

Housing Production in Urban Egypt: the inert Formal Sector versus the Ungovernable Informal Sector

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Abstract

By focusing on formal and informal housing production both at the national and governorate levels, this paper argues that while formal housing production over the 1982/2013 period is characterized by inert capacity in addition to major deviation from plan leading to acute economic housing shortages, it is not solely the main driver of informal housing production. In other words, overproduction is an intrinsic characteristic of the informal sector; while it has been responsive to acute formal housing shortages in several governorates; it has not been responsive to actual housing needs. The analyses of formal housing at the national level showed that significant economic housing shortages during the 1997/2013 period are partially explained by the inert capacity of the formal sector and the private sector's shift away from economic housing towards middle income housing. During the 1996/2006 and 2006/2013 time periods, formal housing production at the governorate level only achieved targets and small surpluses in a few small and medium size governorates while it contributed to significant housing shortages in the largest governorates in the Greater Cairo Region and Alexandria. The analyses of formal and informal housing production during the 1996/2006 period showed that: there was an overproduction of 1.4 million housing units; production in the informal sector contributed more to housing production than the formal sector; production in the formal sector was uneven and failed to cover housing needs in many governorates; and production in the informal sector was excessive and highly concentrated. The informal sector accounted for almost 74.8 % of total overproduction during the 1996/2006 period, of which 70 % was in the three governorates of Cairo, Alexandria and Qalyoubia.

Key words: informal and formal sectors, housing production, overproduction, household formation, vacancy, closed units, Urban Egypt

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Introduction: Strategic Housing Production Issues

Egypt's commitment to provide shelter for all, recently entrenched in its Constitution, is evident in the inauguration of major national housing programs and the enactment of many institutional and regulatory reforms. However, policy makers are confronted by a number of *strategic housing production issues* that are highly interrelated and need to be addressed systematically at the governorate and sub-governorate level. First, according to the MHUUC/Un-Habitat 2015, formal housing production did not achieve planned targets during all five year plans covering the period from 1982 to 2007 and the 2007/2013 period. Moreover, a total shortage of 2.564 million units was identified over the whole 1982/2013

period, of which 2.413 million were economic housing units¹. Second, the persistent lack of sufficient and affordable formal housing options for the poorer segments of the population is considered by policy makers and academics among the main factors contributing to the continued growth of informal areas and deterioration of slums (Kholie, 1992; Arandal & Batran 1997; Sims 2012, 2015; Shehayeb, 2009; Regina and Fischer, 2009; and Soliman 1996, 2004). According to CAPMAS, total informal population in 2006 was estimated at 11 million accounting for 35 % of total urban population, of which 5 million were in the Greater Cairo Region².

Third, In spite of significant formal sector housing shortages there is a continuous trend of overproduction evident in the increased percent vacant units and a growing trend of withholding units closed due to availability of other residence. During the 1996/2006 period, housing units in residential buildings³ in Urban Egypt increased from 8.357 million units to 12.145 million units, yielding a net change of 3.788 million units while households increased from 5.840 million to 7.737 million HHs yielding a net change of 1.897 million HHs, which clearly indicated that similar to the 1986/1996 period, the informal sector is overproducing and contributing to the growing stock of vacant units.

The problems of vacant and unused units⁴ are well recognized by policy makers and academics and various studies have attempted to examine the contribution of the informal and formal sectors to overproduction and increasing vacancy rates during the 1986/1996 period (NUO/GOPP 2011, 2005; GOPP/Koica 2001; MHUUD 2005; Bakr, 2006a, 2006b); however, the sheer size of vacant and closed units for availability of other residence in residential buildings reported in the 2006 Census, signaled a serious and persistent structural problem of over production in Egypt's urban and rural areas manifested in very high rates of unused units. In 2006 there were 3.523 million unused units in Urban Egypt, including 2.556 million vacant units (21.05 % of total units) and 0.967 million closed units (7.96 % of total units) accounting jointly for 29.01 % of total units. The respective rates for unused units in 1986 and 1996 are 15.47 % and 22.4 %, which clearly indicate a continuous trend of overproduction.

The increase in the percent closed units for availability of other residence from 3.21 % in 1986, to 5.07 % in 1996, to 7.96 % in 2006, signaled an increasing trend of HHs moving to new housing units while withholding their former units from the housing market. In new towns, about 56.64 % of the 0.534 million housing units⁵ were unused in 2006 as a result of very high shares of vacant and closed units (31.22 % and 25.05 %, respectively). While a major policy concern, they are relatively small in numbers (0.167 million, and 0.136 million units, respectively) in comparison to the total number of vacant and closed units in Urban Egypt.

Fourth, CAPMAS tenure data shows that the majority of the vacant housing stock lacks effective demand and a large share of closed units for availability of other residence are owned. Of the 3.428 million vacant housing and non-housing units in residential buildings in 2006, 92.6 % were not tenured, 6.33 % are owned, and 0.51 % were under ordinary rent. Similarly, 94.4 % of vacant units in new towns were not tenured. This means that only a very small portion of the vacant housing stock (0.217 million vacant units) has been absorbed by the market, while the majority lacks effective demand⁶. Moreover, of the 0.996 million closed housing units for availability of other residence in 2006, 21.78 % were under ordinary

rental arrangements and 74.95 % were owned. In new towns, 94.6 % of closed units for availability of other residence were owned. CAMPAS 1996 and 2006 data shows that the number of households living in old law rental units remains quite large especially in the GCR and urban governorates⁷. While there has been an evident decline in the percent HHs living in old law rental units, in 2006 there were 2.275 million HHs still living in old law rental units, compared to 2.574 million in 1996. Clearly, the number of HHs living in old law rental units is declining at a very low annual rate (-1.2 %).⁸

Finally, housing production has contributed to noticeable improvements in households' living conditions at the housing unit level during the 1996/2006 period in Urban Egypt similar to the 1986/1996 period (Bakr, 2006c; GOPP 2005;). The percent HHs living in substandard housing⁹, declined from 32.39 % in 1986 to 16.27 % in 1996 and to 8.06 % in 2006 (MHUUC/UN-Habitat 2015). In fact, there has been an absolute decline in the number of households in substandard housing as 0.536 million HHs and 0.326 million HHs, respectively, moved out of substandard housing to better housing types during the 1986/1996 period and 1996/2006. However, the North/South divide remains large in 2006, as 20.56 % of HHs in Upper Egypt lived in substandard housing compared to 6.15 % in the GCR, 4.97 % in urban governorates, and 5.11 % in Lower Egypt.

The Argument

This paper argues that while formal housing production over the 1982/2013 period is characterized by inert capacity in addition to major deviation from plan leading to acute economic housing shortages, it is not solely the main driver of informal housing production. In other words, excessive overproduction is an intrinsic characteristic of the informal sector; while it has been responsive to acute formal housing shortages in several governorates; it has not been responsive to actual housing needs. Accordingly, it accounted for very high shares of overproduction in many governorates and significantly contributed to the growing stock of vacant units. Housing production is analyzed at the national and governorate/regional levels to demonstrate that inert formal sector capacity and over production in the informal sector represent key strategic policy issues that need to be addressed.

Paper Objectives

By focusing on formal and informal housing production both at the national and governorate levels, this paper attempts to add new understanding to the already well established housing production issues and challenges. The main objectives of the analyses of formal and informal production at the governorate level are three fold. First, formal production during the 1996/2006 and 2006/2013, which have been identified as periods of acute housing shortages, are examined at the governorate level to identify variations with respect to achievement rates, hence the extent of shortages and/or surpluses during both periods and whether or not there are governorate and/or regional variations. Second, governorate variations with respect to percent unused units (both vacant and closed for availability of other residence) are examined to identify the extent of over production during the 1996/2006 period. Finally, the contributions of both the formal and informal sectors to actual housing production and household formation during the 1996/2006 period are estimated; hence, their respective contribution to overproduction at the governorate level is identified.

Methodology

This paper is based on the quantitative analyses of secondary data made available from the Census of Population, Buildings and Units, and Households' Living Conditions in 1986, 1996, 2006; and housing production data provided by the Housing Sector/Ministry of Housing, Utilities and Urban Development. Data sources for informal population include CAPMAS, Ministry of Local Development and ISDF, and the governorates for informal areas in Alexandria and Port Said.

National Housing production data covering all five year plans over the July 1982/July 2007 and the July 2007/July 2013 period Was divided into four time intervals: the 1982/1987, 1997/2007, and 2007/2013; mainly to be comparable with census data. Housing production indicators by housing level and sector include: total and annual number of planned¹⁰ and produced units, achievement rates, shortages and/or surpluses, and the contribution of each sector to housing shortage/surpluses.

Upon review of *Governorate formal housing production* data covering the July 1996/2006 and July 2006/31st December 2013, time periods, the Study Area was defined to include all governorates in the Nile Valley and Delta as frontier governorates were excluded due to their distinct nature¹¹. Governorate housing production indicators include: total and annual number of planned¹² and produced units, achievement rates, and surpluses and shortages during the different time periods.

Overproduction at the governorate level during the 1996/2006 period is identified by several indicators namely: housing production rate (annual increase in new units over the 1996/2006 period per 1000 population in 1996), household formation rate (annual increase in new HHs between 1996/2006 per 1000 population in 1996), percent vacant units, percent closed units, and percent unused units in 1996 and 2006 (Vinay ed. 1996, Vinay 2005; Page & Seyfried et al, 1970).

Actual housing production at the governorate level during the 1996/2006 period is defined as the net change in housing units in addition to the absolute decline in the number of units comprised of whole houses and single rooms, facilitated by the replacement of rural houses with apartment buildings, houses, and villas. While some rehabilitation units are not accounted for in the Census Data, they are relatively small compared to actual production. Accordingly, the respective contribution of the formal and informal sectors to actual housing production is identified.

Actual change in households at the governorate level during the 1996/2006 period is defined as the net change in formal and informal households during the 1996/2006 period in addition to the number of households that moved out of substandard housing. To estimate net change in households into formal and informal households, population and HHs in informal areas at the governorate were estimated. Moreover, the absolute decline in the number of HHs moving out of substandard units was proportionately added to the net change in formal and informal HHs and the respective contribution of both sectors to actual household change is defined.

Over production Rate is defined as the difference between actual change in housing units and actual change in households by the actual change in Households. To identify the

respective contribution of the formal and informal sectors to overproduction, two sets of achievement rates were calculated at the governorate level, respectively. The first is the sector's achievement rate to total change in HHs; the second is the sector's achievement rate to the sector's change in households. In other words, the first achievement rate measures the sector's response to total housing needs, and the second measures its response to the sector's specific housing needs. Accordingly, the contribution of each sector to production shortages/surpluses were identified based on the assumption that units produced beyond each sector's share of HHs is a surplus not absorbed by the market and contributed to increased vacancy rate, and vice versa, any units produced below its share of HHs is a shortage.

Formal Housing Production versus Plans at the National Levels: 1982/2013

The analyses of formal housing production at the national level during the 1982/2013 period attempts to answer the following questions: i) what is the extent of formal sector housing shortages/surpluses by housing level?; ii) what is the contribution of the public and private sectors to economic housing shortages during the different time periods?; iii) did formal housing production respond to new households' needs?; and what explains economic housing shortages?

What is the extent of formal sector housing shortages/surpluses by housing level during the 1982/2013 period?

