

[PAPER/POSTER TITLE]

Heat insulation of buildings in Amman and its impact on energy saving and comfort for the Residents

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Overview

ABSTRACT

A significant proportion of residential apartments in Jordan are affected by moisture problems, mold growth on walls and thermal discomfort. These problems are mainly related to poor wall thermal insulation and lack of building quality control. The aim of this work is to quantify the percentage of thermally insulated buildings in Jordan, and to identify gaps in building codes enforcement system in order to inform policy makers and recommend remedy measures. A carefully designed questionnaire-based field survey was done for 500 residential apartment units in Amman, the questionnaire was aided with a ground-truthing Infrared Screening (IR) for building's envelopes to check the validity of answers in the filled questionnaires. Main findings of this work showed that only 5.8% of the 500 surveyed residential apartment units in Amman had thermal insulation. This unexpected result, not in line with the country's energy efficiency, climate, green buildings, and environmental plans. As a result of the recommendations from this research, a new regulatory and procedural changes underway from entities involved in building code violation, which will help augment enforcement of building codes apparently

The results show that the highest percentage of insulation was in the walls and the roof, where the percentage of houses that the insulation of 92.9%, while the proportion of housing that was isolated in the ceiling only 3.6%, and the percentage of isolated housing in the walls only and the part of the ceiling 1.8% each, Figure (11).

Methodology

A random simple sample was used on a group of blocks in two representative administrative districts (zonings), namely Alkoum and Alsahaba, in Amman City Figure (3), to be subjected to the survey (Table 1). The two districts were selected based on observing the spatial trends in housing expansion in the city, which was found to be accelerating faster in three directions of the city. But the southern part of the city was expanding at a faster rate than the northern and eastern directions, compared to a slower expansion to the west side due to fronting with the administrative boundaries of the nearby Albalqa and Madaba Governorates Figure (3). One of reasons behind the northern and eastern or northeastern housing expansion is attributed to a growing re-locating activity of big number of commuters to Amman from the second largest nearby city in Jordan, namely Zarqa City, bounding

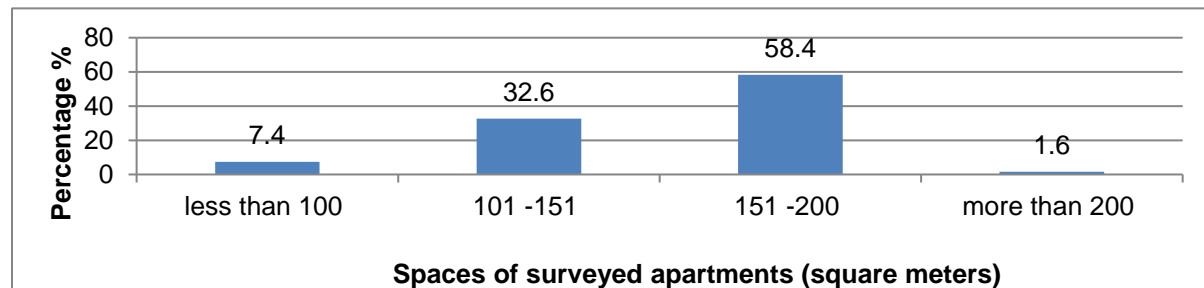


Amman totally from the north and northeast (Fig. 1). Those relocating commuters found the northern, northeastern and eastern parts of Amman close regions to their original places of residency in Zarqa. The southern expansion direction is mainly attributed to the vast open lands available for housing construction projects where administrative borders of the nearest major residential city in the south is faraway to restrict expansion, which now bypassed the international airport in the city, a place used to be a faraway landmark in southern Amman.

Fig. 1. A map of Jordan's governorates and boundaries and location of Amman City

Results

The questionnaire analyses revealed that 58.4% of the surveyed samples had an apartment area between 151 to 200 m² Figure (4), which is the common size of apartments for the middle class in Jordan, the latter equal to 70 per cent or more of the population in Jordan (Fanek, 2018).



Conclusions

- This was a first of its kind advocacy-oriented research in the history of the country to advocate a prolonged overlooked basic right, published based on original evidence data generated from a carefully-designed questionnaire and aided by a ground trothing state-of-the-art IR imagery technology;
- The absence of thermal insulation in dwellings in Amman (only 5.8% insulated) could be one of the main reasons of the high-energy consumption rate of the household sector in the national energy balance compared to other sectors;
- At the time of submitting this paper for publication, some fruits of the research-based organized advocacy campaign because of this project started to be cultivated. The campaign encompassed, after conducting the field survey, preparing a position paper, producing a short awareness-raising documentary uploaded on YouTube in Arabic (Abdel-Fattah, 2018), releasing media and press articles, and holding roundtable stakeholder meetings bounded representatives from the six building codes-involved [Format: single space, 10 point font, Times New Roman]

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