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Local Equalization and Wide Areas Land Planning in Syracuse

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Abstract

The implementation process of the Syracuse's Master Plan is characterized by the widespread use of "urban negotiation". The Municipality has drawn up a protocol aimed at obtaining areas for facilities and public infrastructure in different areas basing on the rule of the transfer of a portion of land in return for the building permission for the remaining part. Since these areas are variously characterized, the negotiation process may not be fair to Municipality or convenient to land owners. Basing on an equalization pattern, this study provides, for each area, the indexes of fairness and convenience, and, more specifically, the difference between the market value of the areas achieved and the value of the permits issued. and based on the possibility to transfer the development rights, some different scenarios are prefigured about the possibility of acquiring additional areas for social housing and/or achieving funds for sustainable buildings.

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1. Introduction

The Master Plan of Syracuse, approved in 2007 (GURS 46, 2007), aims at satisfying the needs of the settled people, also taking into account the demographic projection. Since the negative migratory balance in the '90s (1,500 inhabitants from other municipalities, over 2000 canceled) overcomes the natural positive one (1,100-1,200 births vs 900-950 deaths), the global demographic balance is negative, mostly due to both the fluxes of non-EU migrants, and the affordability of the hinterland areas dwellings. Nonetheless, at the end of the Master Plan recording period (2001,

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last National Statistics Institute survey) the number of registered families (47,171) had grown (+1,600) due to the reduction in the number of components (from 2,76 to 2,66). Three demographic scenarios and the consequent housing needs have been carried out by considering three different data periods, as summarized in table 1:

Table 1. Master Plan Housing needs envisage (Source: Municipality of Syracuse, <http://www.gurs.regione.sicilia.it/Gazzette/g07-46o/g07-46o-p2.html>).

Scenarios	Period	Population trend	Families		Dwells			
			annual increase	by 2013	main dwells	secondary dwells	previous need	total need
A	1990-2000	stable	180	2400	2158	216	788	3162
B	1995-2000	decreasing	90	1200	1192	119	788	2099
C	1990-1995	increasing	235	3137	3116	312	788	4216

The total amount of building to be provided and the total area to be occupied have been calculated for each scenario taking into account the average surface and volume of a dwelling, and the three different typologies: detached/semi-detached house (1-2 dwellings houses), 3-6 dwellings houses, 10-15 dwellings buildings with shops and offices, basing on two estimates, as displayed in table 2:

Table 2. Master Plan: housing needs envisage (Source: ib.).

Scenarios	Hypotheses	Dwellings	1-2 dwellings houses			3-6 dwellings houses			10-15 dwellings houses		
			%	surface	cubage	%	surface	cubage	%	surface	cubage
A	1	3162	50%	221.326	649.868	30%	132.796	389.921	20%	88.530	265.591
	2		40%	177.061	519.894	30%	132.796	389.921	30%	132.796	398.387
B	1	2099	50%	146.944	431.464	30%	88.166	258.878	20%	58.778	176.333
	2		40%	117.555	345.171	30%	88.166	258.878	30%	88.166	264.499
C	1	4216	50%	295.092	866.463	30%	177.055	519.878	20%	118.037	354.110
	2		40%	236.074	693.170	30%	177.055	519.878	30%	177.055	531.166

Table 3 provides the range for total cubage the quota of social housing, and occupied land:

Table 3. Master Plan Housing needs envisage (Source: ib.).

Scenarios	Dwellings		Shops and offices		Social housing		Total amounts		
	surface	cubage	surface	cubage	n. dwellings (from)	n. dwellings (to)	surface	cubage	occupied land
A	442.652	1.327.956	124.015	372.044	1.200	2.200	566.667	1.700.000	1.292.500
B	293.888	881.664	92.779	278.336	840	1.500	386.667	1.160.000	820.000
C	590.184	1.770.552	169.816	509.448	1.600	2.900	760.000	2.280.000	1.800.000

The Master Plan supposes 2.2 million m³ of housing cubage to be implemented within the dense urban area and in the residual areas in which the previous bonds decayed. Social housing and mixed use development operations are supposed to be implemented with recourse to the equalization (Cheshire & Nathan & Overman, 2014). The process develops by: identifying the different intervention areas for developments; concentrating the new buildings taking into account the urban quality of the different areas to be transferred to the municipality for primary and secondary developments in exchange for building permissions; diversifying the cubage rate; dividing the areas to be developed in sectors and sub-sectors. The areas to be developed are: the “Borgata di Santa Lucia” (150,000 m³); the new urban area (1,817,500 m³); the building programs areas (560,000 m³); the hamlet of Cassibile (143,000 m³). The secondary developments’ needs (S1 – Education; S2 – Public facilities; S3 – Green areas; S4 – Parking) are m² 940,125 in

urban area and Borgata, m² 645,777 in the southern water front and m² 77,234 in Cassibile; the total amount is m² 1,663,136.