Over the whole 1982/2013 period, there was a total shortage of -2.564 million units of which only 0.317 million were middle income housing units yielding a relatively small annual shortage of -10217 middle income housing units. As evident in Table 1 and Figure 1, middle income housing shortages are evident during all time intervals except for a small surplus during the 2007/2013 period. Moreover, there was a surplus of 0.166 million upper-middle & high income housing units (UM&High) over the whole 1982/2013 period which amounts to small annual surplus of +5351 units. UM&High income housing surpluses are observed during all time periods except for a small shortage during the 1987/1997 period. In contrast, there was a very large shortage of 2.413 million economic (low cost) housing units over the whole 1982/2013 period, yielding an annual shortage of -77,838 units. Except for a relatively smaller annual shortage during the 1982/1987 (-30,133 units), very high almost equal economic housing shortages are observed during 1987/1997, 1997/2007 and 2007/2013 time periods (- 82,118 units, -87,331 units, and -91,716 units, respectively). Clearly, middle income housing shortages are not significant in comparison to economic housing shortages.

What is the contribution of the public and private sectors to economic housing shortages during the different time periods?

As illustrated in Figures 2 and 3 there were wide variations between the private and public sectors with respect to annual rates of economic housing production and achievement rates, respectively. *The 1982/1987 period*, marks the period with the highest total and economic achievement rates (88.55 %, and 76.8 %, respectively), and the largest number of economic units produced annually (99,474 units), hence the smallest shortage. This is largely due to *unprecedented high total and economic housing production by the private sector* (129,606 units, including 70,316 economic units, respectively). During this period, the private sector

allocated 54.25 % of its production to economic housing units and produced 70.7% of the 0.497 million economic housing units produced. With almost equal achievement rates (76.33, and 76.93 %, respectively), both sectors contributed proportionally to the small economic housing shortage.

The lowest total achievement rate (57.0 %) and a very low economic housing achievement rate (52.86 %) were observed *during the 1987/1997 period*; hence the largest annual housing shortage (-110274 units) including a very large annual economic housing shortage (-82118 units)¹³. Both sectors had equally low economic housing achievement rates and contributed proportionately to economic housing shortages. Nonetheless, the contribution of the public sector to economic housing production during the 1987/1997 *is unprecedented both in terms of share* (64.24 % of all economic units) *and number of units produced annually* (59192 units).

Table (1) Total and annual number of planned and produced unit by housing level and sector over the 1982/2013 period

Time period	Sector	Total number of Planned Units				Total number of produced units				shortages & surpluses				Achievement rates (%)				Sector share of shortage/surplus by sector planned share Ratio			
		Economic	Middle	UM&High	Total	Economic	Middle	UM&High	Total	Economic	Middle	UM&High	Total	Economic	Middle	UM&High	Total	Economic	Middle	UM&High	Total
1982/1987	Public	38200	9550	0	47750	29158	8923	1448	39529	-9042	-627	1448	-8221	76.33	93.43	-	82.78	1.02	0.81		1.50
	Private	91407	38200	13643	143250	70316	34935	24355	129606	-21092	-3265	10713	-13644	76.93	91.45	178.52	90.48	0.99	1.05	0.88	0.83
	Total	129607	47750	13643	191000	99474	43858	25804	169136	-30133	-3892	12161	-21864	76.75	91.85	189.14	88.55	1.00	1.00	1.00	1.00
1987/1997	Public	112274	28069	0	140343	59192	11972	666	71830	-53083	-16097	666	-68514	52.72	42.65	-	51.18	1.00	1.35		1.14
	Private	61926	36111	18337	116373	32891	24954	16769	74613	-29035	-11157	-1568	-41760	53.11	69.10	91.45	64.12	0.99	0.73	1.74	0.84
	Total	174200	64179	18337	256717	92083	36926	17435	146443	-82118	-27253	-902	-110274	52.86	57.54	95.08	57.04	1.00	1.00	1.00	1.00
1997/2007	Public	43377	4594	0	47971	31834	4427	1022	37283	-11543	-167	1022	-10688	73.39	96.37	-	77.72	0.49	0.36		0.60
	Private	124560	49119	18204	191883	44387	43938	24856	113181	-80173	-5181	6652	-78702	35.64	89.45	136.54	58.98	1.18	1.06	0.87	1.10
	Total	167937	53714	18204	239854	76221	48365	25878	150465	-91716	-5348	7674	-89390	45.39	90.04	142.16	62.73	1.00	1.00	1.00	1.00
2007/2013	Public	50000	0	0	50000	46424	2192	157	48772	-3576	2192	157	-1228	92.85	-	-	97.54	0.15	-	-	0.08
	Private	130000	50000	20000	200000	46245	52598	26070	124913	-83755	2598	6070	-75087	35.57	105.20	130.35	62.46	1.33	0.54	0.97	1.23
	Total	180000	50000	20000	250000	92669	54790	26227	173685	-87331	4790	6227	-76315	51.48	109.58	131.13	69.47	1.00	1.00	1.00	1.00
1982/2013	Public	66049	12077	0	78125	43051	7153	808	51013	-22997	-4923	808	-27112	65.18	59.23	-	65.30	0.74	2.21	-	1.00
	Private	100061	43332	17859	161252	45220	38038	22401	105660	-54841	-5294	4543	-55592	45.19	87.78	125.44	65.52	1.17	0.66	0.85	1.00
	Total	166110	55409	17859	239378	88272	45192	23210	156673	-77838	-10217	5351	-82705	53.14	81.56	129.96	65.45	1.00	1.00	1.00	1.00

Reference: Author based on Housing Sector/ Ministry of Housing, Utilities and Urban Development Data pertaining to production and plans covering the 1982/2013 period

Figure (1) Annual shortages by housing level (units) 1982/2013

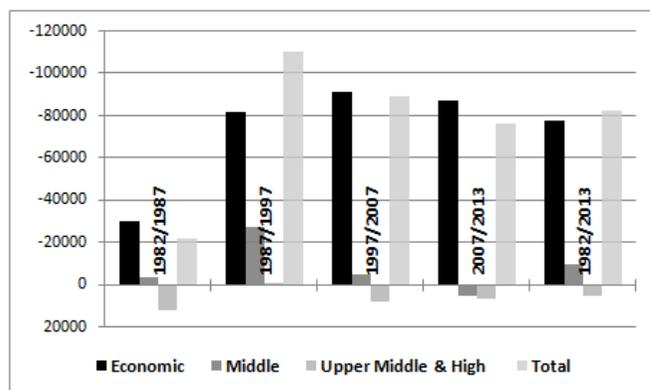


Figure (2) Annual Economic Housing Production (units) by sector 1982/2013

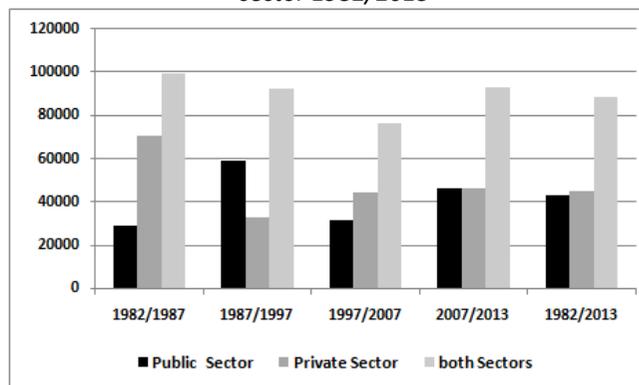
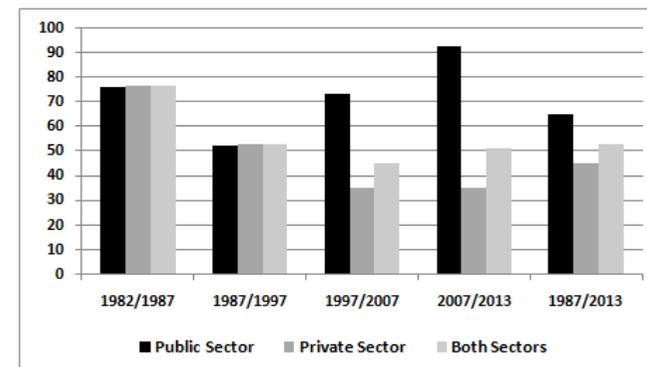


Figure (3) Economic Housing Achievement rates by sector 1982/2013



Reference: Author based on Housing Sector Data covering the 1982/2013 period

During the 1997/2007 period, annual economic housing shortages reached its peak (-91716 units) due to the very low economic housing achievement rate by the private sector relative to the public sector (35.6 % and 73.39 %, respectively). Similarly, annual economic housing shortages remained relatively high (- 87331 units) during the 2007/2013 due to the very low achievement rate by the private sector (35.57 %) relative to the public sector (92.9 %). The private sector contributed significantly more than the public sector to economic housing shortages during the 1997/2007 period and almost all shortages during the 2007/2013 period.

How did formal housing production respond to new households' needs during the different time periods?

As evident in Table 2, the 0.846 million units produced during the 1982/1987 period covered the needs of the 0.724 million newly formed HHs in all housing levels, in addition to a surplus of 121437 in all housing levels, to meet part of other housing plan components. Moreover, even though total and economic housing achievement rates during the 1987/1997 were very low (57.04 % and 52.86 %), the 1.494 million units produced covered the needs of the 1.242 million newly formed HHs in all income levels, allowing for a surplus of 221944 units, of which 77710 were economic housing units.

Table (2) Number of housing units produced and new HHs formed during the 1982/2013 period

	Housing and income levels	1982/1987	1987/1997	1997/2007	2007/2013	1982/2013
Number of New HHs by housing level	<i>Low income</i>	491450	843115	1487160	838884	3660608
	<i>Middle income</i>	181060	310621	475659	233023	1200364
	<i>Upper Middle & High</i>	51732	88749	161204	93209	394894
	Total	724242	1242485	2124023	1165117	5255866
Number of Housing Units produced by housing level	<i>Economic housing</i>	497369	920825	762211	556015	2736420
	<i>Middle income housing</i>	219292	369257	483654	328737	1400940
	<i>Upper Middle & High</i>	129018	174347	258780	157359	719504
	Total housing units	845679	1464429	1504645	1042111	4856864
Shortages and surpluses by Housing Level	<i>Economic</i>	5919	77710	-724949	-282869	-924188
	<i>Middle</i>	38232	58636	7995	95714	200576
	<i>Upper Middle & High</i>	77286	85598	97576	64150	324610
	Total	121437	221944	-619378	-123006	-399002

Reference: Author based on CAPMAS, Population Census 1976, 1987, 1996, 2006, 1st of January and Housing Sector data covering the period 1982/2013

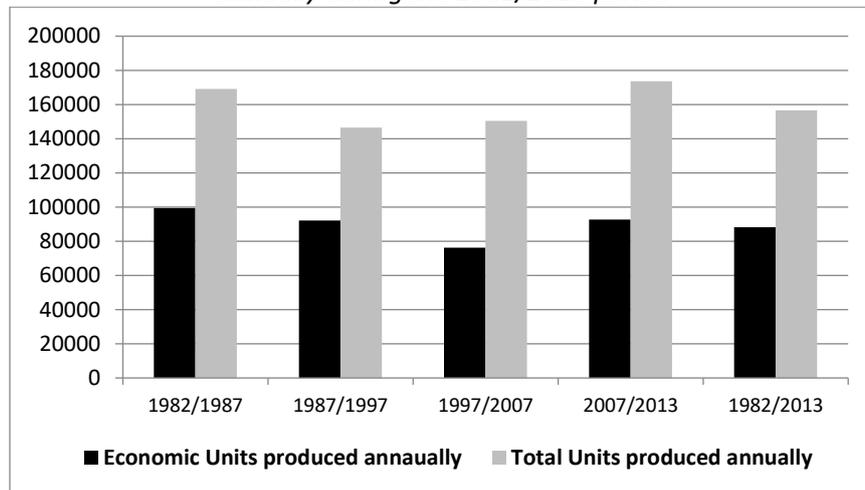
In contrast to preceding time periods, the 1.505 million units produced during the 1997/2007 while covered the needs of all newly formed middle and UM&H income HHs in addition to producing surpluses, failed to cover the needs of 0.725 million newly formed low income HHs, which account for 48.75 % of all HHs seeking economic housing and 34.13 % of all newly formed HHs. Similar to the 1997/2007 period, the 1.042 million units produced during the 2007/2013, covered the needs of middle income and UM&H income newly formed HHs in addition to producing surpluses, but failed to cover the needs of 0.283 million newly formed low income HHs, which account for 33.72 % of all low income HHs, and 24.28 % of all newly formed households. This shows that the extent of economic housing shortages during the 1997/2007 and 2007/2013 periods is particularly acute; and though there were middle income shortages, they are clearly not a major housing production issue.

