (Delladetsimas *et al.* 2014). At the antipode, there are cases of countries, where traditionally there is a prominence to structural–technical works and emergency response systems, undermining in many respects the making of a comprehensive prevention and resilience strategy.

Within diversified European experiences, the role of land policy – which is our key concern here- assumes varying forms and substance in its engagement. Within a different governance setting, land policy in Italy also performs a different though critical role in flood risk management. The Italian situation is characterized by a complex system composed by numerous formal and semi-autonomous institutions, operating at various governance tiers and spatial levels. Within this governance setting, land policy is institutionally intertwined with spatial planning, especially due to the long-standing tradition of the country in land administration, cadastral-registration practices and planning prevention policies involving expropriation-land readjustment schemes, land use policies, planning relocations, planning regulations and adaptation measures[1]. To our reading, the merits of the Italian system to dealing with disaster is its reliance on the use of solutions and tools already developed within the cadastral informational arrangement that can be accessed effortlessly by the Civil Protection[2]. In this manner, a resourceful process of consultation and implementation is deployed, that emanates from an elaborate cadastral cartography and can be accessed even from mobile appliances or through web map services, allowing for a swift implementation of land and planning policy measures. Furthermore, reference could be made for other European states that land policy tools portray a critical role in flood management and governance practices. In the Czech Republic (Podhrázská *et al.* 2015) and Slovakia (Jusková *et al.* 2014) for instance, flood control measures, soil-erosion control and landscape protection have been integrated in rural land consolidation priorities. In Switzerland, the costs of flood damages are incorporated in the evaluation of economic benefits resulting from land consolidation projects (Hiironen *et al.* 2010). Moreover, the exercise of pre-emption and expropriation rights, as policy instruments that facilitate the required land property changes, was incorporated in the 2010 Water Law in Serbia in the context of flood risk mitigation and emergency management policy (Nicolic 2021).

However, before elaborating on the Greek case study area, it is worth referring to some distinct experiences in the European setting, originating from different historical derivatives, with a long-standing tradition in flood prevention, but comprising at the same time a pronounced role of land policy in the making of a safety process. Indicative in this respect are the Netherlands and Belgium. First, the Netherlands exhibits an outstanding history in flood risk mitigation as conditioned by the accentuated demands for water management, flood prevention infrastructure, polder development and land reclamation. This tradition has led to processes of constant upgrading and institutionally upholding land policy instruments, which has reciprocally shaped the development of an elaborated spatial planning system that further provided a complimentary "safe" landed setting (Needham 1997) integrating water-related strategies for flood risk mitigation (Lu & Stead 2013). As Liefferink *et al.* (2017, p. 283) aptly state "water has become an organizing principle in spatial planning"; fact that is further justified by the competences of the waterboards in planning processes (Woltjer & Al 2007). Land policy in this case operates as a core basis for spatial planning, other policy sectors (environmental, agricultural, socio-economic) and evidently risk and water management (van Doorn-Hoekveld & Groothuijse 2017). In the Netherlands, this deep historical land policy background -or what is defined as "active land policy"- has been evolved and structured in association to the provision and safeguarding of "public goods"; a

1 Of particular relevance in the context of this work are two distinct river basin strategies: (a) The River Po Basin in Lombardia, for which in 2015 (17/12/15, n. 4/2015) the flood risk plan (*Piano di Gestione del Rischio di Alluvioni* <PGRA>) was endorsed and amended in relation to its implementation details in 03/03/2016 (n.02/2016). (b) The *Arno River Basin in Tuscany, for which the "Piano di Gestione del Rischio Alluvioni del bacino del fiume Arno con apposizione delle misure di salvaguardia"* (Comitato Istituzionale n.231 and 232/2015) was approved and followed by consecutive revisions. Both cases reveal the importance of land policy tools in flood prevention.