2. Valuation, equalization and implementation: general principles and the method

The proposed valuation process aims at investigating the effectiveness – convenience for owners, fairness for public – of the equalization process as supposed for each sector. A specific application of the “transformation value” (extraction method) has been carried out starting from the basic formula (1) where the extraordinary permission fees are expressed; the normal profit can be assumed as a quota of the total investment (2) and the normal global profit rate as the sum of the weighed average cost of the capital paid in advance and the premium for risk and organization (3), so that the permission fees can be easily calculated (4); furthermore, as required by the equalization process, for each sector the appropriate cubage rate is calculated (Giuffrida and Gagliano, 2014) (5).

$$v_t = v_f - k - f^* - \pi \quad (1)$$

$$\pi = r(v_t + c + f^*) \quad (2)$$

$$r = [(w + r')(1 + w + r')^n - 1]/(w + r') \quad (3)$$

$$f^* = \{v_f - [(v_t + k)(1 + r)]\}/(1 + r) \quad (4)$$

$$i_f = [v_t \bar{h}(1 + r)]/s_f [\bar{p} - \bar{k}(1 + r)] \quad (5)$$

Nomenclature

v_t	current real estate value of the total private developable area comprised in the sector
v_f	value of the private property at the end of the development process
k	building cost including ordinary permission fees
r	global profit rate along each loan term
w	weighed average cost of capital
r'	annual profit rate for the promoter's risk and organization
f^*	extraordinary permission fees
n	loan term (years)
i_f	cubage ratio
\bar{h}	weighed average height of the buildings included in the sector
s_f	permitted area
\bar{p}	weighed average market price of the buildings included in the sector
\bar{k}	weighed average unit building cost of the buildings included in the sector

The proposed model actualizes an “axiological approach” through the well known “equalization of values” that aims at integrating, and someway overcoming, the pattern supposed by the Municipality, that actualizes an “object/performances approach” through the more usual “equalization of objects” based on urban qualities and building quantities (cubage rates) within each sector (Cadell & Falk & King, 2010).

Moreover, an equalization of values pattern: since it deals with substitutable values, it is able to capture also environmental, landscape and social values; since it represents the urban objects as values, it allows planners and decision makers to implement equalization processes regardless of the actual fragmentation of properties, thus making planning more flexible and consistent with the general land-social issues (Atkinson & Stiglitz, 2015; Dempsey, & Bramley & Power & Brown, 2011).

Due to the different urban-environmental characteristics of the examined sectors, the comparison between revenues and costs may result unfair whatever the area transferred to the municipality (Trovato & Giuffrida, 2014). In some cases, these inequalities need to be compensated by increasing the cubage rates. In these cases some sectors could be grouped in over-sectors within which the development rights can be balanced without distorting the urban landscape. In the proposed pattern, because the convenience for owners (normal profit rate) is a constraint that can be negotiated at the beginning: a) given the land market value, the larger the transferred area, the higher the cubage ratio; b) given the transferred area, the higher the land market value, the higher the cubage ratio; as a consequence, c) given the transferred area and the land market value, a fairness ratio can be calculated for each sector by comparing the amount of the permit fees and the value of the transferred area.

Moreover, if a part of the development operations is supposed to be funded by private profit surplus (extra-normal profit), the extra-ordinary permit fees should increase by arising the cubage ratio. Then, given the transferred area, the self-financial ratio (fairness) is calculated and, vice versa, by setting a minimum self-financing ratio, the area to be transferred is calculated. If self financing ratio is zero, the value of the transferred area should be at least equal to the value of the extraordinary permits fees. As a result, the proposed pattern allows municipality to actualize a “polar equalization by values” aiming at balancing the different convenience profile for each sector.