What explains economic housing shortages?

Housing shortages in general and economic housing shortages more specifically are partially explained by the *inert production capacity* in the formal sector on one hand, *and the deviation of production* especially in the private sector from the plan over the 1982/2013 period, on the other. As

evident in Figure 4, there has been no evident growth in total and economic annual production capacity over the 1982/2013 period. The difference between total annual production during the 2007/2013 period (173685 units), and the 1982/1987 period (169136 units) was only 4549 units annually. Similarly, there has been no evident growth in annual economic housing capacity over the 1982/2013 period. In fact slightly more economic housing was produced annually during the 1982/1987 period (99474 units) than during the 2007/2013 period (92669 units). While there has been some growth in middle income production capacity, UM&High income production capacity remained relatively stable.

Figure (4) Number of total and economic housing units produced annually during the 1982/2013 period



Reference: Author based on Housing Sector Data 1982/2013

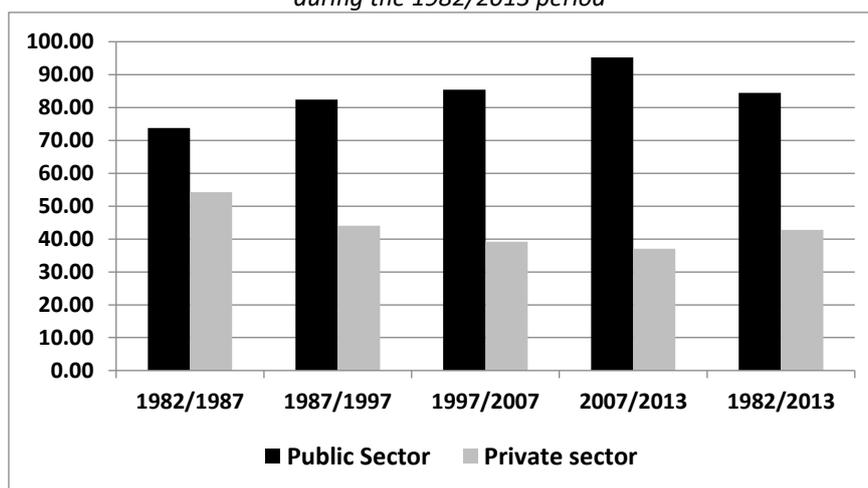
Inert production capacity is also observed in the private sector as evident in the small difference between annual units produced during the 1982/1987 period (129,606 units) and the 2007/2013 period (124,913 units). As for economic housing, the private sector produced more economic units during the 1982/1987 period (70,316 units annually) relative to all other time periods. Annual total and economic production capacity in the public sector over the whole 1982/2013 period was 51,013 units including 43,051 economic units, which are clearly within the targets set by the 2002/2017 Housing Plan (50,000 units, all of which are economic units) and explains its sound performance.

In addition to inert production capacity, *the deviation of production from planned shares has greatly contributed to economic housing shortages*. As evident in Table 4, of total produced units over the 1982/2013 period, the share of economic housing fell behind planned share (53.34 % and 69.4 % respectively), middle income housing units' share was higher than planned share (28.84 % and 23.15 %), and UM&High income housing units' share was almost double its planned share (14.81 % and 7.46 %). The shift away from economic housing towards middle and UM&High income housing is most evident during the 1997/2007 and 2007/2013 time periods. Moreover, as illustrated in Figure 5, the shift is most evident in the private sector which has continuously dedicated smaller shares of its production to economic housing over the whole 1982/2013 period. The share of economic housing to total private sector production declined from a high of 54.25 % during the 1982/1987 period to a low of 37.02 % during the 2007/2013 period. In contrast, a trend of increasing economic housing shares are observed in the public sector over the 1982/2013 period.

Table (3) Distribution of Planned Units and Produced Units by Housing Level and Sector 1982/2013

Time period	Sector	Distribution of Planned Unit by Housing Level				Distribution of Produced Units by Housing Level			
		Economic	Middle	Upper Middle & High	Total	Economic	Middle	Upper Middle & High	Total
1982/1987	Public	80.00	20.00	0.00	100.00	73.76	22.57	3.66	100.00
	Private	63.81	26.67	9.52	100.00	54.25	26.95	18.79	100.00
	Total	67.86	25.00	7.14	100.00	58.81	25.93	15.26	100.00
1987/1997	Public	80.00	20.00	0.00	100.00	82.41	16.67	0.93	100.00
	Private	53.21	31.03	15.76	100.00	44.08	33.44	22.47	100.00
	Total	67.86	25.00	7.14	100.00	62.88	25.22	11.91	100.00
1997/2007	Public	90.42	9.58	0.00	100.00	85.38	11.87	2.74	100.00
	Private	64.91	25.60	9.49	100.00	39.22	38.82	21.96	100.00
	Total	70.02	22.39	7.59	100.00	50.66	32.14	17.20	100.00
2007/2013	Public	100.00	0.00	0.00	100.00	95.19	4.49	0.32	100.00
	Private	65.00	25.00	10.00	100.00	37.02	42.11	20.87	100.00
	Total	72.00	20.00	8.00	100.00	53.35	31.55	15.10	100.00
1982/2013	Public	84.54	15.46	0.00	100.00	84.39	14.02	1.58	100.00
	Private	62.05	26.87	11.08	100.00	42.80	36.00	21.20	100.00
	Total	69.39	23.15	7.46	100.00	56.34	28.84	14.81	100.00

Reference: Author based on Housing Sector/ MHUDUC Data pertaining to production and plans 1982/2013

Figure (5) Share of Economic Housing to total produced units by Sector during the 1982/2013 period

Reference: Author based on Housing Sector Data covering the 1982/2013 period

The analyses of formal housing production at the national level, shows that the extent of economic housing shortages during the 1997/2007 and 2007/2013 periods is particularly acute; and though there were middle income shortages (-30100 units annually), they are clearly not a major housing production issue. During this period, the formal sector failed to provide housing for more than one million newly formed low income households. Both the inert production capacity in the formal housing sector over the 1982/2013 period, and the private sector's shift away from economic housing towards middle income and UM&High income housing over the 1997/2013 period partially explains large economic housing shortages.

Housing Production at the Governorate Level

The analyses of housing production at the governorate level attempts to answer the following questions: i) what is the extent of formal sector housing shortages/surpluses during the 1996/2006 and 2006/2013 time periods?; ii) is there over production during the 1996/2006 period? and what is its impact on increasing rates of vacant and closed units?; iii) what is the respective contribution of the formal and informal sectors to actual housing production and household formation?; and iv) what are their respective shares of overproduction?. In addressing these questions, focus is on identifying whether there are regional/governorate variations or not.

Are there variations among governorates with respect to the extent of formal housing shortages/surpluses during the 1996/2006 & 2006/2013 time periods?

During the 1996/2013 period, only 2.380 million units of the 4.128 million planned units were produced in the Study Area, yielding a total net shortage of -1.747 million units (comprised of an actual shortage of -1.881 million units and a small surplus of + 0.134 million units). As presented in Table 4, formal production trends during the 1996/2006 and 2006/2013 time periods are similar, with relatively low achievement rates (55.41 % and 60.44 %, respectively), and high annual real shortages (-0.106 million and -0.113 million units, respectively). Variations, however, are evident at the governorate level.

As illustrated in Figures 6 and 7, during the 1996/2006 period, the formal sector only achieved planned targets in the governorates of Damietta (200.16 %), Qena (131.42 %), Luxor (116.31 %), and Sharkia (105.09 %). Jointly these five governorates achieved a small annual surplus (+ 4150 units) which is very small in comparison to the large annual shortage incurred by the remaining governorates (-105727 units). Very low achievement rates are observed in the governorates of Menya, Qalyoubia, Gharbia, Alexandria, Assuit, and Behira. Housing shortages in the GCR and Alexandria governorate were extensive accounting for 66.4 % of total shortages during this period.

Similarly during the 1996/2013, the formal sector achieved planned targets in nine governorates which jointly produced a small annual surplus (+14,119 units), in comparison to the large annual shortage (-111,689 units) incurred by the remaining governorates. Achievement rates varied significantly from very high achievement rates in the governorates of Luxor Aswan, Damietta, and Qena; and very low achievement rates (less than 50%) in the governorates of Alexandria, Qalyoubia, Behira, Gharbia, Giza, Dakhliya, and Port Said. During this period, production in Upper Egypt as a whole achieved its planned target (101.8 %) while Lower Egypt achieved only 70.1 % of its planned target. The extent of housing shortages during this period was significant in the GCR and the Alexandria governorate as they jointly accounted for 78.5 % of total shortages.

In sum, during the 1996/2013 period, only a few small and medium size governorates achieved small surpluses while the largest governorates incurred significant shortages. In contrast to 1986/1996¹⁴, Upper Egypt had the highest achievement rate during the 1996/2013 period (82.3 %) compared to all other regions.

