

Comparative Thoughts on German and Hellenic Urban Planning and Property Registration

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Abstract

Land-use planning and registration of property rights are considered to be the fundamental land tools to support sustainable development of land and thus to contribute to the control of informal urban development. This paper concentrates on the topics of land use planning, land registration and real estate cadastre including their mutual interrelationships, as these are applied in two EU countries: Germany (with practically no informal development) and Greece (with long experience in dealing with informal development). The procedures for the provision of residential land are described and compared, as is the role of the cadastral systems in the urbanization process. Examples of good practice and experience according to the specific local historic, social, and economic situation of each country are given. Interrelationships of land use planning, of building construction and development activities and of land parcel documentation (parcel location, parcel size, building location) in the cadastral system, are shown. The German local land use planning and urbanization process which results in legally binding land use planning documents are discussed. A look is given to the technical developments which currently take place in all mentioned fields. Specific reference is given to ALKIS, the new German IT standard for the real estate cadastre system and the XPLANUNG, the new IT standard for urban land use plans which is currently under development. The Hellenic procedures for urban planning and the modern Hellenic Cadastre system and its current projects made to support the real estate market and sustainable land development are briefly investigated. The complex phenomenon of informal land development in the suburban areas and the coastal zone of Greece is thoroughly analyzed, and proposals for an improvement of the related administration and legislation are given. Similarity of procedures and regulations of the German and Hellenic systems and distinctness of results in the development of land, together with some proposals and lessons that may be useful for other countries facing similar informal development problems, are outlined in a concluding section.

1. INTRODUCTION

Development plans and zoning regulations affect the property rights, the real estate prices, and the land market's function. For that reason usually modern land administration (cadastre) systems are updated when such developments take place. Land use zoning involves the compilation of urban plans and the reallocation of the land-use rights in ways that should satisfy the common needs and improve the physical environment. Cadastral maps and property rights, provided by land administration authorities, are the fundamental tools to facilitate the compilation and implementation of urban plans and the necessary compulsory land acquisition and reallocation of ownership rights in land. Cadastral data have an impact on land-use planning and vice versa. In a way land administration systems provide the necessary infrastructure for planning and monitoring the development of land.

Within European countries both planning and land administration systems vary considerably. Land administration systems vary in terms of automation, content, administrative structure, scope, market needs approach and business structure, and completeness (UN/ECE WPLA, 2005). Planning systems also vary in terms of centralization or decentralization structure, the role of the public and private sector, their scope, maturity and completeness (Enemark, 2007; European Commission, 1997). The distance between expressed objectives and outcome of planning systems, though, vary as well. This to a great extent can characterize the success and propriety of these systems; in some parts of Southern Europe, there is still a considerable extent of unplanned or informal land development, and in Central and Eastern Europe (in countries in transition) this phenomenon is rapidly growing.

“Unplanned”, “informal”, “illegal”, “unauthorized” or “random” urban development, though, is an issue of major importance in a large number of countries worldwide (Sims et al, 2003). The main environmental and economic factors for characterizing a settlement as “unplanned” or “informal” are: inefficient land tenure, poor quality and size of construction, lack of access to services, and absence of land-use zoning or distance between zoning regulations and the actual land development. The common reasons for unplanned development whether in regions of Europe, Africa, Central and Latin America, or Asia are: insufficient planning or unrealistic zoning regulations; inconsistent and complex legislation related to property rights and zoning regulations, which creates difficulty both sides involved, e.g., to the constructors/ entrepreneurs and to the public administration ; illegal subdivision and construction on agricultural lands; lack of reliable spatial data infrastructure; unnecessary bureaucracy for land development and permitting; marginalization, poverty and lack of financing mechanisms for affordable housing; and political reluctance to confront the situation (Potsiou et al, 2006).

Planning and land administration infrastructure together with land consolidation, reallocation of land, land valuation, and other land reform procedures are considered to be important land tools for the management of land, the process of putting physical resources of land to good effect (UN/ECE WPLA, 2005). Land management decisions though are often regulated by different agencies (e.g., those responsible for agriculture, forestry, mineral extraction, real estate management, urban planning, utilities and services) resulting from different interests and land policies.

The authors of this paper believe that the sustainability, applicability and propriety of such land tools, procedures and regulations highly depends on a complex set of local parameters, which vary in the varying countries; thus, the efficiency of such tools should be frequently judged and revised according to their outcomes in the local environment. It is advisable that mechanisms should be put in place to ensure consistency in their implementation, so that applied land policies will meet the social and economic objectives of each country.

This study makes a comparison of planning and land use controls and their interrelation with the property registration systems between two European Union countries, Germany which has very rare areas with informalities in land development, and Greece which still has to face the problem of unplanned suburban growth in the fringe of the big cities and the coastal zone. It is shown that although these two countries have similar fundamental legislation and principles for planning and property registration issues (Greece has adopted very strict regulations and planning procedures in order to protect the environment and achieve high standards of land development), due to the differences in their economic conditions, administrative structure, availability of reliable spatial data infrastructure, efficiency of the public

administration, cultural, social and historic background, the output of these systems differs.

In the following it is shown that planning and land administration systems and urbanization processes adopted in both countries follow similar procedures. Both systems are planned under similar philosophy, e.g., there is little flexibility in decision making to allow land development that is not in line with the valid planning regulations (Enemark, 2007). Yet, there is a big difference in the degree of informal or unplanned development in practice between these two countries; in Greece there is still a considerable discrepancy between the planning regulations and reality. Some of the reasons for the creation of these differences are investigated below, and conclusions are drawn useful both for Greece and for other Eastern European countries which face similar problems.

The research made by this paper aims to demonstrate the complexity of the phenomenon of unplanned or informal development and to show in a tangible way that there is no single solution in planning procedures, which is suitable for all countries, to prevent informal construction. Some of the objectives of this research are: to emphasize the need for coordination in land management decisions and land related projects e.g. planning, urban regeneration, land consolidation, land administration projects; to stress the importance of creating reliable spatial data infrastructures; to show the need for revising the adopted land policies when the local economic objectives and needs are changed; to encourage the citizen participation; and to support knowledge and information sharing with other interested countries facing informal urban growth issues. International trends and good practice are also important when implementing land use planning systems.

2. PLANNING AND LAND-USE CONTROLS

2.1 Principles and Levels of Planning in Germany

The basic rules of urban planning in the Federal Republic of Germany are defined in the Federal Building Code (Federal Building Code; Federal Ministry of Transport, Building and Urban Affairs). According to the Code, the purpose of land-use plans is to support sustainable urban development and a socially equitable utilisation of land, and to contribute to securing a more humane environment and to protecting and developing natural life. More specifically, the preparation of land-use plans particularly has to cope with the following items:

- the general requirement for living and working conditions and the safety of the population,
- the housing requirements of the population,
- the social and cultural needs of the population,
- the preservation, renewal and development of existing

local centres [Ortsteile] and to the shaping of the town- and landscape,

- the requirements relating to the preservation and maintenance of cultural heritage,
- the requirements of Churches and religious organisations,
- the requirements of environmental protection,
- economic requirements, with respect to medium-sized companies, the requirements of agriculture and forestry, of transport including local public transport, of the postal and telecommunications services, public utilities, and the protection of natural resources and the preservation, protection and creation of employment,
- defence and civil defence requirements,
- the results of other urban planning measures.

In the whole process of preparing land-use plans, public and private interests are to be duly weighed.

Procedures of urban land-use planning [Bauleitplanung] are defined in detail to prepare and control the use of land within a municipality, mainly for buildings. The results of urban land-use planning are documented at two different levels, namely in

- the preparatory land-use plan [Flächennutzungsplan] and in
- the legally binding land-use plan [Bebauungsplan].

