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SUSTAINABLE URBAN PLANNING THROUGH AN ECONOMIC AND FINANCIAL LENS

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This paper summarizes the assumptions, methods, findings, and conclusions of a study conducted in support of Portugal's ongoing revision of the Land, Territorial Planning, and Urbanism Act. It emphasizes that municipalities need economically and financially sustainable urban development operations, since planning decisions often increase land values and create surplus gains that should serve the public interest. The study reviews how fiscal land policies strongly shape markets and land use, and proposes a new municipal instrument to capture part of these unearned increments: a 20% levy on the land-value increase generated by plan-assigned building capacity (m²) in specific interventions. A case study from Lagoa (Algarve), within the Urban Development Plan of Planning Unit 11, applies the method by calculating buildable capacity, surplus values, and the corresponding fee to be charged to developers. The proposed mechanism strengthens municipal finances, improves transparency in the sources and uses of public funds, and helps redirect planning-generated gains toward social purposes, with potential for replication across municipalities.

Index Terms — Economic and financial sustainability of urban development, Urban development plans, Land surplus values, Land taxation

BACKGROUND AND POLICY CONTEXT

Portugal is currently reforming its legal framework for land policy, territorial planning, and urban development. At the center of this reform is the Portuguese Land, Territorial Planning and Urbanism Act (Lei n° 31/2014), which is being articulated with revisions to the legal regime governing Territorial Management Instruments, the regime of Urbanization and Building, and the new Cadastral Law. Together, these measures seek to correct limitations and inconsistencies of the former framework while also supporting a broader restructuring of the State's role in these domains. The previous legal system was frequently difficult to operationalize and sometimes internally inconsistent, largely because multiple complex plans could overlap on the same area (reducing clarity about which rules applied), municipalities often relied on individualized territorial plans and urban-development models (hindering coordinated and sustainable planning), and the dominant planning approach encouraged spatial expansion, proving ineffective at containing rapid growth of speculative land supply. [1]

A key innovation in the new paradigm is the requirement that urban plans and programs incorporate an economic and financial sustainability model. In practical terms, this introduces a viability condition: plans should only receive approval when they can generate revenues that are at least sufficient to cover the costs they impose.

Fiscal Land Policies

Choices made in defining and implementing planning, together with imperfections in land markets, can produce socially undesirable land uses and patterns of urban growth. For this reason, planning authorities must intervene to correct these distortions, particularly through land-policy instruments. Such policies may take the form of direct regulation of urban development, fiscal mechanisms that shape development, or broader measures that indirectly steer urban change. [2] Among these, fiscal instruments—which influence general or specific development outcomes via taxation—tend to exert the strongest effects on land markets and land-use decisions, and they can materially affect whether planning objectives are achieved. Their performance can be evaluated through their impacts on development patterns and on the financing of urban-planning actions. [3]

In general, land taxation pursues several interrelated aims: securing revenues for public administration; redistributing wealth to support the social function of land by improving equity and reducing inequality; recapturing for society the incremental land values generated by planning decisions and public investments; and encouraging the availability of land for urban development. [3]

For taxation tools to operate effectively, however, they must rely on transparent and objective reference parameters that are shared by owners and valuation professionals. A robust valuation basis is essential to ensure equal treatment and to channel windfall gains created by planning choices or public spending toward the broader public interest.

Within this context, the present work proposes and details a technical study for a new fiscal land-policy instrument that aligns with the economic and financial model now required for urban plans and programs under the new legal framework. The core idea is that a portion of the surplus values generated by planning decisions—specifically, those arising from the assignment of concrete building capacities (derived from parameters defined in the Municipal Master Plan, Urban Development Plans, Detail Plans, parcelling-out procedures, or other territorial management instruments)— should be recovered for public purposes.

Once operational, the instrument is expected to strengthen municipal economic and financial sustainability by: (i) clarifying the sources and uses of funds associated with urban development processes; (ii) enabling a clear, objective valuation and fair collection of planning-induced land surplus values; and (iii) improving the

balance of how development costs and benefits are distributed among residents within a municipality, ensuring that gains from urban operations are explicitly measured and allocated in accordance with the general social interest.