2 The Law 267/98 constituted the first attempt to combine land and water resources with planning, introducing the Hydrogeological Plan (*Piano di Assetto Idrogeologico* <PAI>) for the identification-delineation of hydrological risk areas and the respective protection measures. Moreover, "values of ecological and socio-ecological resilience were increasingly incorporated prompting a gradual shift towards a risk-based approach" (Genovese 2019: 522). The Law 365/00 has additionally placed emphasis on joint implementation procedures between the Regions, the Prefectures and the Basin Institutions (*Autorita del Bacino*).

notion that also encompasses safety and flood protection principles[3]. Absolute (expropriation) and shared used may occur in the name of regulatory legal entities such as the State, provinces, municipalities, and the water boards. The three elaborate dimensions of land policy (planning compensation rights, obligation to consent, and expropriation) to our reading, stand on the basis of the entire safety and especially flood protection policy in the Netherlands involving the areas of the Delta Plan[4], Water Storage Areas and river basins.

Similarly, in the adjacent to the Netherlands case of Belgium, land policy serves again (under different terms and conditions) as an inherent policy domain that operates as a basis to integrating land use regulations, flood risk management and environmental protection. Belgium assumes importance here also due to the fact that -weirdly enough- shares a similar socio-economic determinant to that of Greece; which is no other than the fragmented landownership structure, that conditions (among others) planning and developmental decisions. In the case of Belgium, the obstacles posed by small-scale and fragmented property have been partly overcome by the prevalence given to land policy tools and associated decisions, in the purposive effort to achieving a safe-resilient environment and the respective emphasis given to the nexus between flood management, mitigation strategies and spatial planning. Highly indicative in this respect is the lenient practice of expropriation and exercise of pre-emption rights by the water management authorities in flood-prone areas. Since the enforcement of the 1962 Expropriation Act, water management authorities obtained the right to expropriate the necessary assets, while the 2003 Decree on Integrated Water Policy, further promoted the exercise of pre-emption rights in flood risk management areas (Mees *et al.* 2016). Especially in the "signal areas" (specific vulnerable zones indicated in land use plans) a wide range of land policy tools can be implemented in order to minimize flood risk. For instance, re-parceling with land swap can be effectuated in line with the Decree on Land Organization for transferring population located in highly vulnerable areas to safer zones, followed by respective provisions of land expropriation and compensation. In this respect, the *Sigma Plan*[5] is an illustrative example that reveals the crucial and leading role of land policy as combined to spatial planning in concordance to flood management, land use regulation and environmental protection policies. Within Sigma Plan projects, land policy tools are regularly implemented to achieve a safe land development pattern and distinct protection goals. These include land reclamation, expropriation and compensation, land exchange through the Flemish Land Bank, compulsory land purchase, re-parceling and land swap. Land expropriation and land swap have taken place in order to 'move' plots located in vulnerable areas to low-risk zones, for evacuation purposes in flood control areas and for the construction of hydraulic engineering works. The Belgian State in principle considers eligible for compensation damages caused by exceptional events. Of particular relevance however is that since 2003, the Flemish Region, enforced the compulsory insurance against natural hazards. In a way, this combination of pro-active flood management and insurance policy denotes an inherent will to the making of integrated disaster prevention strategies and consequently in resilience building.