Table (4) Achievement rates and annual shortages and surpluses at the governorate level July 1996/2006 and July 2006/31st December 2013 periods

Governorate	Achievement Rate (produced units/planned units)- %			Annual shortages/surpluses		
	1996/2006	2006/2013	1996/2013	1996/2006	2006/2013	1996/2013
Cairo	48.82	57.09	52.52	-19393	-17525	-18593
Qalyoubia	26.53	28.86	27.58	-13441	-14314	-13815
Giza	48.91	41.71	45.65	-18147	-22799	-20141
Greater Cairo Region	44.41	45.4	44.85	-50981	-54638	-52548
Alexandria	36.82	22.25	30.3	-16492	-21927	-18821
PortSaid	49.4	41.94	46	-3543	-4534	-3968
Suez	81.76	105.43	92.61	-1167	392	-499
Urban Governorates	46.33	39.7	43.34	-21203	-26069	-23288
Damietta	200.16	181.58	191.83	1682	1485	1597
Dakhliya	81.79	30.66	58.85	-1967	-8127	-4607
Sharkia	105.09	125.24	114.16	382	2072	1107
Kafr Al Skeikh	47.32	70.02	57.53	-2519	-1562	-2109
Gharbia	34.2	37.1	35.49	-7055	-7233	-7131
Menoufia	89.84	118.76	102.91	-560	1137	167
Behira	44.43	34.92	40.19	-5140	-6462	-5707
Ismailia	94.78	123.51	107.9	-208	1049	331
Lower Egypt	71.64	70.05	70.93	-15384	-17642	-16352
Beni Suef	75.4	110.07	91.16	-987	449	-371
Fayoum	56.56	72.39	63.78	-1846	-1311	-1617
Menya	24.19	60.48	40.24	-5521	-3043	-4459
Assuit	43.41	65.02	52.81	-5181	-3288	-4370
Sohag	75.02	91.98	82.49	-1818	-612	-1301
Qena	131.42	169.49	147.38	1816	3864	2694
Luxor	118.31	212.42	158.64	269	1653	862
Aswan	76.37	188.4	127.15	-742	3067	891
Upper Egypt	66.93	101.75	82.26	-14010	779	-7672
Study Area	55.41	60.44	57.67	-101578	-97570	-99860

Reference: Author based on Housing Sector Data 1996/2006 and 2006/2013.

Figure (6) Achievement rates in the Study Area during the 1996/2006 period

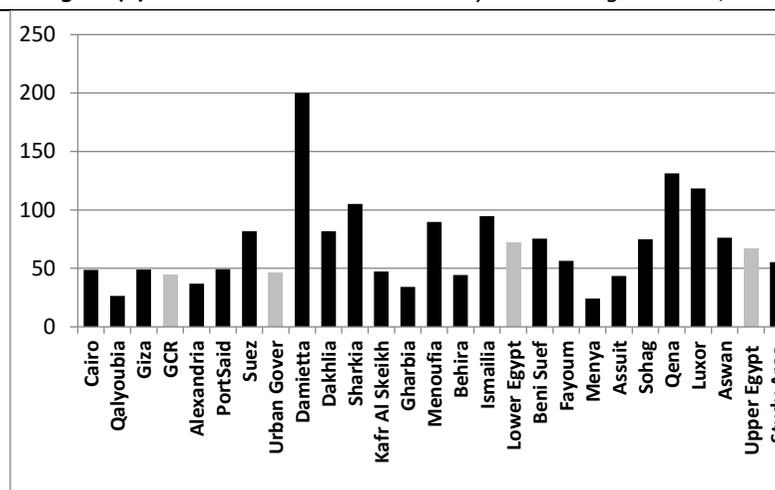
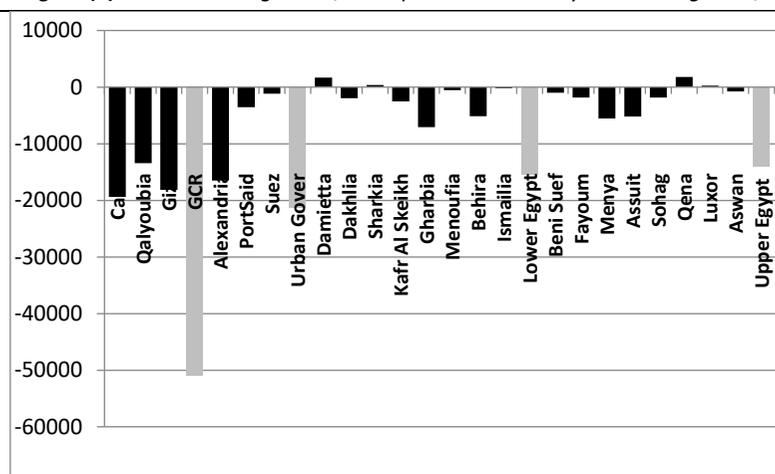


Figure (7) Annual Shortages and/or Surpluses in the Study Area during 1996/2006 period



Reference for figures 6 & 7: Author based on Housing Sector Data 1996/2006

What is the extent of the problem of vacant and closed units at the governorate level?

Similar to the national level, housing production rates were higher than new household formation rates in all governorates, during the 1996/2006 as presented in Table 5, indicating a continuous trend of overproduction similar to that observed during the 1986/1996 period. Exceptionally high HP/HF ratios were observed in the governorates of Alexandria, Qalyoubia, Suez, Damietta, Assuit, Sohag, Qena and Luxor. The correlation analyses shows that there is moderate positive correlation between the HPR/HFR ratio and the percent growth in vacant units ($r= 0.613$) and the percent growth in unused units ($r=0.519$) during the 1996/2006 period, respectively; which means that the higher the ratio (the higher overproduction) the higher the increase in percent vacant and unused units.

There were no evident regional variations with respect to percent unused units in 2006. However at the governorate level lower rates are observed in the governorates of Port Said, Ismailia and Aswan, and higher rates are observed in the governorates of Sohag, Damietta, Qena, Assuit and Luxor. Governorates that experienced noticeable increases in percent unused units during the 1996/2006 period include: Qena, Qalyoubia, Behira, Menya, Beni Suef, and Kafr El Skeikh. As illustrated in Figure 8, variations among governorates and regions with respect to percent vacant and closed units for are however more evident. Lower Egypt, relative to all other regions, had the highest percent vacant units (24.3 %) and the lowest percent closed units (4.3 %) in 2006. It is worth noting that 67.6 % of all closed units (0.625 million units) and 57.2 % of vacant units (1.401 million units) in the Study Area in 2006, are in the GCR and Alexandria governorate. The moderate negative correlation between the percent vacant units and the percent closed units in 1996 and 2006 ($r = -0.56$ and 0.53 , respectively), suggests that when the percent vacant units is high, the percent closed units is low and vice versa

What is the respective contribution of the formal and informal sector to actual housing production?

As presented in Table 6, housing units in Urban Egypt, increased from 8.631 million units in 1996 to 12.092 million units in 2006 yielding a net change of 3.461 million units. Taking into consideration the absolute decline in the number of whole house and single room units, which amounted to - 413873 units over the 1996/2006 period¹⁵, facilitated by the replacement of rural houses with apartment buildings, houses, and villas, then actual change in housing units amounts to 3.874 million units. Given that during the July 1996/July 2006 period, the formal sector produced 1.345 million units, then the informal sector produced 2.530 million units accounting for 65.27 % of actual change in housing units. If units for large projects and resorts are included then the formal sector produced 1.472 million units and the informal sector the remaining 2.402 million units accounting for 62.01 % of total housing unit change.

Actual housing unit change in the Study Area during the 1996/2006 period amounts to 3.663 million units including a net change of 3.255 million units and 408705 units that were replaced or demolished. As formal production during the 1996/2006 period amounted to 1.262 million units, then the informal sector produced 2.401 million units accounting for 65.54 % of total unit change. As evident in Figure 9, there are large variations among governorates with respect to informal sector share of actual housing production during the 1996/2006 period. Governorates with very high informal sector shares include Qalyoubia, Alexandria, Menya, and Cairo. Governorates with very low informal sector shares include Suez, Qena, Port Said, and Ismailia. The correlation analyses shows that informal share of housing production is positively correlated with population size ($r=0.447$), and percent informal population ($r=0.461$).

Table 5: Household formation and housing production rates during the 1996/2006 period and percent vacant, closed, unused units in 1996 and 2006

Governorate	HHs formation rate	Housing production rate	Ratio HPR/HHFR	Percent Vacant units %		Percent Closed for availability of other residence %		Percent Unused Units %	
				1996/2006	1996*	2006	1996	2006	1996
Cairo	6.43	10.64	1.65	14.2	16.1	5.8	8.8	20.0	24.8
Qalyoubia	9.65	18.61	1.93	10.3	24.3	5.4	6.7	15.7	31.1
Giza	9.25	10.58	1.14	25.8	22.3	1.2	8.5	27.0	30.8
Greater Cairo Region	7.59	11.69	1.54	17.3	19.0	4.4	8.4	21.6	27.4
Alexandria	8.26	17.82	2.16	14.8	21.8	9.3	9.9	24.1	31.7
PortSaid	6.84	8.94	1.31	20.3	15.1	3.1	6.1	23.4	21.2
Suez	6.30	13.92	2.21	12.3	18.8	6.4	5.6	18.6	24.4
Urban governorates	7.91	16.43	2.08	15.2	20.9	8.4	9.2	23.6	30.1
Damietta	7.18	14.85	2.07	22.0	29.6	5.4	5.3	27.4	34.8
Dakhliya	6.60	12.95	1.96	19.8	24.9	1.8	3.6	21.6	28.5
Sharkia	8.50	14.18	1.67	22.8	25.7	4.4	5.0	27.3	30.7
Kafr Al Skeikh	7.48	11.83	1.58	16.6	20.6	2.0	5.5	18.6	26.0
Gharbia	6.47	11.09	1.71	19.8	23.3	2.2	3.9	22.0	27.2
Menoufia	8.30	13.43	1.62	21.9	27.1	5.7	4.3	27.6	31.4
Behira	7.28	8.75	1.20	15.9	22.5	1.9	3.7	17.8	26.1
Ismailia	6.77	12.32	1.82	12.7	18.3	8.1	4.2	20.8	22.5
Lower Egypt	7.28	12.28	1.69	19.5	24.3	3.4	4.3	22.9	28.6
Beni Suef	7.42	11.08	1.49	10.5	13.0	9.0	14.0	19.6	27.0
Fayoum	8.89	11.43	1.28	14.6	15.9	5.8	9.6	20.4	25.5
Menya	7.72	12.90	1.67	17.4	14.1	3.3	15.7	20.8	29.8
Assuit	6.89	13.67	1.99	19.8	22.7	5.2	10.6	25.1	33.3
Sohag	5.68	12.34	2.17	23.0	26.8	3.6	8.7	26.7	35.4
Qena	7.21	14.40	2.00	19.0	26.3	4.6	7.0	23.6	33.3
Luxor	8.12	17.53	2.16	16.6	29.6	3.2	3.4	19.8	33.0
Aswan	7.91	10.70	1.35	15.8	17.1	3.9	4.9	19.7	22.1
Upper Egypt	7.29	12.75	1.75	17.8	20.5	4.8	10.0	22.7	30.6
Study Area	7.52	12.79	1.70	17.5	20.7	4.9	7.9	22.4	28.6

Reference:: Author based on CAPMAS Census of Buildings and Units 1996 and 2006

* vacant units in 1996 estimated based on number of closed units reported in 1996 Preliminary Results