Overall, the intended outcome is a moderation of maximum land values and a constraint on speculative dynamics, without creating a broad-based tax burden on most households or increasing construction costs. [4, 5] In this way, the redistribution of urban-development costs and benefits between public authorities and private actors becomes more transparent, supporting fairness within each municipality. [4]

METHODOLOGY

The proposed approach follows these steps:

1. Assess the specific building capacity (m^2) allocated to distinct planning and management operational sub-units and their respective uses within the urban intervention area, based on the applicable ordering plans.
2. Estimate the average costs per square meter associated with urban infrastructure execution, maintenance, and reinforcement, as well as average construction costs (m^2), and the corresponding municipal land value per square meter based on market transactions.
3. Compute the municipal land value (m^2) in accordance with the Real Estate Municipal Tax Code.
4. Calculate surplus value per square meter as the difference between the market-based land value and the tax-code-based land value.
5. Value the allocated building capacities by applying the computed land surplus value (m^2) for buildable land assigned to urban uses.
6. Estimate the potential revenue collectable under the proposed instrument by applying a 20% fee to the value computed in the previous step.
7. Present conclusions and additional reflections.

The concrete average building capacity (m^2) is defined as the gross built surface area (in m^2) permitted by the applicable territorial planning instruments per unit area of land (m^2) within a given execution unit, intervention area, or urban-development operation. It is computed as the quotient between the total land areas to which urban parameters from different planning instruments apply[1] (organized by use type), multiplied by the relevant occupation and land-use indices[2], and weighted by the share assigned to each use relative to the total buildable intervention surface.

Surplus value per square meter is defined as the difference between (i) the average municipal land price derived from property-market transactions and (ii) the corresponding land price computed under the Real Estate Municipal Tax Code. Total surplus value is obtained by multiplying surplus value per square meter by the corresponding gross built surfaces and summing across all plots within the intervention area and across all expected uses.

[1] For example, Urban Development Plans, Detail Plans, or parcelling-out procedures.

[2] Occupation indices are the ratio of building footprint to land area (expressed in %), while land-use indices are the ratio of total gross built area to land area (expressed in m^2/m^2).

Finally, the potential collectable amount associated with the proposed territorial management instrument is defined as a 20% fee applied to the total surplus-value-based amount computed above.

CASE STUDY

Overview of the Municipality of Lagoa

Lagoa is a municipality in the Faro district (Algarve), bordered by Portimão to the west, Silves to the northeast, and the Atlantic Ocean to the south (Figure 1). It has approximately 22 791 residents and covers about 88.3 km^2. Administratively, it comprises the parishes of Estômbar, Ferragudo, Lagoa, Porches, Carvoeiro, and Parchal.

Figure 1: Municipality of Lagoa (Algarve).

From an economic-structure perspective, Lagoa is strongly service-oriented. Employment is dominated by the tertiary sector (84.8%), while the secondary sector accounts for 14.0% and the primary sector for only 1.2%. Notably, the weight of services in Lagoa exceeds the corresponding shares for the Algarve region (82.5%) and mainland Portugal (65.3%). [6]

A relatively extensive set of territorial planning instruments is in force in Lagoa. These include the Municipal Master Plan (RCM n° 29/94; Aviso n° 26197/2008; Aviso n° 3872/2012), multiple Urban Development Plans covering distinct Planning Units (including UP 1, UP 11, and UP 12), the seashore Ordering Plan of Burgau–Vilamoura (RCM n° 33/99), the regional territorial plan PROT–Algarve (RCM n° 102/2007; RCM n° 188/2007), hydrological basin planning instruments (DR 12/2002; RCM n° 16-E/2013), the Algarve forest ordering framework (DR n° 17/2006 and its partial suspension via Portaria n° 78/2013), and the Natura 2000 network (RCM n° 115-A/2008), among others.