THE CASE OF GREECE

The experience of flood protection and management in Greece has not relied on comprehensive arrangements and has been based predominately on an engineering rationale and even more on the prevalence of emergency response systems (paying less attention to prevention policies). This has been revealed from various studies regarding the flood history of the country (Diakakis *et al.* 2012, Kourgialas & Karatzas 2017) and has been brought to the front in the policy debate after the endorsement of the EU Flood Directive (2007). However, it must be stressed that Greece could be characterized as an "exceptional environment", since its socio-economic and spatial development trajectories have historically been conditioned by disasters (wars, exceptional migration flows, earthquakes, landslides, floods, forest fires) and the subsequent recovery processes; involving distinct regional rebuilding experiences, relocation of towns and villages, and extensive land consolidation schemes. This "exceptionality" background has generated adverse effects regarding the evolution of state policy and in essence not countenancing to foster interrelationships between policy domains like spatial planning, safety planning and socio-economic development policies. These policy domains appear to have been following a rather independent path and posturing an intrinsic inability to produce an integrated rationale, when dealing with all phases of a disaster cycle. In this context, the role of land policy is rather independent and not servicing an integrated approach. The land policy system appears to be more actively present in emergency management phases (land confiscations-expropriations for emergency uses and sheltering), in recovery-reconstruction processes (rebuilding loans, crops compensations, recovery programmes) and in rural development strategies (not directly linked to prevention policies), expressed mostly with agricultural re-parceling and land consolidation schemes (Beopoulos 1996, p. 63). The latter, consisting of works for rural land redistribution aimed at adjusting and consolidating land ownership in a specific location; so that the owners receive plots of equal value, and larger plot size, whose shape and location ensure their best exploitation and productive utilization (Law 674/1977)[6]. By and large, in the Greek territory, expropriation and land consolidation are almost the exclusive legal tools that have historically been deployed, amid periods of crises and disasters to address recovery and reconstruction needs.

It could be argued, however, that since compliance to the 2007 EU Flood Directive, the prevailing rationale has been emphatically modified. The EU Directive sets a framework for an effective flood risk management obliging the member states to conduct preliminary flood risk assessments, prepare flood hazard maps and flood management plans. The directive has brought into force the implementation of a comprehensive flood protection policy (applied to all kinds of floods: river, flash floods, coastal floods, storms and tsunamis). Greece has thus complied to EU Directive and ensued the three stages of the recommended integrated approach whereby: (a) by 2011 to produce a preliminary flood risk assessment of river basins and coastal zones and to identify areas where potential significant flood risk exists; (b) in continuation, by 2013, to develop flood hazard maps and flood risk maps for such risk areas (with a medium likely hood of flooding at least a 1 in 100 year event) and extreme or low likelihood events; (c) to formulate by 2015 flood risk management

3 More specifically, there are three situations, under which the government is equipped with powers to infringe on private property rights (Buitelaar 2010, p. 352-354): a) No Shared or Absolute Use, where the government itself is in position to enforce restrictions on private property based on the power of the land use plan. b) Shared Use, with which the government is in position to impose permanent or temporary shared use of a private property for the general interest (Article 1, Private Law Hindrance Act). c) Absolute Use, in the context of which the government considers that expropriation, or the absolute disposal of real property, falls within activities of public interest.

4 The **Delta Plan**, is one of the greatest flood protection projects world-wide, implemented after catastrophic flood events in 1953 that affected the Southwest of the country. The Plan was completed in 1986 and it is composed by four barrier and six secondary dams and numerous supporting works.

5 After the devastating floods that hit the wider area of the Scheldt River in 1976, the Belgian government launched a plan, named 'Sigma' from the initial letter of the river Scheldt, inspired by the Dutch Delta Plan. The Sigma Plan included merely engineering projects and infrastructure works for dams, dikes and water barriers. Since 2005, the Plan has been updated and several projects have been developed integrating different strategies and measures associated with flood prevention, spatial development, land use planning and environmental protection.

6 This legal definition of re-parcelling reveals a strong bond between the use of the tool and the quest for economic efficiency and productivity of agricultural land.

plans for risk zones and measures to reduce the probability of flooding and its potential consequences. The Directive was incorporated into the Greek national legislation in 2010 through the Joint Ministerial Decision 31822/1542/E103. At the present time -and irrespective of the actual implementation efficacy- the country has complied with addressing all aspects of the flood risk management cycle.