3. Application and results

The investigation we carried out handles a sample of 150 sectors – included in A and B areas as delimited by the Master Plan – taking into account: the existing functions and their opportunity-costs; the supposed uses (dwellings, offices, shops etc.) and their costs and real estate expected prices; the secondary development operations and their costs and any revenue if a private/public management is supposed; the database is sampled in Fig. 1.

sector id	private area	1. housing	2. accommodations	3. tertiary	4. shops-offices	5. shops	1. housing	2. accommodations	3. tertiary	4. shops-offices	5. shops	6. education	7. community facilities	8. parks-sport facilities	9. parkings	10. local streets	11. public park	12. main streets	13 other facilities	transferred area	max height	max covered area	permeability
30	5075	100					5075					4943			977	2531				8451	16,8	0,25	0,10
31	2974	100					2974					3089			296	1567				4952	16,8	0,25	0,10
32	9698	100					9698					14808				1286				16094	16,8	0,25	0,10
33	2022	100					2022						3381							3381	16,8	0,35	0,10
34	1065	100					1065							1763						1763	16,8	0,35	0,10
35	5875	100					5875					3290	2292		738	3921				10241	16,8	0,25	0,10
36	442	100					442														16,8	0,25	0,10
37	63000		100					63000					9950	15944	26076	2343	70941	30478		155732	19	0,25	
38	781	100					781							1300						1300	16,8	0,25	0,10
39	25043		40		60			10017		15026					10373	2578			39158	52109	13,5	0,25	0,10
40	5612	100					5612														10,6	0,25	0,10
41	1494	100					1494														10,6	0,35	0,10
42	607	100					607														7	0,35	0,10
43	1173	100					1173					3675			605	198				4478	7	0,35	0,10
44	251	100					251								907	210				1117	7	0,35	0,10
45	9058	100					9058					15082								15082	16,8	0,25	0,10
46	2066	100					2066						2357		739	344				3440	16,8	0,35	0,10
47	1956	100					1956					2299			958					3257	16,8	0,35	0,10
48	1858	100					1858							2166	927					3093	16,8	0,35	0,10
49	1531	100					1531								2264	288				2552	16,8	0,35	0,10
50	3982	100					3982					5933				703				6636	16,8	0,35	0,10
51	13341	30			70		4002			9339		4713	5325		936	3835				14809	16,8	0,25	0,10
52	4087	30			70		1226			2861			4130		407					4537	16,8	0,35	0,10
53	20319	30			70		6096			14223		15600			2740	4215				22555	16,8	0,25	0,10
54	2998		100					2998				9492				2989				12481	7,5	0,25	0,10
55	2683		100					2683				5117				6051				11168	7,5	0,25	0,10

Fig. 1. Sample of the general database

Each different mix of the time/financial variables (loan term, that is the economic cycle duration, interest rate, opportunity cost of equity, leverage, profit rate), corresponding to a different yield/risk profile, provides a different economic-financial layouts, as sampled in Fig. 2, showing with the blue/red bars the sectors (rows) in surplus/deficit

from the two points of view of internal balance (extraordinary permit fees) and of the external balance (self financing ratio).

sector id	promoter (thousand euros)										municipality (thousand euros)						
	current land value	building cost	technical expenses	costs			promoter normal profit	revenues			costs			revenues			
				taxes	ordinary permit fees	extraord permit fees		real estate market value	building cost	technical expenses	taxes	ordinary permit fees	extraord permit fees	management	self-finance ratio		
30	180	13145	1114	3137	7	679	972	10696	474	33	104	7	-7679	21	100%		
31	106	7940	669	1894	4	809	570	6268	264	18	58	4	-4809	6	100%		
32	344	31725	2591	7550	13	298	1858	20439	193	14	42	13	-23298	0	100%		
33	72	3907	383	944	4	186	542	5966	6413	449	1411	4	186	0	2%		
34	38	2057	202	497	2	98	286	3142	235	16	52	2	98	48	49%		
35	215	12227	1080	2927	8	985	1126	12382	3765	264	828	8	-4985	16	100%		
36	6	605	60	146	1	36	85	932	0	0	0	1	36	0	0		
37	2916	79866	7695	19264	428	111	12436	136800	28193	1973	6202	428	17111	999	51%		
38	28	1086	106	262	1	42	150	1646	173	12	38	1	42	35	35%		
39	1029	28840	2781	6957	189	100	4965	54611	37937	2656	8346	189	10880	225	23%		
40	75	4871	480	1177	5	251	678	7463	0	0	0	5	251	0	0		
41	20	1808	179	437	2	103	253	2781	0	0	0	2	103	0	0		
42	8	488	48	118	0	24	68	746	0	0	0	0	24	0	0		
43	75	3644	278	863	1	474	131	1442	88	6	19	1	-3474	13	100%		
44	18	217	20	52	0	-8	28	309	119	8	26	0	-8	20	8%		
45	322	31174	2528	7414	12	774	1735	19090	0	0	0	12	-23774	0	0		
46	73	3991	392	964	4	190	554	6096	4594	322	1011	4	190	16	4%		
47	70	7744	649	1846	4	997	525	5771	93	6	20	4	-4997	21	100%		
48	66	3590	352	867	4	171	498	5482	378	26	83	4	171	79	52%		
49	54	2958	290	715	3	141	411	4517	262	18	58	3	141	49	57%		
50	142	17927	1472	4268	8	993	1068	11749	105	7	23	8	-12993	0	100%		
51	375	24133	2202	5794	128	164	3342	36762	7880	552	1734	128	1164	20	13%		
52	115	7814	770	1888	55	306	1433	15767	7895	553	1737	55	3806	0	38%		
53	572	47133	4080	11267	195	773	5090	55991	897	63	197	195	-11773	59	100%		
54	206	7358	559	1742	5	945	272	2990	448	31	99	5	-6945	0	100%		
55	185	4727	370	1121	5	790	243	2676	908	64	200	5	-3790	0	100%		