Municipal Master Plan of Lagoa

The Municipal Master Plan of Lagoa (RCM n° 29/94), applicable to the full municipal territory, defines as principal objectives: (i) implementing territorial-ordering policies that support socially and economically balanced development; (ii) establishing principles and rules for land occupation and land-use change aimed at rational spatial use; and (iii) promoting prudent resource management that protects natural and cultural heritage while improving quality-of-life standards for residents.

Existing built-up urban areas correspond to the urbanized and developable zones identified in the plan, including Lagoa, Estômbar, Porches, Aldeia de Luís Francisco, Ferragudo, Corgos, Bela Vista, Parchal, Mexilhoeira da Carregação, Pateiro, Calvário, Carvoeiro, Poço Partido, Sobral, and Torrinha. Areas considered eligible for land-use change are delineated within specific planning and management operational units (UP 1, UP 2, UP 3, UP 4, UP 8, and UP 9).

Where parcelling-out operations occur in developable zones intended for public equipment and facilities and aimed at urban expansion, the plan requires that these operations be preceded by Urban Development Plans or Detail Plans.

Touristic occupation areas include both (i) land effectively occupied by approved touristic undertakings or comparable buildings and (ii) interstitial land that, subject to suitability, may be allocated to tourism-oriented construction and activities. In this framework, the relevant planning units include UP 7, UP 10, and UP 13.

Touristic Capacity Areas (AAT) incorporate Touristic Development Nuclei (NDT) located and delineated within UP 5, UP 6, UP 11, and UP 12. Until the approval of the corresponding NDT, these areas are treated as non-developable and are subject to the land-use, occupation, and transformation regime established in the ordering and conditioning plans and in the Municipal Master Plan regulation. The NDT are limited to occupying up to 25% of the Touristic Capacity Areas.

The plan further specifies rules for implementing Touristic Development Nuclei, including: exclusion of park or natural-reserve land; a requirement for high-quality, tourism-relevant projects complemented by leisure facilities; exclusive tourism-oriented use; incompatibility constraints for environmental areas; developer responsibility for internal infrastructure and municipal connections, including participation in general-system costs; allowance for one or more undertakings per nucleus provided they are interconnected by infrastructure networks; and the possibility of development across one plot or multiple plots within the same Touristic Capacity Area.

Urban Development Plan for Planning Unit 11

The Urban Development Plan for Planning Unit 11 (UP 11) (Aviso n° 44845/2008) applies to the intervention area defined in the Municipal Master Plan as a Touristic Capacity Area that may host one or more Touristic Development Nuclei. The intervention zone covers roughly 401.6 ha and is located along the coastline segment between Marinha beach and Cabo Carvoeiro, spanning the parishes of Lagoa and Carvoeiro.

At a general level, the plan establishes the regime of land occupation, use, and transformation within the intervention area, including the associated building regime and the regulatory framework for urban-operation projects (such as parcelling-out procedures, touristic undertakings, infrastructures, buildings, and external-space works).

More specifically, the plan is designed to operationalize the Touristic Capacity Area of UP 11 and delineates two Touristic Development Nuclei: an East NDT and a West NDT, both required to respect the ecological structure and the area's natural, cultural, and landscape values.

Land within UP 11 is classified into urban land and rural land. Urban land includes (i) developed land and (ii) land for which urban development may be programmed. Developed urban land comprises urban and touristic-urban zones outside the NDT, such as the consolidated urban area of Benagil; the touristic-urban area north of Carvalho beach (Clube Atlântico); and two touristic-urban areas near Alfanzina. Where developed land is subject to parcelling-out operations, the building regime follows the regulations established in the corresponding building licences.

Land where development may be programmed corresponds to new touristic areas located entirely within either the East or West NDT. In this category, the total developable surface must not exceed 30% of the total surface of the two NDT. The East nucleus is organized into sub-units N1 and N2, while the West nucleus is organized into sub-units P1 and P2.

All undertakings within the programmable development land of each nucleus must meet a four-star or higher

classification. Across both nuclei, the maximum number of beds allocated to touristic uses is 1 720, distributed as a maximum of 1 279 beds in the East NDT and 441 beds in the West NDT.