According to the Federal Building Code (Section 34), the normal case is that the erection of new buildings or the redesign of existing buildings is permissible within Built-Up Areas. Prerequisites to be fulfilled to get the building permit are, that in terms of the type and scale of use for building, the coverage type and the plot area to be built on, the building proposal blends with the characteristic features of its immediate environment and the provision of local public infrastructure has been secured. The requirements of healthy living and working conditions must be satisfied; the overall appearance of the locality may not be impaired.

In the same way the normal case is that Building in the Undesignated Outlying Area is prohibited. However, there are exceptions from this rule (Section 35), if, for instance, buildings will serve agricultural or forestry activities and occupies only a minor proportion of the total plot, if buildings will be dedicated to public supply of electricity, gas, telecommunications services, heat and water or for sewerage, if it is intended to be used for research and development into nuclear energy for peaceful purposes or for the treatment of radioactive waste, or for research, development or use of wind or water-powered energy sources. Buildings in such areas may only serve the specified purposes; residences are strongly restricted to the Built-Up Areas and are not permitted in the outer areas. There are very few exceptions from this rule like farms, for instance, where the farmers may live to do their agricultural work on the surrounding land parcels.

The preparation of both kinds of land-use plans is in the responsibility of municipalities which, therefore, play the most important role in German land-use planning. The plans

have to be created in line with the aims of comprehensive regional planning, which, on its part, has to follow the general planning rules as given at the Federation level by the Federal Regional Planning Act [Raumordnungsgesetz]. The Regional Planning Act contains the very general principles and overall concepts of spatial planning in the Federal Republic of Germany. At the Federation level mainly spatial planning reports are submitted (Fig. 1), whereas the more specific planning activities take place at the lower spatial planning levels.

The municipalities estimate the demands for new urban land in the context of their regular spatial planning activities. Preparatory land-use plans which provide for the general planning strategy are updated in a 10 to 15 years interval; legally land-use planning is being performed continuously. The area of one legally binding land-use plan typically covers an area of 5 to 30 hectares thus providing housing capabilities ranging from less than 100 persons up to several 1000 persons.

The whole process of the legally binding planning procedure for a specific area typically takes 1 to 2 years. The municipalities have a strong interest to attract new inhabitants because the municipality's share of the total states' taxation income depends on the number of inhabitants. On the other hand the municipality is obliged to provide for the local infrastructure in the area where a legally binding land-use plan exists as soon as the plan is put into force.

This concept leads to a generally well balanced continuous offer of new urban land all over the country. Table 1 presents the different spatial planning levels in the Federal Republic of Germany, the Federation level, the Federal State level and the Municipality level which is linked to the Federal State level via intermediate Regional Planning activities.

Table 1. *German Spatial Planning levels*

Spatial Planning level	Responsibility	Medium
Federation level Spatial planning	Federation (Federal Ministry for Transport, Construction and Housing)	Federal Regional Planning plan
Federal State level Regional planning	Federal States' Ministries, allocation according to federal state government plan	Federal State Development Plan
Federal State sublevel Regional planning	Federal States' Ministries, allocation according to federal state government plan, planning associations	Regional plan Scale 1/25.000, 1/50.000
Local level urban land-use planning • preparatory • legally binding	Municipalities	preparatory land-use plan scale 1/5000, 1/10000 legally binding land-use plan scale 1/500, 1/1000
Sectoral planning	Sectoral planning agencies for road construction, private enterprises etc.	Sketch planning and authorization planning

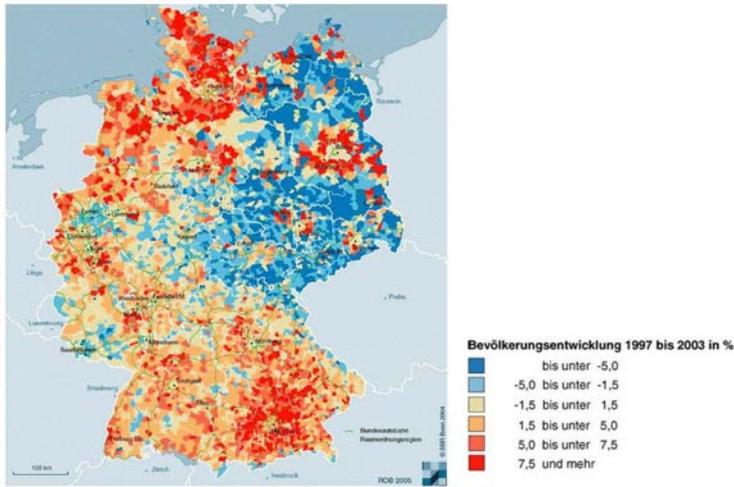


Fig. 1. Population development in the Federal Republic of Germany (Source: Spatial Planning Report 2005, Federal Office for Building and Regional Planning)



Fig. 2. Population development in German Federal State Rhineland-Palatinate (Source: Federal State Development Plan Rhineland-Palatinate, Federal State Ministry of the Interior and of Sports)

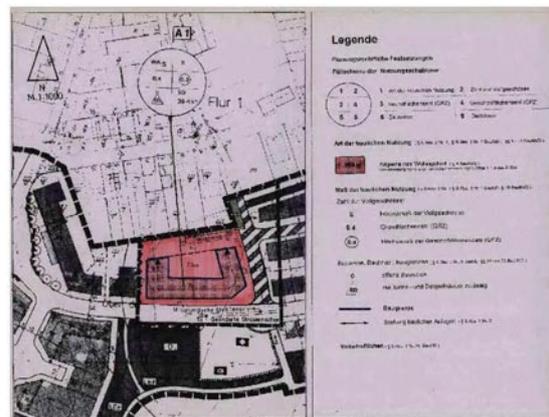
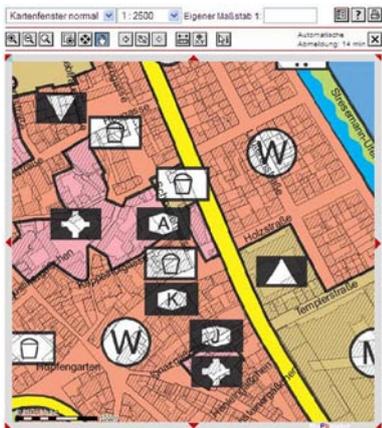


Fig. 3. Preparatory land-use plan (top) and Legally binding land-use plan (bottom) (Source: City of Mainz)

Figures 1 to 3 show plans in the form in which they are created at the different planning levels. The binding character of planning specifications increases continuously from the top level to the bottom level. At the Federation level only the general strategies are defined, whereas the legally binding planning results are being produced at the local municipality level. Particularly for the planning steps resulting in legally binding requirements for buildings the participation of public agencies as well as of the general public is regulated very much in detail.

2.2. Principles and Levels of Planning in Greece

Spatial and urban planning also in Greece is a fundamental tool for decision making to define strategy for land development and to secure economic growth, social stability, environmental protection and quality of life. It is ruled at national level, by a unified legislative framework and regulations that are the basic tools, together with the Hellenic Cadastre (on-going project since 1995) and the land and property taxation system, aiming to create sustainable settlements which will be well integrated into the natural environment and the cultural heritage of each area.