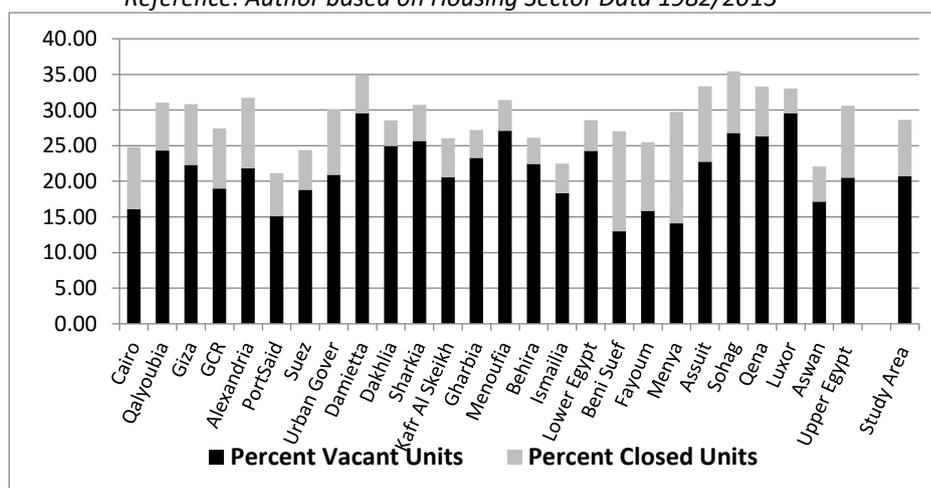
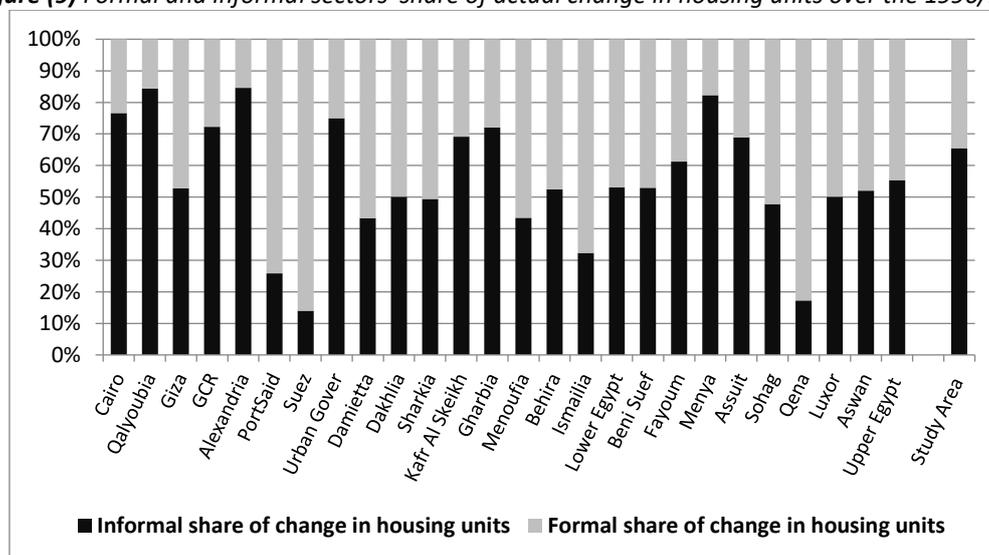
Figure (8) Percent vacant and closed units (unused units) in the Study Area Governorates 2006
Reference: Author based on Housing Sector Data 1982/2013

Table (6) Actual Change in Housing units during the 1996/2006 period in the formal and informal sectors

Governorate	Number of Housing Units		Net Change 1996/2006	Absolute Decline in Units 1996/2006	Actual Change in Housing units 1996/2006			Share of Actual Change in housing units %	
	Jul-96	Jul-06			Total	Formal	Informal	Formal	Informal
Cairo	2316966	3045748	728783	61151	789934	184980	604954	23.42	76.58
Qalyoubia	476958	757655	280697	30815	311512	48529	262983	15.58	84.42
Giza	1219965	1526791	306826	60930	367756	173702	194054	47.23	52.77
Greater Cairo Region	4013888	5330194	1316306	152896	1469201	407211	1061990	27.72	72.28
Alexandria	1145683	1742328	596645	28006	624650	96132	528518	15.39	84.61
PortSaid	151998	194610	42612	4042	46654	34596	12058	74.15	25.85
Suez	130688	189418	58730	2084	60814	52312	8502	86.02	13.98
Urban Governorates	1428369	2126355	697987	34132	732119	183040	549079	25.00	75.00
Damietta	151248	204205	52958	6361	59319	33607	25712	56.65	43.35
Dakhlia	392662	549600	156937	20162	177099	88362	88737	49.89	50.11
Sharkia	322470	462083	139613	16505	156118	78982	77136	50.59	49.41
Kafr Al Skeikh	152071	212917	60846	12475	73321	22628	50693	30.86	69.14
Gharbia	342491	460588	118097	13217	131314	36662	94652	27.92	72.08
Menoufia	174784	249113	74329	13218	87547	49484	38063	56.52	43.48
Behira	247523	316210	68687	17748	86435	41105	45330	47.56	52.44
Ismailia	107914	152633	44720	11035	55755	37730	18025	67.67	32.33
Lower Egypt	1891162	2607350	716188	110721	826909	388560	438349	46.99	53.01
Beni Suef	124552	173518	48966	15238	64204	30229	33975	47.08	52.92
Fayoum	125007	176665	51658	10371	62029	24034	37995	38.75	61.25
Menya	187608	271418	83809	15439	99248	17622	81626	17.76	82.24
Assuit	217339	322757	105418	22726	128144	39751	88393	31.02	68.98
Sohag	203602	288065	84463	20223	104686	54610	50076	52.17	47.83
Qena	137401	212753	75351	16384	91735	75965	15770	82.81	17.19
Luxor	45453	75010	29557	5330	34887	17391	17496	49.85	50.15
Aswan	107783	152539	44755	5245	50000	23975	26025	47.95	52.05
Upper Egypt	1148747	1672725	523978	110956	634934	283577	351357	44.66	55.34
Study Area	8482166	11736624	3254458	408705	3663163	1262388	2400775	34.46	65.54
Urban Egypt	8631435	12092013	3460578	413873	3874451	1345496	2528955	34.73	65.27

Reference: Author based on CAPMAS Census of Buildings and Units 1996 and 2006 and Housing sector production 1996/2006

Figure (9) Formal and informal sectors' share of actual change in housing units over the 1996/2006

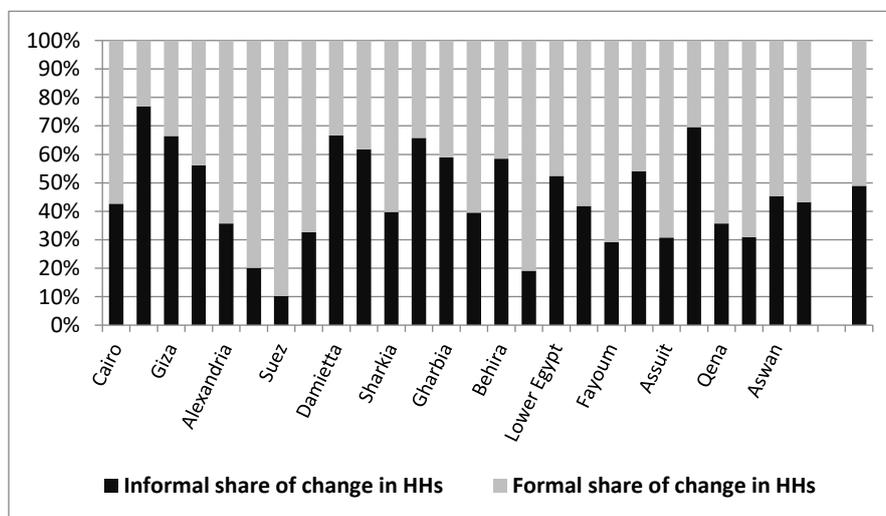
Reference: Author passed on Census of Buildings and Units and Household's Living Conditions 1996. 2006

What is the respective contribution of formal and informal areas to Actual Change in Households during the 1996/2006?

Actual change in HHs in the Study Area during the 1996/2006 period includes net change in HHs (formal and informal) in addition to HHs (formal and informal) that have moved out of substandard housing during this period. During the 1996/2006 period, informal population in the study areas increased from 10.491 million to 13.610 million and accounted for a higher share of total urban population in 2006 than 1996 (43.07 % and 41.22 %). As evident from Table 7, there are wide variations among governorates in percent informal population, with very high percentages in the governorates of Sohag, Qalyoubia, Giza Damietta, Gharbia, and Behira; and very low shares in the governorates of Suez and Port Said. In addition, very high informal population growth rates during the 1996/2006 period are observed in the governorates of Giza, Qalyoubia, Sharkia, Menoufia, Kafr El Sheikh, Luxor and Fayoum. Based on the respective shares of formal and informal HHs, net change in Households in the Study Area during the 1996/2006 which amounted to 1.914 million HHs included 0.977 million formal HHs and 0.937 million informal HHs.

During the 1996/2006 period, the percent HHs living in substandard housing declined from 15.97 % to 7.84 % as 0.325 million HHs moved out of substandard housing¹⁶. The North/South divide remains in 2006, as 20.56 % of HHs in Upper Egypt lived in substandard housing compared to 6.15 % in the GCR, 4.97 % in urban governorates, and 5.11 % in Lower Egypt. By proportionately allocating the number of HHs that moved out of substandard units to net change in formal and informal HHs, actual change in households during the 1996/2006 period amounts to 2.240 million HHs, including 1.143 million formal HHs accounting for 51.0 % of total HH change and 1.197 informal HHs accounting for 49.0 % of total HH change. As illustrated in Figure 10, informal population accounted for very high shares (over 60%) of actual HHs change in the governorates of Qalyoubia, Sohag, Damietta, Giza, Kafr El Sheikh, Dakhlia and Gharbia. Lower informal shares of actual HH change are observed in Suez, Ismailia, Port Said and Fayoum, Assuit and Luxor. At the regional level, informal HHs accounted for higher shares of HH change in the GCR and Lower Egypt relative to Upper Egypt and Urban Governorates.