INSIGHTS FROM THE EVROS RIVER BASIN

Socio-economic development trajectories

In the Eastern Balkan Peninsula, Evros River extends on the borders between Greece and Bulgaria and between Greece and Turkey (Figure 3). Only 6,3% of its total length falls within the jurisdiction of the Greek state having as the main tributaries the rivers Ardas and Erythropotamos. The river however being also the physical boarder line to Turkey, denotes an exceedingly complex geostrategic condition, where civil protection priorities are intermixed with defense ones and in many respects operating against each other. Evros River has attracted international interest, especially during the events of February-March 2020, when the Turkish state unilaterally announced that it opened its boarders to all migrants and refugees to move to Europe, giving order to the security forces not to obstruct their movements. It thus instrumentalized migration flows and in essence pushing them forward to cross the Evros boarders. This has caused the concentration of tens of thousands of migrants to the basin, attempting to forcefully cross, causing an unprecedented boarder crisis, which in turn marked (among others) an accentuated policy change by the Greek state as expressed by the prioritization of mere defense-security against (presumably) civil protection measures. It has to be underlined, here, that defense and national security issues remain a priority in the area (Skias & Kallioras 2007) and in essence make it difficult to generate an all-embracing policy safety arrangement.

Nonetheless, a plethora of activities related to the Evros Basin have been developing along the adjacent basin territories, that vary from irrigation, water supply, urban sanitation and power supply, corroborating the high contribution of the river to the socioeconomic development of the region. The permanent population counts 147,530 inhabitants in the Evros Regional Unit (RU), 37% of which is classified as rural[7] (Hellenic Statistical Authority 2011). The regional economy mainly comprises agriculture and livestock farming, while the production of cotton, wheat and meat is among the highest at national level. More than the 70% of the total dry cotton and sunflower seeds production in Greece, among others, comes from the Evros region[8]. Almost half of the total Evros River catchment area consists of agricultural land (IEY-ELKETHE 2010). The fertile agricultural land uses alongside the river basin have been constantly contributing to the local economy, but at the same time are characterized by accentuated vulnerability conditions. Devastating floods have been a constant concern for local communities and the regional authorities, questing also for national response amid extreme weather events. Some of the most recent flood disasters that have occurred caused:

a) in 2005 huge damages on infrastructure and agriculture;

b) in 2006 the evacuation of two settlements as well as damaged transport and water supply networks, while during the same year 45 flood events resulted in the inundation of 650,000 ha and 2,370,000 euros compensations were distributed for local agricultural holdings (Ordoubozanis 2006);

c) in 2010 the flooding of several housing units and the inundation of 35,000 ha;

d) in 2018, severe damages to river embankments and the inundation of 6,500 ha; the economic losses for cotton growers, were estimated to reach 12,000,000 euros (Kritou 2018).

On aggregate, since 2005, about 300,000 ha were inundated corresponding to an estimated total loss in economic and productive assets of approximately 75,300,000 euros (Ministry of Environment and Energy - YEE 2016).

Figure 3. The Evros River Basin and the country borders of Greece, Turkey and Bulgaria.

Source: Ministry of Environment and Energy [MEE] (2016: 8).

The flood protection policies in the Evros Basin

Flood risk management arrangements in the region date back to 1934, when the Greek and the Turkish government signed "The Agreement on the Installation of Hydraulic Systems to start hydraulic and flood protection works on both sides of Evros river". In 1953, the two countries assigned to the HARZA Engineering company a project on flood protection works to be developed alongside the river banks, under the supervision of a joint Committee. Nonetheless, due to the strained relations between the neighbouring countries, the development of infrastructure initiated years later and lasted until the mid '70s on the basis of a number of bilateral agreements and projects for channels alignment, the construction of dikes, levees and dams-reservoirs (see Chouvardas & Papapostolou 2016). Flood protection works were partly accompanied by reclamation measures and border adjustments of land segments. During the same period, similar policies were agreed between the Greek and Bulgarian state for their shared part of the river. These works remain up to present the dominant flood control engineering structures and have often revealed deficiencies to addressing severe flood events. The period until 1975, characterized by a boost given to engineering flood control works, was followed by attempts to reactively address water hazards through reconstruction processes of flooded areas by improving infrastructure, as well as systematizing compensation mechanisms for the affected holdings and businesses (Skias & Kallioras 2007). Moreover, since 2005, risk management actions undertaken by local

7 According to the Greek Spatial Planning legislation and the National Statistical Authority, the term 'rural population' describes population in towns and settlements with less than 2,000 inhabitants.