Laws 360 of 1976 and 2742 of 1999 with their amendments constitute the basic legal framework that rules the procedures for applying land policy and spatial planning in Greece (Potsiou & Apostolatos, 2006). Despite the long effort and several administrative reforms the procedures for applying spatial planning are still costly and time-consuming. The process, started in 1999, for the definition of zoning regulations at regional level include several steps:

- decision by a multi-ministerial Committee for the Coordination of Governmental Policy in the Field of Spatial

Planning and Sustainable Development,

- approval of the decision by the National Council for Spatial Planning and Sustainable Development,
- compilation of the “General Regional Framework for Spatial Planning and Sustainable Development” study, which defines the general land-use zoning for each one of the 13 administrative Regions of Greece (administratively, Greece consists of 13 Regions, 52 Prefectures and approximately 1000 Municipalities). Fig. 4 shows by example the General Regional Development Plan for the Region of ‘Sterea Hellas’, and
- compilation of the Regional “Special Framework for the Spatial Planning and Sustainable Development” study, which defines specific land-uses for each Region.

These General and Special Framework for Spatial Planning and Sustainable Development studies define in a general manner the land-use zoning in the Region.

The General Regional Framework for Spatial Planning and Sustainable Development studies for 12 of the 13 Regions of the country (except Attica) were legislated (and published in the Governmental Gazette) in the period October 2003 – February 2004, while currently the study for the “National Spatial Plan for the completion and enactment of the General Framework for Spatial Planning and Sustainable Development” is being compiled. “Special Framework for the Spatial Planning and Sustainable Development” studies, for various sectors of activities e.g., coastal zone, tourism, etc., have yet to be completed and ratified.

Attica and Thessaloniki, the two largest Regions of Greece, are governed by special spatial planning procedures. In particular, Law 1515 of 1985 with its amendments defines the Regulation Plan for the spatial planning of the greater area of Athens and in general for the Region of Attica. Through this law the responsible agency (Organization of

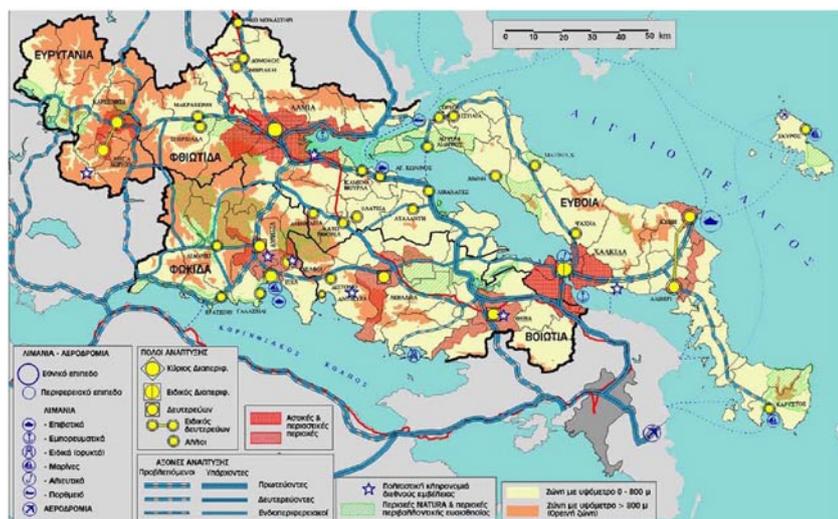


Fig. 4. Regional Development Plan from the General Regional Framework for Spatial Planning and Sustainable Development of the Region of ‘Sterea Hellas’

Planning and Environmental Protection of Athens) was also established for the spatial organization of Attica named the “Strategic Spatial Plan” study, the regional structure of the production sectors, the permitted extension of urban areas, the transportation system and other technical infrastructure, land policy and housing, zoning of specific interest or other special problems, and environmental monitoring and protection, etc.

The relevant issues that refer to the Region of Thessaloniki are ruled by Law 1561 of 1985. The National and Regional Spatial Plans and the environmental protection programs ratified by the above mentioned laws are completed, specialized, clarified and amended by Presidential Decrees which are published after a proposal by the Minister for the Environment, Physical Planning and Public Works.

Publication of such Presidential Decrees is a complicated and time-consuming administrative and legal procedure for which, first, a series of other ratifications and consultancys are needed by several agencies and legalized bodies, and second, the ratification by the Council of the State, the highest court of the state, is required.

The building regulations in Greece are defined by the Hellenic General Building Code (GBC), which in general follows similar principles with the German Code.

Urban land development in Greece was first ruled by the Housing Law enacted in 1923, according to which urbanization of new areas was made in two steps. The first step was the compilation of the urban planning study; the second step was a sporadic implementation of this study, according to the interest of the individual owners or the municipality. This approach was not considered to treat all owners in the whole area under urbanization in a fair and equal way, since the plan was applied without a land reallocation procedure; each owner did not contribute with land according to a percentage of his/her total original parcel area, but according to the specific needs, at the spot, for common space in the very narrow neighborhood of his/her land parcel.

Housing policy, urban planning and urbanization of new areas, including environmental protection, was totally changed in Greece by the Laws 1337 of 1983 and 2508 of 1997 and their amendments. Since then, integration of new areas into a formal urban plan is only accomplished through the following procedure.

First, the compilation of the “General Urban Plan” study (at a scale of 1:10,000) is needed, which defines the location, size and boundaries of all areas dedicated for urban development (definition of Built-up areas) and the zoning regulations for the urban and suburban areas of the Municipalities, which have big cities; or the compilation of the “Plan for the Spatial and Housing Organization of the Open City” study (at the same scale) for all urban parts and their connecting areas of the Municipalities, which have smaller populations. Figure 5 shows an example of a “General Urban Plan” map for a Municipality close to Athens. Revision of these plans must not happen before the passage of 5 years.

The “General Urban Plan” or the “Plan for the Spatial and Housing Organization of the Open City” have to be created in line with the spatial plan of the Prefecture, which on its part has to follow the general planning rules as given above, and in particular the “General Regional Framework for Spatial Planning and Sustainable Development” of each Region, which is in the responsibility of the Ministry for the Environment, Physical Planning and Public Works.

Only those areas, which according to the above plans are dedicated for urbanization, can proceed to the next stage which includes (Fig. 6 shows the flow chart of the urbanization process):

- Compilation of the detailed “Urban Plan” study. The term “urban plan” refers to a formal set of rules and plans, which define the zoning and building regulations to be applied on both the private plots and the plots selected for common use and common benefit activities. This study includes the compilation of the plan (blocks, road network, common spaces, etc.), at a scale of 1:1,000, and the urban regulations (e.g., coverage, floor ratio, maximum building height, etc), and of all necessary additional studies (definition of the coastal line, compilation of forest maps, archaeological site plans, geological and hydrological maps, etc). Fig. 7 (left) shows a product of an “Urban Plan” study.
- Ratification of the “Urban Plan” by a Presidential Decree.
- Compilation of the “Urban Planning Implementation Act” for each of the above areas. This study refers first to the compilation of the necessary cadastral surveys and the adjudication of current owners, due to a lack of a Cadastral maps in Greece. This constitutes a major difference between the German and the Hellenic procedures, which causes longer delays. The long existing System in Greece for the security of tenure called “System for Registration of Transfers and Mortgages” keeps reliable records of deeds and all property related legal rights and mortgages, but with poor spatial reference; only 10% of the jurisdiction has updated digital cadastral maps and inventories produced since 1995, for the on-going Hellenic Cadastre Project (Potsiou et al, 2002). Then, a land reallocation process follows; the rearrangement of plots in terms of location, shape and size, according to the proposed “Urban Plan”, for the creation of the necessary common use land for open space and services (schools, clinics, parking space, sports, parks, etc); and distribution of the new plots to the owners. Fig. 7 (right) shows an example of such a plan.
- Ratification of the Urban Planning Implementation Act by a Prefect’s Decision.

