Assessing Housing Needs in Gaza

June 2007- December 2011

SHELTER SECTOR GAZA

Shelter Sector Coordination
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The continuously growing housing shortage in Gaza is driven by conflict and rapid natural population growth. Construction and reconstruction cannot accommodate the needs due to the lack of building materials. The human dignity crisis increases day by day and has resulted in widespread difficulties for Gaza residents to access their right to adequate housing. Overcrowding is now a major issue in a context where long term and chronic overcrowding can lead to greater protection concerns including increased domestic violence, gender based violence and the general breakdown of social and cultural norms. The lack of access to adequate raw building materials resulting from the Israeli and Egyptian blockade remains the major reason for the chronic lack of progress in Gaza. The Shelter Sector in Gaza has recently carried out this study which calculates over 70,000 additional housing units are required.

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ABSTRACT

This study provides an estimation of the accumulated housing needs in the Gaza strip as a result of the ongoing four year blockade on Gaza and the concurrent rapid population growth since 2007. This assessment of needs is based on growth projections of households and housing units stemming from baseline data established by the 2007 census, conducted in Gaza by the Palestinian Central Bureau of Statistics (PCBS). The head of household rate method, recommended by the United Nations Department of Economic and Social Affairs committees involved in these fields, is the methodology used in this study to predict the growth of households. This assessment also considered the need for replacing existing marginal, substandard, depreciated, and destroyed housing units in its final analysis, as well as the number of units required to relieve current over-crowding levels in Gaza.

The results of this study show that, by the end of 2011, a total of 71,234 housing units are required in Gaza to address current population needs. This includes 67,151 units needed since June, 2007, and an accumulated shortage of 4,083 units prior to 2007. The results show that about 79% of the housing needs are due to natural population growth, and about 9% are due to destruction of housing during and prior to the 2008/2009 "Cast Lead" military operation. Replacement of substandard and depreciated units account for 7% of the caseload, and requirements to relieve over-crowded units accounts for 5%.

1. **PURPOSE**

The purpose of this desk study was to attempt to quantify and model sources of housing needs in the Gaza strip at the end of 2011. While housing damage caused by Operation "Cast Lead" remains the immediate focus of the humanitarian community, it is important to consider and estimate other sources of housing shortages that currently exist and are likely to have an increased negative impact in the future. Housing shortages are of particular concern as they inevitably lead to overcrowding, which in turn negatively affects privacy and creates potential protection concerns for vulnerable groups. Consequently, quantifying the housing shortfall is seen as invaluable for both current and future planning and highlights increased challenges should the Israeli and Egyptian blockade of essential building materials continue.

This study used population modeling methodology to estimate current housing needs and replacement rates as a result of the following factors:
1. New Households Information.
2. Depreciated Housing.
3. Marginalized/Sub-Standard Housing.
4. Overcrowding.
5. Repairs of damaged units.

Several reasonable assumptions were made during the calculations, and the end results prove comparable to more qualitative estimations of the situation.

2. INTRODUCTION

Rapid population growth, combined with the blockade in Gaza, has resulted in widespread difficulties for Gaza residents to access their right to adequate housing. Almost two years after Israel announced an 'easing' of the blockade, it is worthwhile to calculate the accumulated housing needs during the blockade period and assess what has been met so far. As there has been mis-reporting and under-reporting about the housing needs in Gaza, the need for effective analysis of existing data on population growth and housing characteristics is widely recognised as a priority by governmental agencies responsible for housing planning as well as by human rights and humanitarian organizations.

For this kind of analysis, it is important to distinguish between assessing *housing needs* and *housing demand*. While the first estimates the *extent* of housing needs, the second estimates the *nature* of such needs[1] . This is because not all households want or can afford the same type of housing. What households want is always determined by social and cultural considerations, what they can afford will be determined by economic considerations, or affordability. Studying the nature of housing needs is beyond the scope of this research. The main objective of this report is to provide estimates on future household needs for new and upgraded housing units caused by the blockade 2007-2011. The Palestinian Central Bureau of Statistics (PCBS) defines the housing unit as *"a building or part of a building constructed for one household only, with one or more independent entrances leading to the public road without passing through another housing unit".[2]* The housing estimate is based on minimum acceptable housing standards regardless of households' affordability level.