Fig. 2. Sample of the results of the valuation process

4. Discussions and conclusions

The results obtained lead to a global assessment of the current land policy by equalization. The equilibrium between private interests and public aims has been pursued in most cases; in just few and large areas both the internal and the external consistencies are widely disregarded basically due to the excessive size of the public works supposed, compared to the private ones. Regarding to the ratio between the extraordinary permit fees and the amount of the promoter’s investment (R1), Fig. 3 shows four distributions of the 150 sectors among the 15 of R1 classes in which narrower (1, from -100% to +100%) or larger (4 – from -200% to +200%) ranges are divided. The same way, regarding to the self-financing ratio (R2) Fig. 4 shows the related distributions of the sampled sectors. In both cases, the larger the range, the farer from 0% the mode of R1 and R2.

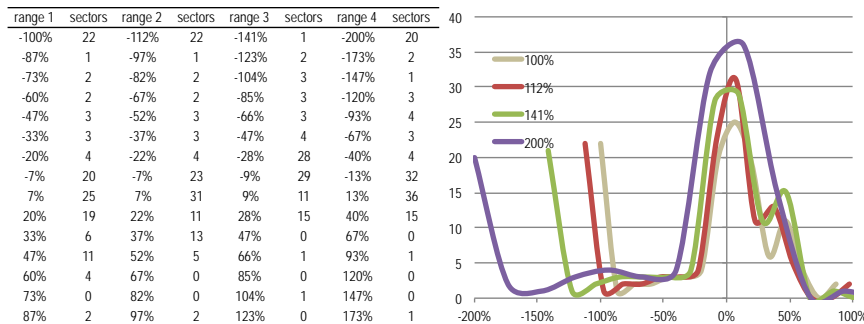


Fig.3. Distributions of the sectors by ratio R1.

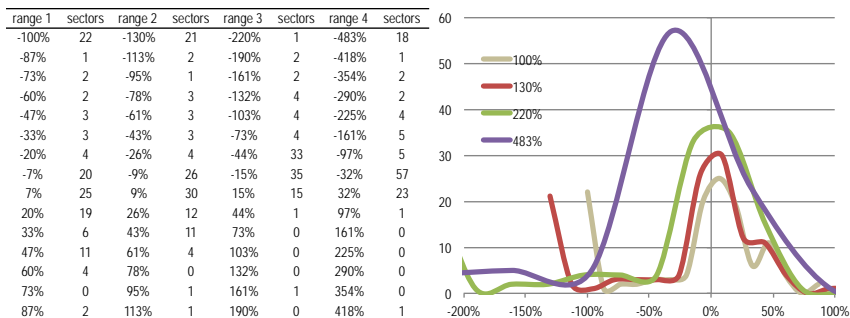


Fig. 4. Distributions of the sectors by self-financing ratio R2.

About the fairness of the plan with regard to the social housing issues, and according to the general perspectives of the Master Plan, the pattern allows us to select the sectors in which a reasonable quota of the supposed residential areas can be devoted to social housing. The sectors are selected if a favorable ratio R2 occurs; once calculated the area to devote to social housing by dividing the extraordinary permit fees by the unit building cost of social housing, a threshold for the minimum area to be admitted to this function is established; the sectors are selected according to the threshold; finally, the total capacity of the whole area for social housing is calculated and a quota of it can be assumed as relevant in order to satisfy the Master Plan needs. Tab. 4 shows these last results.

Table 4. dimensioning social housing capacities

Threshold	Selected sectors	Social housing area	Settled inhabitants
500	9	35,521	395
1000	6	32,968	366
2000	4	30,657	341
4000	3	27,485	305

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