8 The rich natural environment has also triggered the development of eco-tourism associated also with the designation of two National Parks and eight protected areas part of the NATURA 2000 sites network.

and regional authorities, as well as by the Civil Protection have been merely based on:

1. the restructuring and the improvement of engineering infrastructure (embankments, drainage systems etc.),
2. emergency evacuation management of settlements and controlled flooding for the protection of inhabited areas, and
3. post disaster relief-compensation measures for affected population, business and agricultural holdings.

Indicative of the prevalent emergency management and post-disaster recovery system is the distribution of disaster indemnifications.

The search for an integrated policy rationale in flood management

All the aforementioned denote a long-term lack of an integrative rationale between planning, land policy, flood risk mitigation and socio-economic development goals. It could be argued that the prevalent risk management system focuses on a fragmented logic of tackling specific flood impacts rather than an integral flood risk mitigation and disaster prevention rationale. A noteworthy transition towards integrated policy making (yet incomplete) has been marked after the enactment of the European Directive 2007/60/EC on the assessment and management of flood risks. In this context, by 2018 the Flood Risk Management Plan (FRMP) of Evros was drafted (Law 2639/2018) in compliance to the European Commission's Directive[9]. Among the priorities that were set by the FRMP has been again the preservation of agricultural land, which as a developmental priority appears to conflict with flood risk mitigation. More specifically, as it is underlined in the report, any flood risk mitigation measure and intervention should be implemented with a view to preserving agricultural land and to avoiding land use fragmentation; especially in the case of High Agricultural Productivity lands, any proposed work or activity should not jeopardize the preservation of its qualitative characteristics (Par.1.4.-L2639/2018). Furthermore, the FRMP proclaims the restructuring of agricultural crops in the inundation zones simply for incentivizing the plantation of certain vegetation species that could operate as a natural barrier to future flood hazards (Par.1.8. -L. 2639/2018). The absence of an integrative rationale has been also denoted in the 2003 Report for Spatial Planning and Sustainable Development (East Macedonia and Thrace Periphery: Article 3, Government Bulletin 1471/B/2003); but in the subsequent Regional Plan the issue (Government Bulletin 248/2018) was not taken into consideration. All in all, despite the "favourable environment" generated with the European directive, the designation of flood risk zones lags behind and therefore reduces the possibility to introducing effective land policy measures for vulnerability reduction.

The role of land policy

In the aforementioned proposals and plans no particular consideration has been given to land use transformation and land policy (Figure 4). The implementation of land policy practices, as applied in other European experiences (such as expropriations and pre-emption rights) is almost absent. Weirdly enough, land consolidation schemes seem to have been operating against safety. More specifically agricultural land distributions, through consolidations (on wide and high riverbeds) have been accounted to be the most detrimental causes of flood risks and disaster losses in the Evros Regional Unit (YEE 2016). As a matter of fact, since the '50s, land policies implemented at regional level incorporated land consolidation and re-parcelation projects of productive agricultural land on the Evros riverine[10]. The restructuring of land plot patterns through land consolidation projects has for long been deemed necessary, in order to tackle operational weaknesses of the agricultural holdings, to increasing productivity, and reducing structural costs[11]. The same has been applied in the Evros region but the adverse implementation by the state of land consolidations schemes in the basin, led to the allocation of agricultural holdings in vulnerable to flooding zones. In other words, the endorsed land consolidation schemes were not accompanied by the necessary safety works and as a result stipulating adverse and unprecipitated shifts in the existing flood risk levels (Tsesmelis 2006). Furthermore, the longstanding riverbed management interventions have predominately targeted on the preservation (and increase) of arable land, reducing (unintentionally) the capacity of the flood plains (Chouvardas & Papapostolou 2016) and hence further increasing vulnerability.