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[1] Struyk. R, Hoffman. M, and Katsura. H., 1990. 'The Market for Housing in Indonesian Cities', Urban Institute Press, Washington
[2] Palestinian Central Bureau of Statistics, 2010. Housing Conditions Survey. Ramallah – Palestine

3. METHODOLOGY

The methodology used to estimate housing needs in the Gaza strip was based on statistical projections using census data available from the Palestinian Central Bureau of Statistics (PCBS) for 2007-2011. Five types of new housing needs were considered in this study:

1. The formation of new households as a result of natural population growth.
2. The need for replacing existing units which will have fully depreciated during the study period.
3. The need for replacing marginalised or substandard housing units.
4. The number of units required to relieve over-crowding levels.
5. The number of dwellings affected by military actions.

The population projections and housing needs estimates for the first four categories were provided until mid 2011. This is because no consolidated updated information is available about housing units built by citizens after mid 2011. Therefore, we will base the study on the assumption that construction works after mid 2011 will meet the need for that period and we will assess cumulative housing needs in the period from mid 2007- mid 2011. For the fifth category, updated figures on the repaired houses after mid 2011 will be subtracted from the total accumulated needs. Sections 3.1 through 3.5 of this report discuss each category in some detail.

3.1 New Households

The term household is defined as one person or a group of persons with or without a family relationship who live in the same housing unit, share meals, and make joint provision for food and other essentials of living.[3] There are several projection methods for the formation of new households such as Life Table method by Brown,[4] and vital statistics by Wolfgang Illing (1967).[5]

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[3] Palestinian Central Bureau of Statistics, 2010. Housing Conditions Survey. Ramallah – Palestine

[4] Brown, S. P., "Analysis of a hypothetical stationary population by family units - a note on some experimental 380-394.calculations Population Studies (London), vol. IV, No. 4 (March 1951), pp

However, internationally applied housing unit projection methods cannot be applied to the occupied Palestinian territory at the present time due to lack of necessary data.[6] This study therefore uses the head of household rate method where the kind of data used for this method has been made available through the PCBS census. The *'head of household method'*, first introduced by Robert Parker,[7] is recommended by the Department of Economic and Social Affairs of the United Nations.[8] It provides detailed and highly useful projections but is limited in the sense that it is not capable of approximating the process of formation and dissolution of households and cannot project the distribution of households by the number of household members or by the category of households.[9] For the purpose of this study, which aims at estimating the total needs of housing units, the head of household rate method provides sufficient information.

By 'head of household' we refer to the person who usually lives within the household and is considered as the head of the household by its other members. Often, he/she is the main decision-maker and responsible for the financial support and economic welfare of the household.

According to the PCBS, the calculation of the *head of household rate* to predict the formation of new families is as follows:

1. Assume each household normally requires one housing unit (79% of households in the occupied Palestinian territory are nuclear households).
2. The head of household rate was calculated using head of household rates by age and sex based on data of the 2007 Census.

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[5]   United Nations (1973). Methods of projecting households and families (United Nations publication, Sales No. E.73.XIII.2

[6] Palestinian Central Bureau of Statistics, 2004. Housing Units and Households Projection Methods in the Palestinian Territory up to 2010. (Arabic paper)

[7] Robert Parker, jr., "The Choice of Assumptions in Household and Family Projections", Proceeding of the World Population Conference, Belgrade 1965 (United Nations Publication Sales No. 66.XIII.7, 1965).

[8] United Nations (1989). Projection methods for integrating population variables into development planning. Module One: Conceptual issues and methods for preparing demographic projections. ST/ESA/SER.R/90.