Regarding building capacity, within areas covered by the Burgau–Vilamoura seashore ordering plan (RCM n° 33/99), only hotel buildings and/or complementary touristic facilities are permitted, except in the East NDT zones designated *"nonaedificandi"*, where construction is prohibited. More generally, the building regime in programmable land within the NDT is governed by the provisions applicable to the respective operational sub-units and by the classifications allowed for touristic undertakings.

To implement UP 11, two execution units are established—East NDT and West NDT—reflecting distinct occupation patterns and environmental conditions and the need for tailored planning and management solutions oriented to either preservation or transformation. The combined surface allocated to the two nuclei (997 737 m^2) must not exceed 25% of the total UP 11 surface defined in the Municipal Master Plan (4 016 158 m^2). In absolute terms, the East NDT covers 741 890 m^2 and the West NDT covers 255 847 m^2.

Estimating a 20% Fee on Surplus Values in Planning Unit 11

To estimate the annual gross built surface in Lagoa, the analysis first compiles statistics on the total number of completed buildings over a four-year period, including new construction as well as enlargements, functional changes, or reconstructions. [6, 7, 8, 9] The total gross built surface (m^2) associated with developed and developable urban land is then estimated as the product of (i) the total number of completed buildings and (ii) the average liveable surface per residential building (Table 1).

The average gross built surface is obtained by multiplying: the mean number of storeys per building, the mean number of dwellings per storey, the mean number of compartments per dwelling, and the mean liveable surface per compartment. The resulting total average liveable surface is finally converted to gross surface by dividing by 0.65, reflecting the assumption that, on average, liveable surface accounts for about 65% of gross built area.

Table 1: Components used to compute the average liveable surface per housing building.

Component	Description
(2) Average number of storeys per building	Mean storeys in completed residential buildings
(3) Average number of dwellings per storey	Mean dwellings on each storey
(4) Average number of compartments per dwelling	Mean rooms/compartments per dwelling
(5) Average liveable surface per compartment (m^2)	Mean liveable area per compartment
Derived: Average liveable surface per building (m^2)	$(2)\times(3)\times(4)\times(5)$
Derived: Average gross built surface per building (m^2)	Liveable surface$/0.65$

The municipal average annual costs with infrastructures' execution, maintenance and reinforcement amounted to 705,2 €/m^2 (Table 2). They were computed according to the values listed in the municipal amortization and provision maps for 2009, 2010, 2011 and 2012 concerning assets within the public domain – other construction and urban infrastructure –, that amounted to an average annual value of 34 044 069 € [10].

The average municipal transaction value/m^2 (€/m^2) in Lagoa Municipality (3) is determined (for each year under analysis) through the quotient between the annual value of the land property transactions (1) [6, 7, 8, 9] and the total gross built surface (2) (Table 3). The price of buildable land per m^2 according to market trade (6) is computed through the difference between the previous value (3) and the average construction costs/m^2 (4) and the average costs/m^2 with urban infrastructures' execution, maintenance and reinforcement (5).

The price of buildable land/m^2 based on town property trade for each planning and management sub-

Table 2: Average investment/m^2 in urban infrastructures' execution, maintenance and reinforcement in the municipality of Lagoa

Investments in urban infrastructures' execution, maintenance and reinforcement	2009	2010	2011	2012
Annual amortization of urban infrastructure (€)	26.399.063	31.439.028	36.570.644	41.767.542
Annual average investment (€)		34.044.069		
Annual average gross built surface (m^2)		48.278		
Infrastructure's cost (€/m^2)		705,2		

Table 3: Price of buildable land/m^2 in the municipality of Lagoa, in 2008, 2009, 2010 and 2011.