Figure (10) Formal and informal sectors' shares of actual change in HHs over the 1996/2006



Reference: Author based CAPMAS 1996, 2006 and MLD 2007

Table (7) Actual change in households during the 1996/2006 period in the formal and informal sectors

Governorate	Percent informal Population (%)		population growth rate (1996/2006) %		Net Change in HHs in study Area 1996/2006			Percent HHs in substandard housing units based on unit type		HHs moving out of substandard units 1996/2006	Actual Change in HHs in study Area 1996/2006			Share of Actual Change in housing units %	
	July 1996	July 2006	Informal	Urban	Total	Formal	Informal	1996	2006		Total	Formal	Informal	Formal	Informal
Cairo	37.86	38.86	1.79	1.51	440858	252786	188072	11.60	7.41	-38761	479619	275012	204607	57.34	42.66
Qalyoubia	51.91	59.48	3.84	2.45	145561	33573	111988	11.25	4.25	-16463	162024	37370	124654	23.06	76.94
Giza	53.86	57.40	3.21	2.18	268098	89902	178195	11.34	4.16	-30560	298658	100151	198508	33.53	66.47
Greater Cairo Region	43.86	46.85	2.79	1.82	854517	376262	478255	11.50	6.15	-85784	940301	412533	527769	43.87	56.13
Alexandria	37.19	36.81	1.99	2.20	276717	177964	98752	12.81	4.65	-53021	329738	212064	117674	64.31	35.69
PortSaid	15.19	16.30	2.62	1.91	32600	26035	6566	8.29	7.65	0	32600	26035	6566	79.86	20.14
Suez	10.30	10.28	2.05	2.06	26583	23863	2720	5.77	4.60	0	26583	23863	2720	89.77	10.23
Urban Governorates	32.05	31.91	2.02	2.16	335900	227862	108038	11.63	4.97	-53021	388921	261961	126960	67.36	32.64
Damietta	50.85	54.43	2.56	1.85	25606	8542	17064	3.48	1.29	-703	26309	8777	17532	33.36	66.64
Dakhlia	53.96	55.66	1.83	1.49	80025	30603	49422	8.68	2.79	-14047	94072	35974	58097	38.24	61.76
Sharkia	30.04	32.70	3.28	2.43	83728	50399	33329	16.46	8.30	-11060	94788	57057	37731	60.19	39.81
Kafr Al Skeikh	41.29	47.54	3.17	1.71	38482	13171	25312	17.10	3.86	-13345	51827	17738	34089	34.23	65.77
Gharbia	52.78	54.11	1.52	1.24	68901	28302	40599	10.68	3.96	-14123	83024	34103	48921	41.08	58.92
Menoufia	26.42	30.03	3.35	2.03	45962	27783	18179	28.45	11.37	-15573	61535	37196	24339	60.45	39.55
Behira	51.95	53.60	1.89	1.54	57155	23740	33414	17.69	3.43	-26937	84092	34929	49163	41.54	58.46
Ismailia	41.16	36.12	0.55	1.85	24581	19894	4687	15.01	6.90	-5080	29661	24006	5655	80.93	19.07
Lower Egypt	44.72	46.46	2.14	1.73	424440	202434	222006	14.36	5.11	-100868	525308	249780	275528	47.55	52.45
Beni Suef	35.98	37.50	2.50	1.98	32783	19057	13726	36.36	23.91	-4205	36988	21501	15487	58.13	41.87
Fayoum	24.72	26.01	3.00	2.38	40201	28471	11730	32.79	19.03	-5423	45624	32311	13312	70.82	29.18
Menya	46.33	48.40	2.60	2.06	50180	23017	27164	34.16	19.39	-12428	62608	28717	33891	45.87	54.13
Assuit	26.73	27.74	2.18	1.78	53104	36787	16317	33.06	17.03	-17092	70196	48627	21569	69.27	30.73
Sohag	59.82	61.92	2.06	1.68	38867	11822	27046	27.97	12.65	-16920	55787	16968	38820	30.42	69.58
Qena	30.14	31.61	2.62	2.13	37727	24243	13484	45.35	25.59	-11667	49394	31740	17654	64.26	35.74
Luxor	24.73	26.37	3.39	2.76	13693	9459	4233	47.12	15.55	-10547	24240	16746	7494	69.08	30.92
Aswan	46.57	46.24	1.91	1.98	33112	18079	15033	55.50	34.60	-7195	40307	22007	18300	54.60	45.40
Upper Egypt	38.48	39.71	2.34	2.00	299666	170933	128733	37.11	20.56	-85477	385143	218616	166527	56.76	43.24
Study Area	41.22	43.07	2.37	1.86	1914523	977490	937032	15.97	7.84	-325150	2239673	1142889	1096783	51.03	48.97

Reference: Author based CAPMAS 1996, 2006 and MLD 2007

What is the extent of over production at the regional/governorate levels?

During the 1996/2006 period, the formal sector was responsible for 51.0% of actual change in households and 34.5 % of actual change in housing units, while the informal sector was responsible for 49.0% actual households change and 65.5 % of actual change in housing units. Clearly the 3.663 million units added during the 1996/2006 period exceeded actual change in HHs (2.239 HHs) by some 1.423 million units, leading to an overproduction rate of 63.6 %. As evident in Table 8, the formal sector accounted for 25.2 % of total overproduction (0.358 million units) while the informal sector accounted for 74.8 % of total overproduction (1.065 million units). Urban governorates had the highest over production rate (88.2%) relative to the GCR, Lower Egypt and Upper Egypt (56.2 %, 57.4 %, and 64.9 %, respectively). Moreover, the informal sector accounted for very high shares of overproduction in the GCR (84.8 %) and Urban Governorates (88.9 %), relative to Lower Egypt (50.3 %) and Upper Egypt (63.4 %). As illustrated in Figure 11, there are wide variations among governorates with respect to percent over production, with extremely high rates in the governorates of Damietta, Suez; and very high rates in the governorates of Qalyoubia, Alexandria, Dakhlia, Ismailia Sohag, Qena, Assuit and Beni Suef; and lower rates in Giza, Aswan and Behira. The correlation analysis shows that over production is positively correlated with percent change in vacant units and percent change in ownership during the 1996/2006 ($r= 0.407$, $r= 0.517$, respectively).

What explains high over production rates?

There are wide variations in formal and informal achievement rates and shares of over production among the governorates in the study area as illustrated in Figures 12 and 13. The correlation analyses shows that there is a moderate negative relationship between informal and formal achievement rates ($r=-0.70$), which means that when one sector has a high achievement rate, the other sector has a lower achievement rate. However, while there is a moderate positive relation between percent over production and formal achievement rates ($r=0.551$), there is a very weak relationship with informal achievement rates (0.216). Several observations are worth noting:

1- Very high rates of overproduction (> 80 %) occur when:

- both the formal and informal sectors have high achievement rates, such as in Damietta (127.7 % and 97.7%, respectively), Dakhlia (93.9% and 94.3 %, respectively), and Sohag (97.9 % and 89.8 %, respectively);
- the formal sector has a very high rates, sufficient to cover all housing needs in addition to a surplus, while the informal sector has lower rates, such as in Suez ((196.8 % and 32.0 %, respectively), Qena ((153.8 % and 31.9 %, respectively), Ismailia ((127.2 % and 60.8 %, respectively)
- the informal sector has very high rates, sufficient to cover all housing needs, relative to the formal sector, such as in Qaluobia (162.3 % and 30.0 %, respectively), Alexandria (160.3 % and 29.2 %), and Assuit (125.9 % and 56.6 %).

2- Production in the formal sector was highly uneven - While the formal sector produced enough units to cover all housing needs in the governorates of Suez, Damietta, Ismailia, and Qena, it failed to cover housing needs in the remaining governorates, and even failed to cover formal HHs needs in the governorates of Cairo, Alexandria, Fayoum, Menya, and Assuit. Accordingly, informal sector production was necessary in many governorates to meet formal housing shortages as well as informal HHs needs.

Table (8) Contribution of the informal and formal sector to overproduction during the 1996/2006 in the Study Area

Governorate	Achievement Rate 1: total unit change by sector/total HH change			Percent Over production	Achievement rate 2: change in units/HH change by sector			Number of overproduced units during the 1996/2006 period			Share of overproduction	
	total	formal	informal		total	formal	informal	total	formal	informal	formal	informal
Cairo	164.7	38.6	126.1	64.7	67.3	295.7	310315	0	310315	0.0	100.0	
Qalyoubia	192.3	30.0	162.3	92.3	129.9	211.0	149488	11159	138329	7.5	92.5	
Giza	123.1	58.2	65.0	23.1	173.4	97.8	69097	69097	0	100.	0.0	
Greater Cairo Region	156.2	43.3	112.9	56.2	98.7	201.2	528900	80256	448643	15.2	84.8	
Alexandria	189.4	29.2	160.3	89.4	45.3	449.1	294913	0	294913	0.0	100.0	
Port Said	143.1	106.1	37.0	43.1	132.9	183.7	14054	8561	5493	60.9	39.1	
Suez	228.8	196.8	32.0	128.8	219.2	312.6	34231	28449	5782	83.1	16.9	
Urban Governorates	188.2	47.1	141.2	88.2	69.9	432.5	343198	37011	306187	10.8	89.2	
Damietta	225.5	127.7	97.7	125.5	382.9	146.7	33010	24830	8180	75.2	24.8	
Dakhlia	188.3	93.9	94.3	88.3	245.6	152.7	83028	52388	30640	63.1	36.9	
Sharkia	164.7	83.3	81.4	64.7	138.4	204.4	61330	36917	24413	60.2	39.8	
Kafr Al Skeikh	141.5	43.7	97.8	41.5	127.6	148.7	21494	4890	16604	22.7	77.3	
Gharbia	158.2	44.2	114.0	58.2	107.5	193.5	48291	2559	45732	5.3	94.7	
Menoufia	142.3	80.4	61.9	42.3	133.0	156.4	26012	12288	13724	47.2	52.8	
Behira	102.8	48.9	53.9	2.8	117.7	92.2	2343	2343	0	100.	0.0	
Ismailia	188.0	127.2	60.8	88.0	157.2	318.7	26094	13724	12369	52.6	47.4	
Lower Egypt	157.4	74.0	83.4	57.4	155.6	159.1	301601	149939	151662	49.7	50.3	
Beni Suef	173.6	81.7	91.9	73.6	140.6	219.4	27216	8728	18488	32.1	67.9	
Fayoum	136.0	52.7	83.3	36.0	74.4	285.4	16405	0	16405	0.0	100.0	
Menya	158.5	28.1	130.4	58.5	61.4	240.8	36640	0	36640	0.0	100.0	
Assuit	182.6	56.6	125.9	82.6	81.7	409.8	57948	0	57948	0.0	100.0	
Sohag	187.7	97.9	89.8	87.7	321.8	129.0	48898	37642	11256	77.0	23.0	
Qena	185.7	153.8	31.9	85.7	239.3	89.3	42342	42342	0	100.	0.0	
Luxor	143.9	71.7	72.2	43.9	103.9	233.5	10648	645	10002	6.1	93.9	
Aswan	124.0	59.5	64.6	24.0	108.9	142.2	9694	1968	7726	20.3	79.7	
Upper Egypt	164.9	73.6	91.2	64.9	129.7	211.0	249791	91325	158466	36.6	63.4	
Study Area	163.6	56.4	107.2	63.6	110.4	219.0	1423490	358531	106495	25.2	74.8	

Reference: Author based on Housing Sector Data 1996/2006, and CAPMAS 1996 and 2006

Figure (11) Percent overproduction during the 1996/2006 period

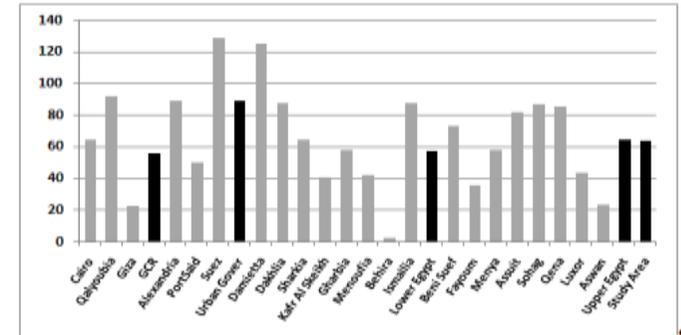


Figure (12) Achievement rates in the formal and informal sectors 1996/2006

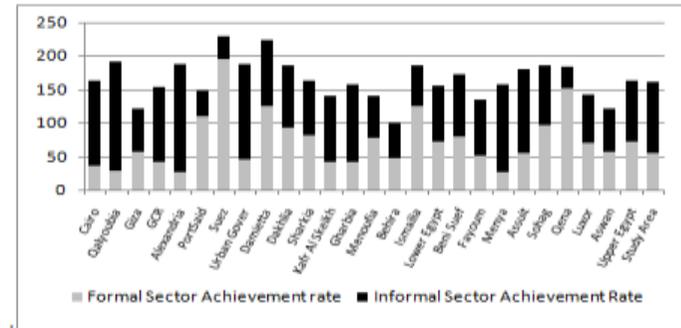
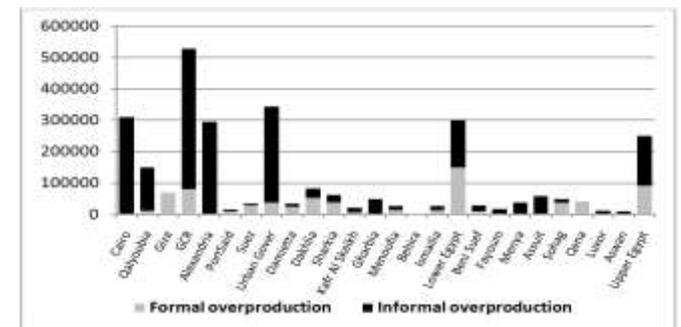