Even in the recent attempts towards an integrated approach to flood safety, triggered by the European directive, the preservation and cohesion of agricultural land is thus strongly prioritized and projected as the sine qua non pre-condition of economic development. In other words, land policy does not appear to have any inherent role in the making of a safe and resilient environment. It appears to be supporting mere socio-economic priorities for the local farming communities. In this context, the search for new areas to be designated by the Regional Plan as High Agricultural Productivity Lands assumes overwhelming significance (Article 6) and land consolidations seem like the exclusive means to further enhance agricultural productivity (Article 14). Flood protection remains a separate policy domain in the Regional Plan and flood management provisions consisting of a number of projects (drainage systems, embankments, pumping stations) and especially land levees. Overall, land policy measures implemented throughout the years -and even nowadays- have not been combined to flood risk mitigation but have acted autonomously and as a result have even aggravated the vulnerability conditions of the case study area.

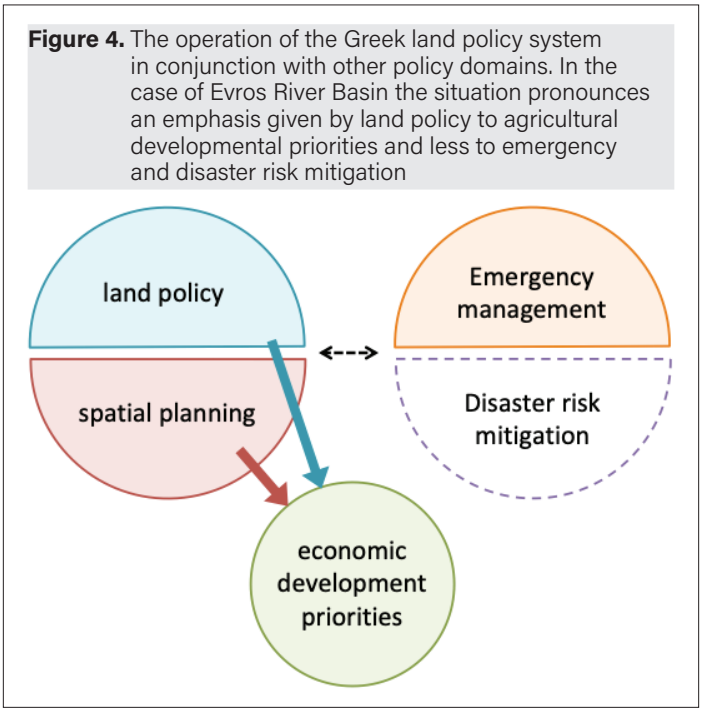

Figure 4. The operation of the Greek land policy system in conjunction with other policy domains. In the case of Evros River Basin the situation pronounces an emphasis given by land policy to agricultural developmental priorities and less to emergency and disaster risk mitigation

9 During the same year, some additional disaster preparedness and disaster recovery measures were implemented (Kritou 2018) amounting to 6.000.000 euros; while in 2019, further compensations to flood affected population in the area reached 1.164.013 euros.

10 Agricultural holdings in the Evros regions (and in Greece) are characterized by a small plot size -with an average of 4.8 ha- (OPEKEPE 2016), and fragmented land ownership, which is further aggravated through the years, due to inheritance customs and traditions

11 Indicatively, between 1953 and 2005, around 1,000,000 ha of land underwent land consolidation processes in the Greek territory.