[9] Palestinian Central Bureau of Statistics, 2009. Housing Projections up to 2017. Ramallah – Palestine

The head of household rate was calculated by dividing the number of households' heads of each division (Age/Sex) by the number of population in the same division and multiplying it by 100 according to the following formula:

$$Head\ of\ Household\ rate = \frac{NHH(10^+ by\ sex)}{NP(10^+ by\ sex)} * 100 \quad \ldots\ldots\ldots\ldots (1)$$

Where:

- NHH (10^+ by sex) = number of household heads (with age 10 years and above) by sex for a certain age group.
- NP (10^+ by sex) = population (with age 10 years and above) for the same age group by sex

The calculation of the ***estimates of the number of households for coming years*** is also based on the assumption that each household would continue living in one housing unit. The head of household rate is assumed to remain fixed. The number of households in a given year is estimated according to equation (2).

$$Number\ of\ Household\ heads\ for\ year\ of\ estimate =$$
$$\frac{HHA\ (10^+\ years\ by\ sex)\ X\ ENP\ (10^+\ years\ by\ sex)}{100} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:

- HHA (10 + years by sex) = head of household rate (with age 10 years and above) for a certain age group by sex.
- NP (with age 10 years and above) year of estimate population for the same age group by sex.

Based on the percentage of vacant and closed housing units with respect to the percentage of occupied housing units and, assuming that the number of vacant and closed units will remain with the same percentage, the ***number of housing units estimated*** in a certain year is given as:

$$Number\ of\ housing\ units = \frac{NHEY\ X\ PCVH}{POH} + NHEY \quad \ldots\ldots\ldots\ldots (3)$$

Where:
- NHEY = the number of households of the year of estimate
- PCVH = percentage of closed or empty housing units (Census data)
- POH = percentage of occupied housing units (Census data)

The 2007 PCBS census showed that about 10% of the housing units in Gaza are either vacant or closed.[10] The numbers of estimated households and the corresponding housing units for years 2008-2011 are summarised in table 1:

Table 1: Estimated number of annual needs of housing units due to new household formation

Year	Total Population	Number Of Households	Number of Estimated Housing Units	Annual Needs
2008	1,440,332	239,698	267, 067	21,444*
2009	1,486,816	249,862	278,391	11,324
2010	1,516,592	260,492	290,235	11,844
2011	1,546,924	272,777	303,923	13,688
Total				*58,300*

* Number of housing units in 2008 minus existing housing units in 2007 which equals to 245,623 according to PCBS census.

3.2 Depreciated housing units

Concrete brick is the main construction material for external walls in Gaza and accounts for 99% of Gaza buildings.[11] The depreciation of concrete buildings depends on several factors such as the quality of the building and the regularity of maintenance. The average life span for buildings in Gaza is assumed to range from 50 to 70 years.[12] Therefore, after an average of 60 years, concrete buildings will need to be replaced. The general census of housing and establishments, conducted by PCBS in 2007, provides data on the buildings used for habitation by the number of housing units in the building and the year of construction.[13] Using this data, it was found that around 24,077 housing units were built before 1967. Considering the average sixty years life span, and taking into account that a number of these buildings were established even before

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[10] Palestinian Central Bureau of Statistics, 2007. Population, Housing and Establishment Census 2007. Ramallah – Palestine

[11] Palestinian Central Bureau of Statistics, 2010. Housing Conditions Survey. Ramallah – Palestine

[12] Eng. Ahed Zohod, head of Engineering Association- Middle Area branch

[13] Palestinian Central Bureau of Statistics, 2007. Population, Housing and Establishment Census 2007. Ramallah – Palestine

1948, it is assumed that these 24,077 houses should be replaced by the end of year 2027, with an average annual replacement rate equal to:

$$\frac{Number\ of\ housing\ units\ established\ before\ 1967\ in\ year\ 2007 = (24,077)}{2027 - 2007 = (20)} = \textit{1,204 units}$$

3.3 Marginalised or Sub-standard housing units

The term *marginal* refers to substandard housing units that are no longer suitable for habitation. Examples of marginal units include: tents, cottages, booths, or establishments with tin walls and roofs. The number of such types of housing units dropped from 1,981 units in 1997 to 737 units in 2007,[14] with an annual replacement rate of (1,981 − 737) / 10 years = 124 units/year. This replacement is assumed to continue at the same rate in the successive four years under study.