Figure (13) Number of overproduced units by the formal and informal sectors during the 1996/2006



Reference: Author based on Housing Sector Data 1996/2006, and CAPMAS 1996 and 2006

- 3 *However, Informal sector production was excessive in a many governorates* - Informal production (2.400 million units) was sufficient to cover all housing needs in the Study Area during the 1996/2006 period (2.239 million HHs) and at the governorate level, it was sufficient to cover:
- all housing needs in the governorates of Cairo, Alexandria, Qalyoubia, Gharbia, Menya, and Assuit, in addition to a large surplus;
 - very high shares of housing needs in the governorates of Damietta (97.7 %) , Dakhliya (94.3 %), Kafr El sheikh (97.8 %), Beni Suef (94.9 %), Sohag (89.8 %);and,
 - all the housing needs of informal HHs in addition to a surplus in all governorates except for small shortages in Giza, Qena, and Behira.
- 4- *Overproduction in the informal sector is highly concentrated*- The governorates of Cairo, Qalyoubia and Alexandria jointly accounted for 69.8 % of total informal overproduction. If we add the governorates of Gharbia, Kafr El Sheikh, Menya, Assuit, and Fayoum, then the 8 governorates accounted for 98.0 % of total informal sector overproduction.

What is the respective contribution of the formal and informal sector to over production?

In occlusion, while informal production is responsive to formal production ($r= 0.7$), it is not responsive to actual needs and has an inherent tendency to overproduce. Three groups are identified in Exhibit 1 and Map 1 with respect to the contribution of the informal sector to over production.

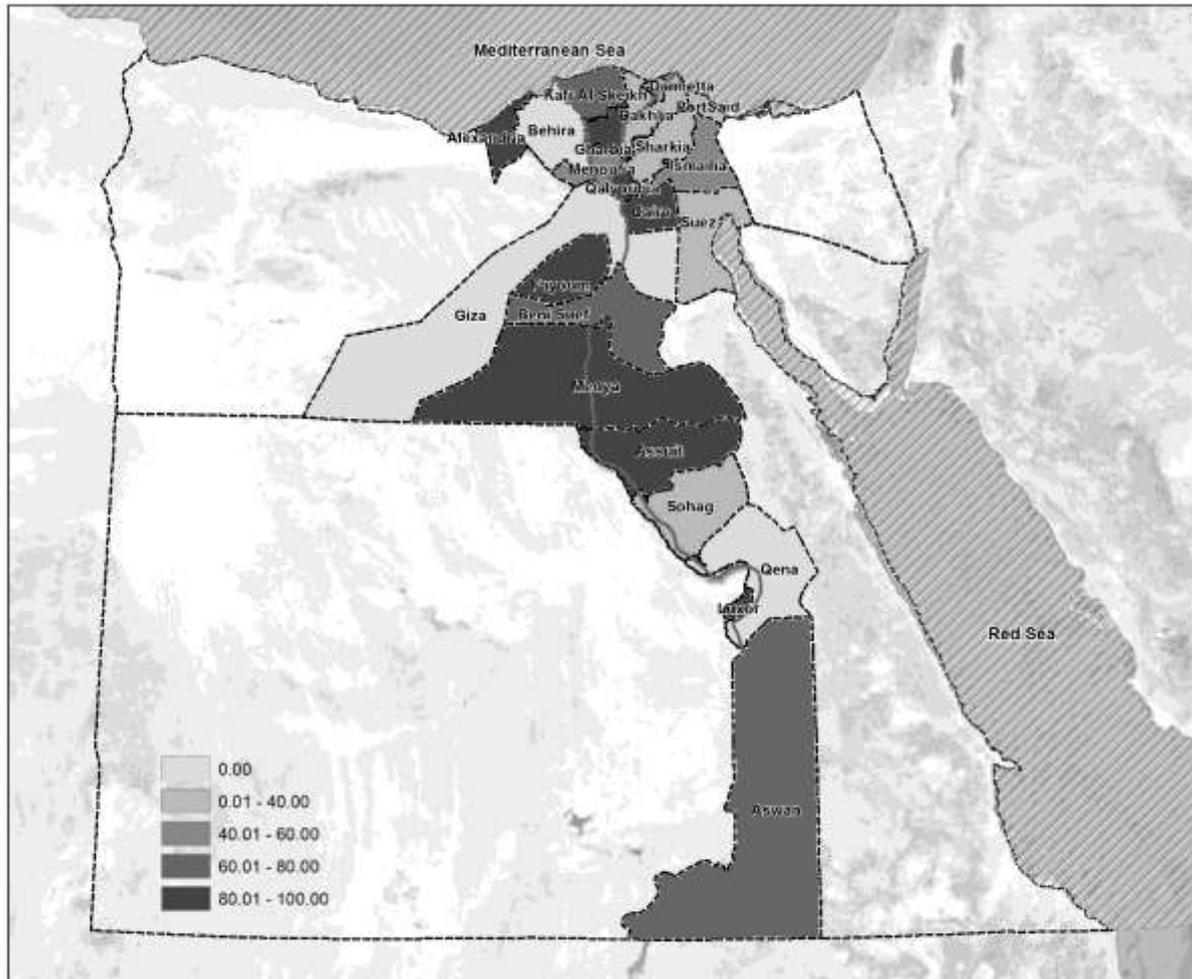
- The informal sector contributed very high shares of over production in the governorates of Cairo, Qalyoubia, Alexandira, Gharbia, Kafr El Sheikh, Fayoum, Menya, Assuit, Beni Suef, and Luxor^{xvii}.
- The formal sector contributed very high shares of over production in the governorates of Giza, Behira, Damietta, Suez, Port Said, Dakhliya, Sharkia, and Qena and Sohag^{xviii}.
- Both the formal and informal sector contributed almost proportionate shares of over production in the governorates of Menoufia and Ismailia.

Exhibit (1) Formal and Informal shares of overproduction during the 1996/2006 in the Study Area

	Informal sector has high share of overproduction			formal sector has high share of over production			both sectors have equal shares of overproduction					
	Governorate	% informal sector	% formal sector	Governorate	% formal sector	% informal sector	Governorate	% formal sector	% informal sector			
GCR	Cairo	100.0	0.0	Giza	100	0.0						
	Qalyoubia	92.5	7.5									
Urban Governorates	Alexandria	100.0	0.0	Suez	83.1	16.9						
				Port Said	62.8	37.2						
Lower Egypt	Gharbia	94.7	5.3	Behira	100	0.0				Menoufia	47.2	52.8
	Kafr Al Skeikh	77.3	22.7	Damietta	75.2	24.8						
				Dakhliya	63.1	36.9				Ismailia	52.6	47.4
				Sharkia	60.2	39.8						
Upper Egypt	Fayoum	100	0.0	Qena	100.0	0.0						
	Menya	100	0.0	Sohag	77.0	23.0						
	Assuit	100	0.0									
	Luxor	93.9	6.1									
	Aswan	79.7	20.3									

Beni Suef	67.9	32.1
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Map (2) Informal sector share of overproduction in the Study Area during the 1996/2006 period



Reference: Author based on Housing Sector Data 1996/2006, and CAPMAS 1996 and 2006

Main Findings and Policy Implications

The analyses of formal housing production at the national level over the 1982/2013 period shows that the extent of economic shortages especially during both the 1997/2007 and 2007/2013 periods was unexpectedly high, as it failed to provide housing for more than one million newly formed low income households. In contrast, middle income shortages were not a major production issue. Both the inert production capacity in the formal housing sector over the 1982/2013 period, and the private sector's shift away from economic housing towards middle income and UM&High income housing over the 1997/2013 period partially explain large economic housing shortages.

The analyses of formal housing at the governorate level during the 1996/2006 and 2006/2013 time periods, shows that only a few small and medium size governorates achieved small housing surpluses while the largest governorates in the GCR and Alexandria incurred significant housing shortages. Moreover, in contrast to 1986/1996 production bias toward urban governorates, Upper Egypt had the highest achievement rate during the 1996/2013 period compared to all other regions. This calls for more efficient targeting of formal housing production, especially in housing programs, to governorates most in need, in

addition to establishing sound monitoring and evaluation systems to ensure that units are occupied and not left vacant or closed.

Housing production rates were higher than new household formation rates during the 1996/2006 in all governorates in the Study Area, clearly establishing a continuous trend of overproduction, similar to that observed during the 1986/1996 period, which has significantly contributed to the growing stock of vacant and closed units. High vacancy rates are particularly an oversupply problem, especially in governorates where small percentages of HHs still live in substandard housing. In governorates, especially in Upper Egypt, the many poor households still living in substandard housing are unable to access the large vacant housing stock. In contrast, closed units for availability of other residence, and units under the old rental law are bounded by regulatory constraints. The risks associated with new rental arrangements, are among the main reasons for withholding owned units from the market. Currently, the new rental law is being revisited to encourage owners to release closed units into the rental housing market. Renters keeping old rental units closed, however, have limited rental options under the new rental law. While there are many social and economic issues interrelated with the old rental law, it remains a serious housing problem and among the main factors contributing to the major shift in housing towards ownership on one hand, and the continuous deterioration of buildings on the other, as landlords have no incentives to maintain them.

The analyses of formal and informal housing production during the 1996/2006, showed that the informal sector has contributed significantly more than the formal sector to actual housing production, (65.3 % and 34.7 %, respectively) while both sectors contributed almost proportionate shares to actual households change (49 % and 51 %, respectively). Clearly the 3.663 million units added during the 1996/2006 period exceeded actual change in HHs (2.239 HHs) by some 1.423 million units, leading to an overproduction rate of 63.6 %. The formal sector accounted for 25.2 % of total overproduction (0.358 million units) while the informal sector accounted for 74.8 % of total overproduction (1.065 million units). The informal sector contributed very high shares of over production in the governorates of Cairo, Qalyoubia, Alexandria, Gharbia, Kafr El Sheikh, Fayoum, Menya, Assuit, Luxor, Aswan and Beni Suef. In contrast, the formal sector accounted for very high shares of overproduction in the remaining governorates, except for Menoufia and Ismailia, where both sectors contributed almost proportionate shares.