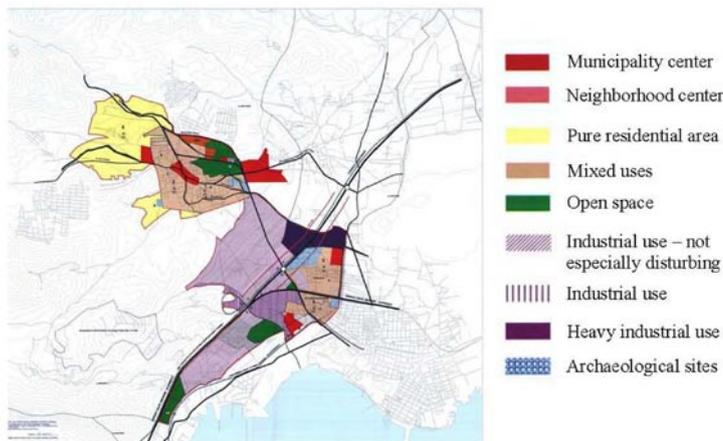


Fig. 5. General Urban Plan for the municipality of Mandra, in Attica, dated at 2003

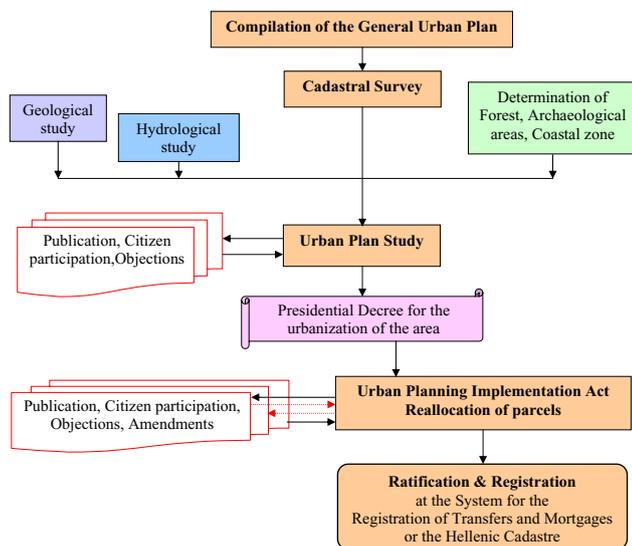


Fig. 6. Flow chart of urbanization process in Greece



Fig. 7. "Urban Plan" map (left) and "Urban Planning Implementation Act" map (right) from the urbanization process of an area of the municipality of Mandra, in Attica

Construction in areas outside the “urban plan”, usually agricultural or arable land, is permitted in Greece, unless there is a specific restriction. This constitutes a major difference between the German and Hellenic approach. Since 1923, the minimum parcel size required for a legal building permit in an area without an urban plan is 4,000m², with a minimum parcel frontage of 25m on a common-use land. In addition there must be a 15m building setback, and the maximum permitted land coverage is 10%. For areas within a zone of 500m from an existing formal urban plan the minimum parcel size becomes 2,000m². Construction is prohibited in the forest land, the coastal zone, or natural beauty or cultural heritage protected land. The costs for services provision (if possible) e.g., electricity, water supply and telecommunication services, are paid by the land-owner; municipality does not undertake any costs for providing any infrastructure to constructions in areas outside the “urban plan”.

The “General Urban Plan” or the “Plan for the Spatial and Housing Organization of the Open City”, the “Urban Plan” study, its “Implementation Act” and the reallocation of land, are in the responsibility of the municipalities, who estimate the demands for new residential land. In order to provide new residential area, the municipality has to proceed in the compilation of a new “Urban Plan” study; the “General Urban Plan” or the “Plan for the Spatial and Housing Organization of the Open City” must pre-exist and must include the area under urbanization; otherwise it has to be compiled or revised so that it will include this area. In Greece municipalities are centrally dependant, and they have a strong interest to attract new inhabitants, like in Germany, because the municipality’s share of the total states’ taxation income depends on the number of inhabitants.

The municipalities in Greece have to undertake a big share of the expenses for all necessary studies, their implementation, and the provision of services and land improvements, so the urbanization process becomes very slow. It is estimated that, the completion of all stages including compilation of “Urban Plan”, its ratification, compilation of Urban Planning Implementation Act (compilation of cadastral surveys and reallocation phase) and its ratification by a Prefect’s Decision, needs an average time of 8 years, assuming that the “General Urban Plan” already exists and allows the urbanization of the particular area.

2.3 Urbanization Procedures

In this chapter procedures followed in both countries for the urbanization process like the reallocation of land, rectification of public registers and provision of local public infrastructure in new urban areas are investigated.

2.3.1 The German Approach

Within the area covered by a binding land-use plan, land can be reorganised through reallocation to create plots suitable in terms of location, shape and size. To implement the binding land-use plan the municipality has to perform reallocation of land. The municipality may transfer the preparation of the decisions to be made within the reallocation procedure and any land survey and cadastral tasks required for the implementation of reallocation to publicly appointed surveyors.

Involved in the process of reallocation are the owners of the properties located within the reallocation area, the holders of a title entered or not in the land register, the municipality, public agencies, particularly those charged with the provision of local public infrastructure.

The reallocation process starts with the production of an as-built map and an inventory of the plots contained within the area for reallocation. The map shows the current position and shape of plots within the reallocation area with building lines, and identifies the owners. The inventory states for each plot the registered owners, the description given in the land register and the land survey register, the size and use for plots as indicated in the land survey register [Liegenschaftskataster] with street names and house numbers, and the charges and restrictions registered in the land register.

The complete reallocation mass is calculated by adding the area of all plots located within the area for reallocation. From this number those spaces dedicated in the binding land-use plan to public infrastructure, like local roads, paths, for public open spaces and for collecting roads, spaces for car-parking, public green spaces including children’s playgrounds, for purification and overflow basins for rainwater have to be subtracted. The remaining mass constitutes the redistribution mass [Verteilungsmasse]. Calculation of the share of the redistribution mass due to each property owner involved is to be based on either the relative size or the relative value of the former plots prior to reallocation. Regularly, the distribution nowadays is being done on the basis of value rather than on size.

The final reallocation plan is to be prepared following a resolution and after discussion with property owners. The plan must indicate the new utilisation proposed, stating all actual and legal changes. The form and contents of the reallocation plan must be suitable for adoption within the land survey register. The reallocation plan comprises the reallocation map and the reallocation inventory.

Depending on the number of formal objections and on other legal procedures the whole reallocation process can be rather short – below one year – or can be very time-consuming.

The results of the reallocation process are forwarded to the land registry office [Grundbuchamt] and to the office responsible for keeping the land survey register where the changes in the land register and in the land survey register are

recorded. As a basic principle all buildings, if residential or economic, have to be recorded in the German real estate cadastre. In a new built-up area all buildings are recorded after construction in the cadastre either on application or officially. The construction of buildings has to follow the general rules as given by the legally binding land-use plan and, moreover, has to meet specific building permits. Permits for new buildings are being granted on the basis of individual construction plans for the buildings. When the construction is completed an officially approved construction supervisor has to confirm that the building was erected in conformance with the individual building permit which was granted for it.

Municipalities have to provide for the local public infrastructure and for road access. Regularly, the municipalities by contract delegate the provision of local public infrastructure to a third party. Charges are collected for the provision of local public infrastructure, like public roads, paths and public spaces, parks and green spaces and so on. The charges have to cover the costs for the acquisition and preparation of spaces for local public infrastructure; the initial construction including installations for drainage and illumination and the adoption of existing structures as part of the municipal local public infrastructure. At least 10 per cent of the legitimate charges for land improvements are to be borne by the municipality. Charges for a unit of local public infrastructure are spread over the plots serviced by this infrastructure. The criteria, which also may be linked, for allocating charges are the type and extent of use for building or otherwise, plot area and the width of the plot adjacent to the infrastructure facility, like a public road, for instance.