CONCLUSIONS

The paper has aimed at revealing the importance of land policy in flood disaster management-governance and resilience building, operating as a strong interlinking component between all policy domains involved in the process: spatial planning, safety planning and socio-economic development. European experiences and in particular cases such as the Netherlands and Belgium, manifest the multifarious role of the land policy system in maintaining strong interrelationships and allowing for an effective function towards integrated disaster management-governance and resilience building strategies. These cases have above all demonstrated how this role has been consolidated through the implementation of distinct land policy tools (especially pre-emption rights and expropriations). Evidently the Netherlands and Belgium involve an embedded land policy tradition, which is still active exhibiting a significant potential for the making of a competent flood protection and resilience policy. Land policy in these cases, seems to serve, at varying degrees, as a basis for land use planning, risk management and governance. At the antipode lies the case of Greece and especially the Evros-cross-border area. Safety policy in this case is characterized by the predominance of rather "technical" policy notions in terms of flood risk management (physical protection: levees, dams, etc.) and emergency response measures (rescue, population evacuation plans). What this paper attempts to underline, in this respect, is the introduction of an effective land policy in the safety agenda of the study area.

Especially since the endorsement of the EU Floods Directive (2007), there did appear a growing need for the coordination of sectoral actors, different plans and endorsed measures towards an integrated policy that will at the same time be compatible to the distinct aspects of socio-economic development of the boarder area (Common Implementation Strategy 2010). The endorsement of the EU flood directive in Greece, provided an impetus for a transition towards more integrated approaches of disaster management, incorporating spatial plans, risk and vulnerability mapping. This integrative approach in many respects could pave the way to implementing an effective flood safety policy. For the time being however, since risk flood zones have not yet been officially delineated (in compliance to the EU directive), the role of land policy remains inert. Land policy tools could foster and facilitate land use, access, and property systematizations both for risk mitigation and emergency management. Likewise, the Netherlands and Belgium have for long integrated the effective use of such tools in planning, in land reclamation works and water management infrastructure, generating an integrated spatial planning and other sectoral policies approach that guide socio-economic development.

Moreover, Evros River Basin indicates above all, how the land policy system has not been in position to develop the appropriate links: (a) with safety planning, consisting predominately of measures focusing on post-disaster recovery (compensations for affected landowners) and (b) with spatial planning, resulting in disjointed implementation of land expropriation and consolidation schemes that aggravate existing vulnerability conditions. Hence, the case of Evros not only reveals the disjointed operation of spatial planning and flood disaster management, but at the same time, the independent operation of land policy from the other domains, which aggravates flood risk and vulnerability of riparian agricultural lands. In other words, land policy is confined to guaranteeing land productivity (land re-parceling, land consolidation) and strengthening the primary sector of regional economy disregarding the economic offset by disaster losses and compensation costs.

Upgrading land policy tools (such as pre-emption rights) and promoting their integration and interaction with the water management, safety and spatial planning, might well be the most imperative initiative that need to be endorsed in the areas of Evros Basin. Evidently one could not expect to introduce in the study area an "active land policy" agenda like in the case of the long-standing tradition of the Dutch system, but the Belgian policy of the "signal areas", could provide a stimulus for developing similar initiatives. What's more, it does appear as an urgent quest to re-valorizing the existing legislation in Greece on pre-emption rights, which exists, but has not found yet effective implementation especially in safety policies. Conclusively, while scholars and decision makers stress the need for environmental monitoring, hazard mapping and the development of risk management plans alongside Evros Basin (Poulos *et al.* 2022, Perrou *et al.* 2017), it is strongly argued here that a broader resilience approach is required, allowing to integrate socio-economic priorities, risk mitigation and environmental concerns into concrete land policies paving the ground for safe spatial development trajectories. All these in combination further denote the necessity to readdress the attention to the role of land policy in the country as a whole, to elaborate on the merits of available tools and to systematically search for rebuilding links with spatial and safety planning.

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