The analyses of overproduction also revealed that *Production in the formal sector was highly uneven*. While the formal sector produced enough units to cover all housing needs in the small governorates of Suez, Damietta, Ismailia, and Qena, it failed to cover housing needs in the remaining governorates, and even failed to cover formal HHs needs in the governorates of Cairo, Alexandria, Fayoum, Menya, and Assuit. Accordingly, informal sector production was necessary in these governorates to meet formal housing shortages as well as informal HHs needs. However, *Informal sector production was excessive in many governorates*. Total informal production during the 1996/2006 was sufficient to cover: all housing needs in the Study Area; all housing needs in the governorates of Cairo, Alexandria, Qalyoubia, Gharbia, Menya, and Assuit; very high shares of housing needs in the governorates of Damietta, Dakhliya, Kafr El sheikh, Beni Suef, Sohag; and, all informal HHs housing needs except for

small shortages in the governorates of Giza, Qena, and Behira. The governorates of Cairo, Qalyoubia and Alexandria jointly accounted for 69.8 % of total informal overproduction.

To conclude, while informal housing production has been responsive to formal production shortages in many governorates, it has not been responsive to actual needs and has an inherent tendency to overproduce. The informal sector has contributed more to housing production and overproduction during the 1996/2006 period than during the 1986/1996 period; which indicates that while production in the formal sector remained inert, over production in the informal sector is ungovernable. Both issues call for the State to strengthen its role as enabler, coordinator and provider of housing for those most in need, on one hand, and as regulator of housing production on the other hand. To expand sector growth, adequate incentives need to be provided to encourage the private sector to produce more economic housing, accompanied by adequate measures to ensure transparency and accountability. The problem of excessive informal production, however, is a problem of governance, which necessitates more stringent controls measures, especially in large urban areas. Otherwise, ungoverned urban informal expansion will constrain the State's policies for accommodating future expansion to designated locations and protecting agricultural land.

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End Notes

¹ The Housing Sector identifies four housing levels: economic housing which includes low cost housing; middle income, upper income and high income housing, respectively.

² The Ministry of Local Development (MLD) reported that informal population reached 12.158 million in 2007. The Informal Settlements Development Facility (ISDF) under the Ministry of State for Urban Renewal and Informal settlements reported that in May 2014, informal areas (both unplanned and unsafe areas) accounted for 37.5 % of the total built-up urban area. Moreover, there is consensus that the informal growth will be particularly acute in the Greater Cairo Region (GCR). According to ISDF, the GCR alone has 123 unsafe areas (of the total 422 unsafe areas) with a population of 340,000, accounting for 34.6 % of total unsafe area population in Egypt (about one million).

³The analysis of the housing stock mainly focuses on housing units in residential buildings, as all other forms of housing are considered temporary, substandard and small in terms of numbers. In urban Egypt in 2006, there were 3.1478 million buildings for residence, 0.208 million buildings for work, and 0.069 million substandard buildings. Buildings for residence include a total of 14.282 million units of which 12.145 million units are for housing and 2.137millionare non-housing units (which are not intended for housing such as shops, garages, others); some of the latter are used for housing but are relatively small in terms of numbers (10620 units for all urban Egypt in 2006). Buildings for work also contain housing and non-housing units; however, only 6922 units of the 0.459 million units in buildings for work were used for housing in 2006. Moreover, of the 69345 Gawazi buildings, only 10760 buildings were used for housing.

⁴The Census defines vacant units as untenured complete and closed units for several reasons such as incomplete finishing, utilities not connected, high cost, and units located in unsuitable floors, etc. Unused units include vacant units in addition to closed units for availability of other residence.

⁵According to 2006 Census, in new towns, 55 % of units are owned, 12.0 % are ordinary rent, and 30.8 % are untenured.

⁶According to the Building Census Data, during the 1986/2006 period (no data reported for 1996), the percent housing units owned increased from 35.16 % to 45.57 %, the percent units under ordinary rent declined from 45.36 % to 30.56 %, and the percent untenured units increased from 15.3 % to 19.68 %, which are mostly vacant units. In 2006, of all units in New Towns, 55 % of units are owned, 12.0 % are under ordinary rent, and 30.8 % are untenured.

⁷ In 2006, 10.28 % of HHs lived in new law rental units, 29.3 % of HHs lived in old law rental units, and 58.49 % of HHs owned their units.

⁸Very low shares of HHs living in old law rental units in 2006 are observed in Lower and Upper Egypt (15.5 % and 14.5 %, respectively) compared to the GCR (40.0 %) and urban governorates (35.1 %).

⁹Based on HH living condition Census data, substandard housing in urban areas includes single room, room/s in unit, shacks/tents, and graveyards). The shift from substandard units towards apartments during the 1996/2006 period is further reflected in: declining crowding ratios from 1.2 to 1.12 in 2006 facilitated by declining percent urban population living in small units (1&2 rooms) from 14.45 % to 7.59 %; increased in unit connection to potable water from 85.85 % to 95.17 %, and increased connection to sanitary drainage facilities from 74.78 % to 80.93 %.

¹⁰The number of planned units in each housing level and sector were prepared in collaboration with the Housing Sector to reflect targets established in Housing Plans covering the different time intervals.

¹¹Frontier governorates have experienced exceptionally high achievement rates over the 1996/2013 period and have accounted for 8.15 % of total production which exceeded its share of total 2006 population (2.6 %) as well as its share of planned units (1.26 %). The Study Area includes the remaining governorates in the Nile Delta and Valley which account for about 97.7 % of Egypt's population in 2006.

¹²Planned units at the governorate level were calculated based on Housing Plans to reflect the July 1996/2006 and July 2006/31st December 2013 for which formal sector production data is available. The 1997/2002 Housing Plan defined total urban annual housing needs at 216180 units, including: 129520 units to meet population growth (59.9 %), 55390 units to meet rehabilitation needs (25.6 %), 16617 units to compensate for unexecuted units from previous plans (7.7 %), and 14653 units to replace single rooms (6.8 %). The 2002/2017 Plan identified total urban annual needs at 250000 units comprising 173071 units (69.23 %) to meet population growth, 55390 units (22.16 %) to meet rehabilitation needs, and 21539 units (8.62 %) to compensate for unexecuted units from previous plans. Plans do not include units for mega project and tourism.

¹³Relative to all time periods, the 1987/1997 Housing Plan assigned very high shares of total production (54.67 %), and economic housing production (64.45 %), respectively, to the public sector. This entailed that the public sector is to produce 112274 economic housing units annually, which clearly is beyond its capacity as well as the joint capacity of both sectors to produce economic housing at any given time period over the 1982/2013 period.

¹⁴Formal production in Upper Egypt during the 1986/1996 period was very low in all governorates except for Luxor and Qena. Upper Egypt as a whole accounted for 7.5 % of total formal production, while it accounted for 14.8 % of total population in 1996 (Bakr, 2006b).

¹⁵Replaced/demolished units account for 64.10 % of the 637580 units targeted in the 1997/2007 Housing Plan for rehabilitation and replacement. While some rehabilitation units are not accounted for in the Census data, they are relatively small compared to actual production.

¹⁶The shift in housing unit type has been towards apartments. This shift in unit type has led major improvements in several related housing indicators such as crowding, percent HHs in small units, access to potable water and sanitary drainage networks, and availability of cooking and bathing facilities (Egypt National Report Habitat III, 2015, section 7: Indicators).

^{xvii}The correlation analyses shows that high informal achievement rates and consequently high shares of total overproduction ($r=0.709$) are observed in governorates with large population size ($r= +0.43$), with high percent informal population ($r=0.42$) and where there is a high percent of HHs living in old law rental units ($r=0.42$). Moreover, informal achievement rates are positively related with percent growth in unused units over the 1996/2006 ($r= 0.437$).

^{xviii}High formal achievement rates and consequently high shares of total overproduction ($r=0.655$) are observed in governorates with small population size ($r= -0.38$), low percent informal population ($r=-0.43$), where there is a high percent of HHs living in new law rental units ($r= 0.48$). Moreover, formal achievement rates are negatively associated with percent growth of Closed Units over the 1996/2006

إنتاج الإسكان في حضر مصر: جمود القطاع الرسمي وصعوبة التحكم في نمو القطاع غير الرسمي

ملخص

من خلال تحليل إنتاج الإسكان في القطاع الرسمي والقطاع غير الرسمي على المستوى القومي والمحافظات، تثبت هذه الورقة ان إنتاج الإسكان الرسمي خلال الفترة ٢٠١٣/١٩٨٢ يتسم بالجمود في معدلات النمو، بالإضافة إلى انحراف كبير عن برنامج الإسكان مما أدى إلى نقص كبير في وحدات الإسكان الاقتصادي، إلا انه ليس فقط المحرك الرئيسي للإنتاج في القطاع غير الرسمي وان الإفراط في إنتاج الوحدات السكنية هو سمة أصيلة في القطاع غير الرسمي؛ وانه على الرغم من استجابته للعجز الكبير في الوحدات السكنية الرسمية في عدة محافظات، إلا انه حجم إنتاج القطاع غير الرسمي اكبر بكثير من الاحتياجات الإسكانية الفعلية وبالتالي ساهم في ارتفاع نسبة الوحدات الخالية والمغلقة، لوجود مسكن آخر للأسرة. وأظهرت التحليلات ان ثبات الإنتاج في القطاع الرسمي وتحول القطاع الخاص بعيدا عن الإسكان الاقتصادي نحو الإسكان المتوسط خاصة خلال ١٩٩٦/٢٠٠٦ و٢٠١٣/٢٠٠٦ يفسران بشكل جزئي النقص الكبير في وحدات الإسكان الاقتصادي. كما تشير تحليلات إنتاج الإسكان الرسمي على مستوى المحافظات خلال الفترتين ١٩٩٦/٢٠٠٦، ٢٠٠٦/٢٠١٣ الى ان معدلات انجاز مرتفعة بالإضافة الى فوائض صغيرة تحققت في عدد قليل من المحافظات الصغيرة والمتوسطة الحجم، بينما عانت اغلب المحافظات خاصة محافظات القاهرة الكبرى والإسكندرية من معدلات انجاز منخفضة جدا وعجز كبير في عدد الوحدات السكنية. وأظهرت تحليلات إنتاج الإسكان في القطاعين الرسمي وغير الرسمي خلال الفترة ١٩٩٦/٢٠٠٦ الى ان إنتاج فائض قدره ١,٤ مليون وحدة سكنية. كما ان الإنتاج في القطاع الرسمي اتسم بعدم التكافؤ وعدم قدرته على تلبية الاحتياجات الإسكانية في العديد من المحافظات. بينما اتسم القطاع غير الرسمي بالإنتاج المفرط للوحدات السكنية حيث استحوذ على ما يقرب من ٧٤,٨٪ من إجمالي الفائض من الوحدات السكنية المنتجة خلال الفترة ١٩٩٦/٢٠٠٦، هذا بالإضافة الى التركيز الشديد حيث تركز ٧٠٪ من إجمالي الفائض في محافظات القاهرة والإسكندرية والقليوبية.

شكر وتقدير

يود الكاتب أن يشكر الدعم والمساعدة التي قدمها قطاع الإسكان، والمرصد الوطني الحضري، بوزارة الإسكان والمرافق والمجمعات العمرانية، وعلى وجه التحديد المهندس حسين الجبالي لتعاونه في توفير خطط الإسكان وبيانات إنتاج الإسكان والتي اعتمد عليها هذا البحث.