The land owners, therefore, have to contribute to the land urbanization process with a share of typically 20 to 25 percent of the original plot size for public purposes: they have to cover 90 percent of the costs for the local infrastructure, typically 60 to 70 € per m² of the final reallocated plots. On the other hand the land owners benefit from a typically considerable raise of land value which results from the land-use change from agricultural to urban land and which often exceeds the costs by far.

2.3.2. The Hellenic Approach

As already mentioned, reallocation process is also applied in Greece, in order to implement the "Urban Plan". These tasks are commissioned by the municipality to the private sector. The work has to be compiled according to the technical specifications (e.g., reference to the national datum, accuracy requirements, creation of Data Base and GIS) pre-defined centrally, by the Ministry. This procedure is called "Urban Planning Implementation Act" and it includes the compilation of the cadastral survey, the reallocation process, and the redistribution of remaining private land to the property owners. Reallocation process in Greece follows

similar steps with the German approach, so it is not described in details. Long delays are caused by the compilation of the necessary cadastral maps and data (field surveying and the adjudication of owners), since as mentioned above such data are not available for the 90% of the jurisdiction. Since a cadastral survey of the current situation and a land reallocation must be undertaken, through which the location, shape and size of parcels are first identified and then changed, broad public participation allowing objection submissions is necessary to guaranty transparency about the correctness and changes made.

As in Germany, the duration of this phase depends on the complexity and number of objections. Yet, in Greece there are two types of objections: on the cadastral survey products (maps and inventories) and on the proposed reallocation of land (location, size, value). Also, reallocation of land in Greece is a much more complex and difficult procedure due to the existence of many buildings in the area under urbanization process.

Citizen's participation in land management procedures has the advantage of transparency, allows all real estate participants to have equal and easy access, and creates an administrative method for solving disputes (UN/ECE WPLA, 2005). Moreover, especially in applying an urban planning study it can prevent conflict that may appear during the land reallocation process, so it is considered to be of significant importance, although it may create long time delays. Citizen's participation in Greece in the above described procedures (Fig. 6) is achieved at two levels: through the elected local authority representatives and through a procedure open to the public. When each study is prepared, local authorities have the right to criticize it and make proposals; the study is then published openly to the public for information and transparency. The procedure includes an "objection submission phase" by the owners, objection examination by an administrative committee, corrections or amendments of the study's products, and a new open publication. This may necessarily be repeated several times until the data will be finalized and the new owners will be registered at the land registry (System for the Registration of Transfers and Mortgages) or the Hellenic Cadastre (new land administration system in Greece).

Reallocation and distribution of new plots is based on the relative value of the former plots prior to reallocation.

The results of the land reallocation process (inventory) are forwarded to the land registry office, where the changes are recorded. Reallocation cadastral maps are kept together with the urban plans at the Urban Planning offices at the municipalities, but contrary to the German practice, this information is not maintained and updated by the responsible Hellenic agencies whenever new changes happen in the area. Construction of buildings has to follow the general rules as given by the "Urban Plan", and has to meet the specific building permits. Permits for new buildings are being granted on the basis of individual construction plans for the buildings.

Unfortunately in Greece there is no systematic supervision of each individual construction for an occupancy permit (only random inspections are made) to confirm that it is erected in conformance with the individual building permit. This results to plenty of informalities even in areas within an Urban Plan. In addition, new buildings are not recorded after construction. So, after several years the produced (during the urbanization process) cadastral maps don't have much practical value. It can be said that unfortunately in Greece there is still poor coordination between land-related public agencies, leading to duplication of projects, delays and increase of costs of these land tools and methods. An example of such duplication of data collection is the fact that new cadastral surveys are being compiled in urban areas in order these areas to be integrated into the "Hellenic Cadastre" project; another example of lack of coordination between relevant projects is the fact that in some areas both projects may happen to be under compilation at an overlapping time period (urbanization project and integration into the "Hellenic Cadastre"), thus collecting similar data.

During land reallocation process in Greece, like in Germany, each land owner must make a contribution of land (a kind of obligatory land expropriation); the contribution is defined as a percentage of the total plot size area the owner owns in the area under urbanization, according to a classification of sizes; e.g., one who owns plots of a total size up to 250 m² must contribute 10% of his/her total area, while one whose total plots size is over 2000m² must contribute 50% of his/her total area. The above rates vary according to a classification of area types as well, e.g., whether the area under urbanization is planned to be a "first-house residential" area, or a "vacation" area - because usually there are different land demands for planning common activities in these two categories- or when the population of the municipality is less than 2,000 citizens.

The owners in the area under study must contribute money, as well (in a one-time payment) as "impact fees" for the provision of land improvements, and the necessary infrastructure and services provision. Also, when a parcel cannot contribute the necessary land area according to the regulations (due to the Urban Plan design in the parcel's neighborhood) the owner has to contribute more money instead. Nevertheless, according to the existing general land policy issues in Greece, which is also interrelated with the countries economy and the land and property taxation centrally collected by the state, contrary to the German approach these fees are usually very low, totally irrelevant to the cost of these works. So, the state/municipality undertakes the remaining expenses, a system which has a social benefit but which also makes the supply of new residential land an expensive and very time consuming process for the state/municipality, thus resulting to long delays in providing new residential land, and finally to unplanned urban development.

Yet, although after land reallocation an owner's new property is smaller than the total size of the properties the

same owner had before, the land value of the new property is much greater than the value of the properties before urbanization. So, due to the fact that a building permit can in these areas be issued also for small parcels (usually of minimum area size 250-500m²), and to the infrastructure and environmental improvements after urbanization, the particular owners may realize a big profit. In any case the state undertakes the majority of infrastructure costs while the particular owners finally may end up with a profit.

It can be said that such policies result in equal sharing of the cost of the new infrastructure built at new urban areas in general, among all city landowners (Bruckner, 2001), or in fact among all Greek citizen who pay land and property taxes. Such policies have served well specific economic objectives, under certain circumstances in the past, for achieving an even nation-wide land development and growth and have provided control for centrally planned land development. According to authors' experience such policies should be modified according to major international trends and the new specific economic and social changes in the local environment.

3. INFORMALITIES IN URBAN DEVELOPMENT IN GERMANY AND GREECE

3.1. Informalities in Urban Development Germany

For reasons which mostly are beyond the scope of this paper informal settlement at a larger scale can not be found in Germany. One of the reasons might be that the grant of building permissions and the final inspection, take place at the local administration level. A so-called publicly well known 'red-dot-poster' which contains important information concerning the type of building to be erected, the owner of the building, etc. comes together with the building permission document. This poster has to be presented at each construction site all over the construction time period. Normally, the local public has a strong interest to prevent the environment from unauthorized building activities. Consequently, monitoring of construction activities is being done on a regular basis by the local public, like local mayors, council members, neighbours.

Still in some rare cases informalities may arise over time. Some settlements which originally were designed only for occasional use as weekend houses over time evolved into settlements used for permanent residence. In rare cases some small scale settlements are legalized once built by passing the regular urban plan development procedure.

Moreover, some small scale informality exists concerning non-permitted use of buildings for residential use in the outlying space areas, for instance. Informal building construction is not completely unknown in Germany, as well. Upgrading of existing buildings by extending them in size or in height to

make them more suitable for residential use without applying for building permissions takes place. Also, not in all cases the real construction strictly follows the construction plans which are part of the building permission document.