3.4 Over-crowded housing units.

Housing crowding or housing density is measured by the number of individuals per single room. According to PCBS[15] calculation, houses with three persons or above per room are considered as over-crowded houses and need extra rooms to relieve crowding. The percentage of households with housing density of three persons or above per room are recorded in the PCBS yearly census books for selected years. It is clear from these records that there is a tendency with the households in Gaza to expand and relieve crowding; leading the percentage of crowded houses to go down year after year. To estimate the rate of expansion, figure 1 shows that the number of households in crowded houses decreases by approximately 1.37% each year.

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[14] Palestinian Central Bureau of Statistics. Statistical Abstract of Palestine, books 1 through 11; 1997 through 2010; Ramallah – Palestine

[15] Palestinian Central Bureau of Statistics, 2003. A study on assessing housing needs in Palestine. (Arabic paper)
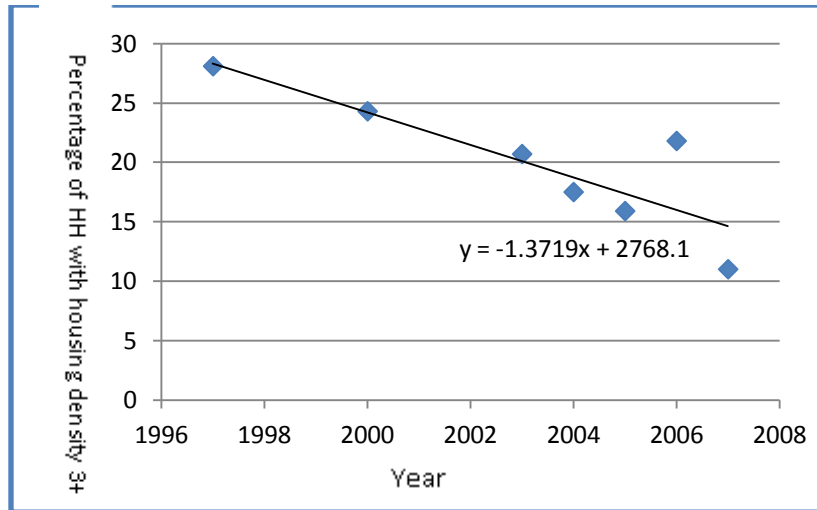
Figure (1): % Households with housing density of three persons/room or above

Assuming that each crowded household will build one room to relieve overcrowding, and that the average number of rooms in Gaza housing units is 3.6,[16] the number of housing units needed to overcome overcrowding per year equals the number of households with housing density of three or above divided by the average number of rooms per housing unit as described by equation 4 . Results for each year are summarised in the summary section Table 3.

$$Number\ of\ housing\ units\ to\ relieve\ overcrowding\ in\ a\ certain\ year =$$
$$\frac{decrease\ in\ percentage\ of\ crowded\ HH\ *\ number\ of\ HH\ in\ that\ year}{average\ number\ of\ rooms\ per\ house} \dots\dots\dots..(4)$$

3.5 Repairs for totally and partially damaged units

According to the Unified Shelter Sector Database (USSD),[17] 3,495 housing units have been totally destroyed, 2,733 major damaged, and 56,646 had minor damages as a result of the December 2008 – January 2009 "Cast Lead" military operation in Gaza. The recent update of the USSD shows that only 1200 units have subsequently been rebuilt by Ministry of Public works and Housing (MoPWH), UNRWA and other international agencies involved in the housing

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[16] Palestinian Central Bureau of Statistics. Statistical Abstract of Palestine, books 1 through 11; 1997 through 2010; Ramallah – Palestine
[17] Gaza shelter cluster, Unified Shelter Sector Database; reference: www.sheltergaza.org

sector. The USSD also shows that around 5,539 additional units have been totally destroyed as a result of military action since 2000, 4,083 of which are still in need of reconstruction. Table 2 summarises the totally and partially damaged housing units as a result of military action in Gaza before and after 2007 based on the USSD[18] databases.