	2008	2009	2010	2011
Total value of town property trade (€) (1)	101.687.923	92.541.438	93.778.000	103.169.000
Gross built surface (m^2) (2)	82.539,8	64.916,9	32.087,0	13.568,8
Transaction value/m^2 (€/m^2) (3)=(1)/(2)	1.232,0	1.425,5	2.922,6	7.603,4
Construction costs/m^2 (4)		482,4		
Urban infrastructure costs/m^2 (5)		705,2		
Price of buildable land/m^2 of construction (€/m^2) (6)=(3)-(4)-(5)	44,4	237,9	1.735,0	6.415,8

operational unit and for each type of use within the Planning Unit 11 was assessed considering that respective contribution for the average municipal land price is proportional to the licensed gross built surface for profitable uses. The gross built surface assigned to profitable uses (m^2) was first pointed out in each of the areas that constitute the municipality Lagoa (where different planning instruments are enforced and, among these, different urban indexes are applicable). Next, the product between the price of buildable land/m^2 and the net land use index/m^2 of land was reckoned. The share of the land price/m^2 ascribable to each of the studied areas each year results from the product of the previous value by the percentage that the gross built surface of each identified area represents in relation to the maximum gross built surface licensed in the urban developed and developable municipal areas. These partial totals are, then, summed for the whole studied areas for each year, leading to an average annual land value/m^2 based on town property market trade of 721,9 euros/m^2.

The parameters settled in the Real Estate Municipal Tax Code where, next, applied to each of the considered areas within the municipality of Lagoa. The average annual value of 56,1 euros/m^2 was found out based on corresponding values for 2008, 2009, 2010 and 2011.

The surplus values ascribable to each planning and management operational sub-unit and to each kind of land profitable touristic use was computed through the product between the homologous construction surface and the difference between the annual land price/m^2 based on market trade (721,9 €/m^2) and the corresponding price based on the application of the Real Estate Municipal Tax Code to Lagoa municipality (56,1 €/m^2) (Table 4). For the intervention area of this Development Plan, the proposed 20% fee aimed at social purposes' assignment – according to the methodology herein presented – amounts to 12 764 718 €.

Table 4: Average surplus values and corresponding 20% fee on these surplus values for all the planning and management operational sub-units and respective profitable touristic uses in the Planning Unit 11 of Lagoa.

Touristic undertakings	Land surface (m^2)	Gross built surface (m^2) (1)	Surplus values (€) (2)=(1)×665,8	20% of surplus values (€) (3)=0,2×(2)
Planning and management operational sub-unit East NDT				
N.1 Lodging establishments (Hotels)	30.000	15.000	9.987.000	1.997.400
N.2 Lodging establishments (Hotels, Serviced Flats ou Inns)	191.050	56.210	37.424.618	7.484.924
Lodging complementary means (Holiday Villages)				
Total (East NDT)	221.050	71.210	47.411.618	9.482.324
Planning and management operational sub-unit West NDT				
P.1 Lodging establishments (Hotels)	10.000	5.000	3.329.000	665.800
P.2 Lodging establishments (Hotels, Serviced Flats ou Inns)	66.754	19.650	13.082.970	2.616.594
Lodging complementary means (Holiday Villages)				
Total (West NDT)	76.754	24.650	16.411.970	3.282.394
Total values in the Planning Unit 11 (UP 11)	297.804	95.860	63.823.588	12.764.718

CONCLUSION

This paper motivates, on economic and financial grounds, a new territorial-management mechanism and applies it to the Urban Development Plan of Planning Unit 11 in Lagoa (Portugal). The proposed mechanism consists of charging a 20% levy on the land surplus values generated by plans and plan-based decision making. [11]

By objectively estimating the surplus values produced through urban operations and municipal planning choices, the instrument aims to strengthen local public revenues and, consequently, improve municipal economic and financial sustainability. At the same time, it enhances transparency by clarifying how urban-development funds originate and how they are used, while steering the recovered gains toward the broader public interest rather than narrow, private beneficiaries. Ultimately, the approach is designed to promote fairness across the municipality in the way urban-development costs and benefits are shared among residents.

Although illustrated through the Lagoa case, the instrument is conceived as broadly transferable. Because it relies on standardized data inputs and replicable analytical steps, it can be extended to other municipalities and to other intervention areas governed by Municipal Master Plans, Urban Development Plans, or Detail Plans, enabling consistent comparisons across territories.

In conclusion, within the objectives of the evolving planning and territorial-management framework—particularly those related to economic and financial viability, equity, and social cohesion—the proposed instrument can provide meaningful support to urban development policies and contribute to improving the quality of life of local communities.

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