3.2. Informalities in Urban Development in Greece

In Greece, like in most other countries with lower economies (Dowall, 1992), land development has always been regulated by very strict, unrealistic regulations for the local economic parameters, the housing needs and the capacity of the relevant public administration to supervise development. As it happens in several other countries, due to similar reasons, illegal subdivision and conversion of agricultural land into residential land by the low-income settlers has long been a common situation in Greece (Potsiou & Ioannidis, 2006).

Available housing within a legal “urban plan” was affordable only to those who earned at or above the average household income. Land prices in fringe areas without an “urban plan” were, and still are, much lower than in the city due to long commutes, traffic congestion, and lack of infrastructure. Such fringe areas of lower value are usually zoned as agricultural land; in some cases it may be designated as industrial zones. Due to an absolute lack of affordable housing policy in Greece, those earning less than the average turned to the informal sector. Construction on agricultural land, illegally subdivided, is not allowed; so, very often houses are built on private land but without legal permits.

The majority of these informal constructions though has always been of good quality, permanent type, and can be characterized as “low-cost housing” and usually was not demolished. Since these settlements are not considered as threats to public safety and health but as a valuable capital asset which should find its way to the market (de Sotto, 2000), a legalization process-where possible- with a parallel integration into a plan has to take place. Conversion of agricultural land to residential use though in Greece can only occur through an update of the above mentioned “General Urban Plans”, while a sporadic conversion is not legally possible. During the last 20 years only 419 General Urban Plans were ratified in Greece, representing 2,000 urban units. From the above only 50% of their areas have become urbanized; in the remaining areas the procedures are still pending, while in others the procedure has not even started.

Existing unplanned development is always a problem during the urbanization process of such areas. In many cases, instead of adjusting the area to the urban plan, the urban plan has to be adjusted to conform to an existing “densely build-up” situation. The result may be the creation of narrow roads, lack of common space, insufficient infrastructure, etc. Even though, the integration of such areas into the formal “urban plan” has legalized existing informalities where possible, has provided the necessary standards of infrastructure

and services and avoided the creation of slums or of areas with a high level of decay in terms of housing and social indicators. According to the General Building Code (article 22, Code 85) informal buildings can be legalized after a building permit has been applied for and issued, and after the charged penalties have been paid. The building permitting procedure is the same as that followed for legal buildings; all necessary studies and plans (static efficiency, etc) must be submitted. No informal building can be legalized until its efficient construction is guaranteed; if necessary, additional empowerment initiatives will be made. Penalties vary according to the use and size of the construction.

Excepted from the legalization process are constructions leading to general environmental burdening, e.g., building on public land, river routes, floodplains, coastal zone, archaeological sites, forests and high risk areas. These may never be legalized. However, some informal construction according to the Law is shown to exist on “forest land”, but much is related to the very strict, old and unrealistic definition of “forest land” in Greece (Potsiou, 2006). As has been noted by several local and international experts in similar situations, informalities often exist only due to old, unrealistic governmental regulations. The solution may be to remove or revise those regulations.

For all the above mentioned reasons statistics derived from on-going projects in the Hellenic jurisdiction in the period 1985-2006 show that while the process for the “Urban Planning Study” may require 3 to 4 years, the total average time for the compilation, application and ratification of an “Urban Planning Study” and “Urban Planning Implementation Act” is, in average, 8 years. In some cases the total time may exceed 15 years due to the objections, and the legal issues.

Although penalties on informal constructions are high, even unrealistic, control and police procedures alone are inefficient. Long delays in providing residential land by market demand allow corruption at various levels. There is an economic impact due to this situation, both to the state and to the owners that should be rectified.

In the past illegal construction in agricultural land has been performed mainly by low-income settlers; more recently it has been done by people of moderate income as well -those seeking for better living conditions far from the city centers. In modern Greece, the reasons for informal urban sprawl have changed, as has happened in other developed European countries, e.g., Cyprus, Spain etc. The provision of new basic major infrastructure both by the state, (e.g., the main road and railway network at the greater area of Athens), and by the local authorities, (e.g., provision of transportation, water, electricity and sewage services, improvement of the existing road network, etc.) has made fringe agricultural areas more attractive for living than existing residential options in city areas. The centers of the cities are often overcrowded and polluted. Areas close to the sea are also attractive for vacation purposes; local as well as international real estate market participants have increased land values in such

coastal areas, while obviously the profit from agricultural products is comparatively low.

Zoning regulations that restrict the supply of land available for development, where there is a demand for land, operate to increase land prices in urban areas (Ohls et al, 1974). Land values have increased in all urban areas in Greece, despite air pollution and other environmental impact. At the same time, there is still lack of affordable housing policy. However, recently the banking system has been improved in Greece and even low-income families can have access to loans (with high interest though); low-income people buy condominiums within legal urban land at extremely high values due to the high demand; sometimes inconsistent with the level of construction quality, environmental quality, planning regulations or provided services in the area. There is big concern as to whether borrowers will ever be in a position to pay back such loans.

Unfortunately, such decision making is done with little if any consideration for its potential long term cost-effects, a situation common in many countries (Dowall, 1990). Part of the reason is the lack of all necessary information about land and real estate market, and the lack of economic spatial data (de Soto, 2000; Mayo et al, 1986).

Twenty five years after the legalization initiative through an urbanization process, urban plans have been compiled for 60,000 ha, but the process of land reallocation has been completed for only 45,000 ha, and from that only 25,000 ha have been though the legalization process with the owners of such informal buildings being registered into the System for the Registration of Transfers and Mortgages. To date 700 Presidential Decrees and Decisions have been made for this process. The owners of the remaining land have not yet been able to see their houses legalized. It is obvious that this procedure is extremely time- and cost- consuming, especially under the current economic, environmental, social and market needs.

In 2007, areas totaling approximately 12,500 ha in the municipalities of eastern Attica are under urbanization procedure. Most of the urban planning studies in these areas have reached the stage of “objection submission”, and some others have reached the stage of the “Urban Planning Implementation Act”. In some areas there are delays caused in the compilation of the necessary hydrological studies; the streams’ whole route network survey and the streams’ water management has not finished yet. Another problem is caused due to the characterization of some areas as “forest land” although unplanned urban development already exists there.

Until recently, the real extent of the problem of unplanned development has been difficult to estimate due to a lack of information. It is roughly estimated that at least one quarter of the residences recently constructed in Greece were completed without building permits. A recent estimation by the general inspector of the Ministry of Environment, Physical Planning and Public Works indicates that the informal settlements in Greece are as many as 1,000,000 residences.

The new generation of informal buildings is estimated to lie on average land parcels of 1,000-1500m² in area, each. This means that 150,000ha more should be integrated to urban plans. According to a statistical study for the period 1991-2001, approximately 93,000 legal and 31,000 informal residences were constructed each year, of which 40% are in the area of Attica. According to the available national statistical data, census 2004 (Hellenic Statistical Service, 2005), 122,148 legal residences were build in 2004 and 116,963 for the first 10 months of 2005, it can be estimated that approximately 40,000 buildings without building licenses are build every year, of which 16,000 are in the area of Attica, equivalent to the size of a small town!

4. TECHNICAL DEVELOPMENTS TO IMPROVE CADASTRE AND PLANNING TOOLS

4.1 Digital Formats of Spatial Basic Data in Germany

The surveying, mapping, and cadastral authorities of the Federal States of Germany provide for the fundamental data for spatial referencing (Spatial Basic Data) to support public, industrial and private users. Up to now the Spatial Basic Data are recorded and provided in different digital formats, namely the data of the real estate cadastre in the ALK (Automated Real Estate Map) and ALB (Automated Real Estate Register) formats, the topographic data in the ATKIS (Official Topographic Cartographic Information System) format. Other digital database inventories are also available, e.g. digital orthophotos, raster data of the topographical maps and digital elevation models.