Table 2: Totally and Partially Affected Housing Units by Military Actions

	Before 2007			After 2007		
	Total	Repaired	Not Repaired	Total	Repaired	Not Repaired
Totally Destroyed	5,539	1456	4083	3,495	1200	2295
Severely Damaged	26,521	17,536	8,985	2,733	875	1,858
Need for new construction	63,78 units					
Need for repair	10,843 units					

4. RESULTS SUMMARY

This study's findings on the annual and total housing needs are summarised in Table 3. According to OCHA, one to three percent of the natural growth needs in the first three years of the blockade (i.e., around 580 units) were met, and 10-15% of the annual need (i.e. about 1,966) were met after the Israeli announced blockade 'easing' in 2010 until March 2011.[19] Therefore, the total shortage in housing units by end of 2011 = *73,780 – (580+1,966) =71,234* units. These needs include a 67,151 unit increased shortfall from the period after June, 2007 as well as the 4,083 unit shortage accumulated prior to 2007.

Table 3: Results Summary

Source of housing needs	2008	2009	2010	2011	Totally destroyed after 2007
New Households Formation	21,444	11,324	11,844	13,688	6,378
Replacement for depreciated Units	1,204	1,204	1,204	1,204	
Replacement for marginal Units	124	124	124	124	
Relieving overcrowding	888	926	965	1011	
Total Needs	23,660	13,578	14,137	16,027	*73,780*
Has been met 2007-2011	2,546		*Total shortage*		*71,234*

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[18] Shelter Sector Database

[19] United Nations: Office for the Coordination of Humanitarian Affairs (OCHA), 2011. Assessing the humanitarian impact of the population of the Gaza strip (published report).

Figure 2 describes the relative percentage of each source of housing needs as described earlier. It was found that about 79% of such needs are due to natural population growth, and about 9% due to military action during and prior to the "Cast Lead" operation. Replacement of substandard and depreciated units account for 7%, whereas the requirement to relieve over-crowded units accounts for 5%.
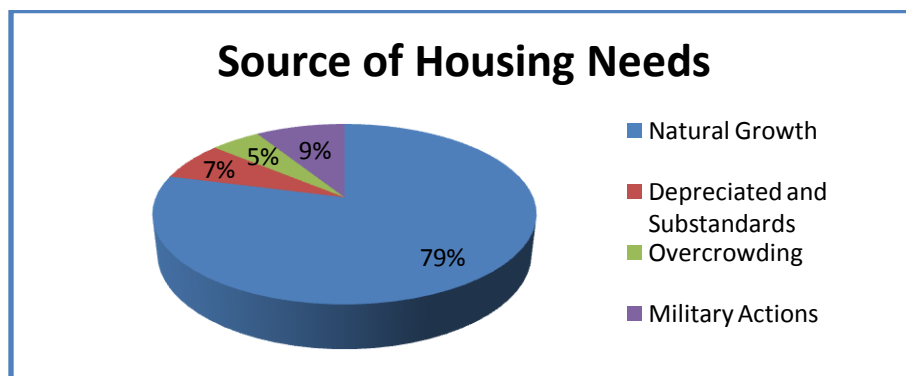

Figure 2: Relative distribution of housing needs with respect to the source of need

5. RECOMMENDATIONS

This research is based on available and reliable sources in Gaza. However, there is a significant amount of useful data which is not available in local databases, leading to some estimation for calculations. For example the number of housing units that were built during the blockade (2007-2011) is unclear. There are no exact figures available from government ministries on this issue. For the total housing units built in Gaza since 2007, twenty five individual municipalities had to be contacted, which was not feasible due to time limitations. Therefore, further research is needed to get a more comprehensive view of the situation.

An additional area for future research is on affordability levels for Palestinian households in Gaza, in order to assess the housing demand. An in-depth study of the demographic and social factors affecting the housing demand is also recommended.

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