Recently, the existing concepts to hold digital Spatial Basic data were modified. In the future, the existing information systems ALK and ALB will be integrated into one information system ALKIS (Official Real Estate Cadastre Information System).

The data models, contents and semantics were harmonized with ATKIS, the information system which holds small scale topographic data. The Digital Terrain Models (DGM) are integrated in the new data model, as well. Digital Orthophotos (DOP) currently are not yet a part of the new common application schema, but were incorporated into the overall documentation. Information on control stations is modelled in an own information system called Official Geodetic Control Station Information System (AFIS) with a separate feature catalogue. The projects AFIS, ALKIS and ATKIS are associated with each other in a common AFIS, ALKIS and ATKIS reference model (Fig. 8). The common application schema provides for the recording and management of metadata and quality data in accordance with the ISO specifications.

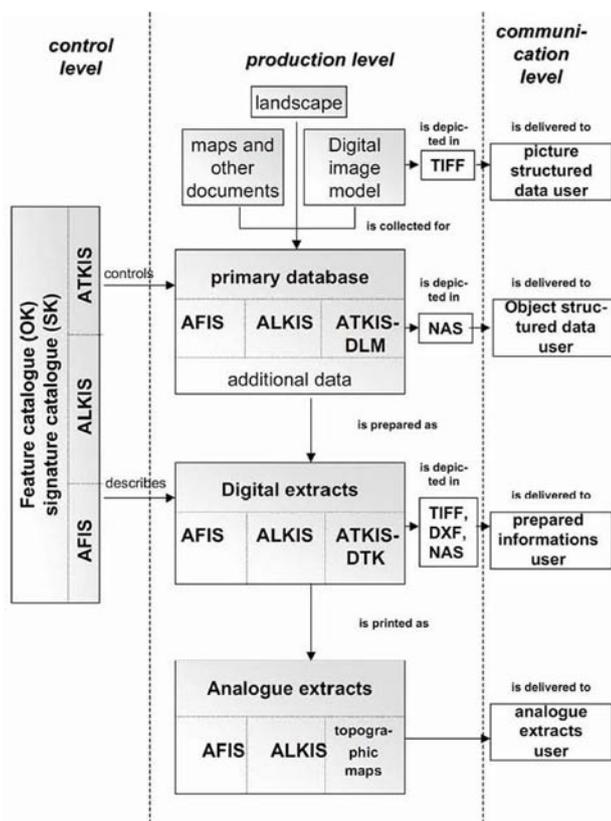


Fig. 8. AFIS-ALKIS-ATKIS Reference model (Source: AdV, 2004)

The feature catalogues of the real estate cadastre and the topographic state survey were semantically harmonised. Harmonisation is based on the previous catalogues (specimen-OBAB, list of application types, ATKIS-OK) (Düren, 2006).

4.2 E-Government Initiatives in Germany

The economic success of a county intertwines with the efficiency of its public administration. E-Government has the potential to considerably improve the efficiency of administration processes. Horizontal and vertical integration of administration processes where different administration agencies are involved is difficult at the moment because of many heterogeneous IT systems driven at the Federation level, at the Federation States level comprising 16 states, at the County level comprising more than 300 counties and at the Municipality level comprising more than 13,000 municipalities. Actually, in Germany several initiatives are in progress to improve the integrated electronic support of workflows. BundOnline 2005 (Federation Online) intends to adapt all suitable services at the Federation level to IT processing, Deutschland-Online (Germany Online) targets at the vertical integration of processes at the Federation level, the Federal

State level and the Municipality level (Deutschland-Online, 2003). The initiative MEDIA@Komm-Transfer focuses on the horizontal dissemination of E-Government specifications at the Municipality level.

Urban land-use planning associates with an extensive exchange of plans and maps between many different partners in many different planning steps (see description above). Missing IT standards for digital data exchange and visualisation of land-use plans hinder the installation of electronic services, which otherwise can support very efficiently the approval, change and use of land-use plans via Internet (Lutter, 2006). The project XPLANUNG intends to develop data models, exchange formats and visualisation standards which shall be the IT basis for future services to particularly enable access to the preparatory and the legally binding land-use plans via Internet (Forschungszentrum Karlsruhe Institute for Applied Computer Science, 2006). The work to be done with regard to semantic and cartographic modelling of the features occurring in land-use plans bases upon the existing regulations like the Federal Building Code and the regulation for the cartographic symbols to be used in the land-use plans [Planzeichenverordnung]. The object model will be described in the UML Unified Modelling Language. The data exchange format will be defined in XML/GML notation and will be closely linked to the ALKIS specification, the new real estate digital standard (Federal Ministry of Economics and Labour, Federal Ministry of Education and Research).

4.3 The Hellenic Cadastre Project

In Greece there are several agencies producing good quality spatial data information and maps at national and local level. Most prefectures and major municipalities have developed GIS applications and keep digital spatial information related to their activities updated; these data bases do not include information about land tenure and private rights. Also, the National Spatial Data Infrastructure initiative, aims to develop the necessary legislation and improve the coordination of agencies providing spatial data. Within this framework there are a number of projects under compilation mainly carried out by the "Information Society" Agency to support e-governance. An important initiative is the "e-Planning" project, which unfortunately is still at primitive stage (www.infosoc.gr).

In 1995 the nation wide project for the compilation of a modern digital Hellenic Cadastral System started; its technical details and procedures can be found in (Lolonis, 1999; Potsiou et al., 2001). Cadastral surveys compiled for the Hellenic Cadastre purposes have already covered the 6.3% of the country. In parallel, some major additional projects are scheduled to support the technical land administration aspects (Lolonis, 2006); most of them are expected to be completed by the end of 2008:

- Development of the Hellenic Positioning System (HE-POS), which is a system of 100 permanent GPS stations all over the jurisdiction connected to a central Processing Center, aiming to support the geodetic infrastructure.
- Digitization of the Land Consolidation and the Privatization of Land data, which were produced under the responsibility of the Ministry of Rural Development and Food; these data account approximately 40% of the agricultural land or 12% of the total area of Greece.
- Development of the digital database of the current owners in urban areas, registered in the System for the Registration of Transfers and Mortgages.
- Digitization of the local Dodecanese Cadastre; Dodecanese is the only area in Greece running a cadastral system since 1923.
- Compilation of very large scale true ortho-imagery (VLSO) for the urban areas (at an accuracy of 1:1,000) and orthophoto-maps at a scale of 1:5,000 for the entire country; these maps must be used to delineate the properties identified during the cadastral survey procedure.
- Preliminary delineation of forests.
- Base Maps for delineating the shore: very high resolution color-NIR orthophoto-maps (25cm GSD) and detailed (1m GSD) DTM of a 300m wide zone along the coastline.
- Modernization of the IT infrastructure of the Hellenic Cadastre
- Development of the Web-services for data dissemination and for the support of future cadastral surveys.

The cadastral surveys made for the compilation of the Hellenic Cadastre, according to Law 2308 of 1995 and its amendments, brought into light first the long existing problem of informalities in land development in relation to the public ownership claims on land long possessed privately; and second, the informal settlements on agricultural land described above.

To a large extent, the size of public owned land and real estate property is ignored by the state; usually, due to lack of staff and poor organization of the public agencies the state fails to make claims against those who illegally occupy the land. On the other hand, in many cases the state claims land ownership even without documentation, because by Law (which was put into effect 90 years ago) adverse position is not valid against public/state owned land and so individuals even when they possess the land for e.g., a 30 year period, regardless if they do so while being “of good faith” or not, can never prove ownership of this land since there is no usufruct right on any state or publicly owned land, as it happens with all other cases within the Civil Code.

Ten years after the beginning of the cadastral project, cadastral results showed that approximately 48% of the property recorded in the system so far is claimed by the state, as “forest land”, although private interests have possessed the land for several decades. This happened because the state agencies activated a law that defined the land-use as “forest land” according to conditions in 1945. According to that

law any piece of land, which can be characterized as “forest land” on the aerial photos of 1945 should be considered to be publicly owned land unless there is a chain of deeds going back to 1884 that proves that the current possessor owns lawfully that piece of land. By this, several areas, even those already within an “urban plan”, and areas within the vicinity of Athens, which were densely built upon long ago have no legal land title. Apartments that have been bought and sold several times are claimed to have no legal land title. In fact, even legalization of informal settlements through the described urbanization process cannot create a legal land title if the land is claimed by the state.

Recently, Article 4 of Law 3127 of 2003 managed to solve this problem to a great extent, in particular in areas which are already within an urban plan. In such areas the fact that the state itself had by its own activities and agencies integrated the informalities into the “urban plan”, its claim is considered to be stronger. This has created the impression that there are no ownership claims for public rights on such land. The target of that action was to protect the public-trust concept of the state for its agencies and their activities. Still, the situation is much different in areas without an urban plan where the state has not made such obvious actions that can be used as a proof of the state’s low interest in ownership rights; so the above law treats such areas much more strictly.

Areas lacking an “urban plan”, where more recent generations of unplanned development on private parcels exist, are also recorded into the Hellenic Cadastre. Despite that, the illegalities due to unplanned development are still pending, since no parallel legal reform is planned. This means that real estate market will be blocked, as transfers and mortgages will continue to be prohibited, while a modern cadastral system will be in function, which is an oxymoron. The paradox in that case is that instead of making the necessary legal reform, the state has to adjust the modern cadastral tool into the old legal framework under the practices of the previous century.

5. COMPARISONS OF TOOLS AND PROCEDURES

As it is shown in the above analysis, both in Germany and Greece similar principles rule the procedures and tools used for urban planning and property registration.

Land development in urban areas is under control by very strict urban and building regulations. Provision of new urban land, in both countries, is in the responsibility of the municipalities and is made through similar procedures which include the preparation of a plan, which defines detailed land uses and their application in the field, requires a reallocation of land for the rearrangement of land parcels according to the plan and redistribution of the new parcels to the owners. Provision is made for open space land for the necessary improvements and infrastructure. Newly created cadastral data

are registered in the property registration systems.

In Germany it is a dual long-existing system, the Grundbuch and the Cadastre. In Greece it is the System for the Registration of the Transfers and Mortgages, which exists since the establishment of the Hellenic State, but has no parcel reference; through its general reform in a modern land administration system, was it planned to include also detailed cadastral maps. The lack of cadastral maps in Greece is a big obstacle and creates extra costs and delays in the urbanization process. Moreover, the existing formal or informal development in such areas makes the reallocation process even more complicated. The created cadastral data during the urbanization process are not registered or updated. A building permit is required before any construction in both countries. In Greece new buildings are not registered and, in addition, they are not systematically supervised after their completion, allowing informalities to happen.

Owners in both countries must contribute both money and land for the urbanization of new land. Participation of citizen and involved agencies is considered to be necessary and of great value, although even in Germany, where relevant infrastructure and administration is better, this may sometimes cause long delays due to objections.

There are several other factors, though, which have a great impact on the urbanization and land administration procedures which are not similar between these two countries and which also make the results of the same procedures and tools to differ. Such factors are in brief: general economic condition; affordable housing and social policy; organization, structure and financing of public administration; available spatial data infrastructure; taxation policy; and cultural, social and historic aspects. The purpose of this paper is not to analyze and compare all these factors.

For Greece the urbanization process, which is applied for the last 25 years, is proved to be more expensive for the state and thus extremely slow. The reasons are several:

- There are no reliable and updated detailed spatial data available, e.g., cadastral maps and owner inventories, geological maps, maps showing the coastal zones, the river and stream routes, the archaeological sites. Even when some relevant data are available in other public agencies, intergovernmental coordination in Greece is still very poor and not well legislated.
- Usually in areas undergoing urbanization process, existing land development, either in a legal or an illegal form, makes the task more difficult.
- The greater percentage of the costs for the provision of all land improvements and the necessary infrastructure and services is undertaken by the municipalities and the state. In Germany owners contribute 20-25% of their land, while in Greece this varies according to the size of the parcel. Parcels up to 1000 m² contribute 30%, while larger parcels contribute 50%, to satisfy the great demand for common land. The impact fees required in Greece are unrelated to the real costs, while in Germany impact fees

represent 90% of the costs.

- Areas under urbanization, where unplanned development exists, are usually large; could be even areas of 200-300 hectares. In Germany new urbanized areas are comparatively smaller, usually of the size of 5-30 hectares each. Comparisons about the necessary compilation times cannot be made easily. It is certain, however, that the necessary times in Greece are much longer.
- Public administration is not as well organized as is in Germany, which does not allow thorough supervision of land development. The monitoring of illegal construction in agricultural suburban areas, and the charging of penalties, is only made after reporting by neighbors, which occurs infrequently in Greece. Most neighbors have similar interests, waiting for long periods for urbanization of their land; constructing without a permit on a private land parcel is considered to be the only solution in such areas.

In the post-World War II years in Greece, informal-sector housing had become practically a component of housing supply and an alternative to the lack of affordable housing policy within a free market economy. Through the successful urbanization of informal settlements with a legalization process, and the provision of the necessary infrastructure mostly by a state budget, Greece has avoided big distinctions between poor and rich neighborhoods. The legalization policy that had been followed, when economic, historic and political conditions were much different in Greece, had a positive impact on the environmental, economic and social situation, and it can be considered as an example of good practice.

Germany has developed successful tools and procedures for land development and monitoring. Intergovernmental coordination on standards and e-government procedures are also being improved so that surveying, mapping and cadastral authorities will provide the necessary data to the public and the private sectors at a federal level. Currently, major nation-wide modern spatial planning and land administration projects are under development in Greece, too, aiming to create the necessary tools for efficient spatial data infrastructure and sustainable land management. However, old-fashioned legal tools and practices must also be updated, together with a reform of land-use controls.

5. CONCLUSIONS

Land tools like urban planning, land-use regulations and property registration cannot be applied without careful decision-making, taking into consideration international trends but also cost-effect assessments based on the local specific information. Each country has developed its own tools according to the country's specific legal, social, economic, historic, and cultural conditions and demands. Improved technology has allowed for massive low-cost spatial data

capturing to facilitate land development and monitoring. Legal, technical, administrative and financial tools could lead to the following trends; such as:

- Provision of new residential areas in order to increase the land supply, decrease the costs, and eliminate corruption.
- Careful legalization of informalities, where feasible, to unblock the real estate market and the economy.
- Spatial Data Infrastructures to facilitate land management and information dissemination to both public and private sectors. Interoperability of data, tools and procedures can facilitate e-governance.
- New cadastral surveys in Greece, in areas under urbanization must be suitable for direct adoption within the cadastre's database.
- Legislative reforms concerning land, and land-use controls, with modern environmental, technical and cost-effective economic tools.
- Improvement of supervisory procedures by the local authorities and public administration.
- Owners in areas under urbanization must actively participate and also contribute with both land and money, as "impact fees". Local authorities should subsidize the procedures. To expedite urbanization process in their area, owners must undertake a major share of the real costs for the necessary land improvements and infrastructure provision.

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