

# High-Rise Housing Reconsidered from an Integrated Perspective

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Studies about high-rise housing can be characterised by their diversity and disagreement. A variety of interpretations has been used to study the rationale and practices of constructing housing of this kind. The ambiguity of high-rise housing is partly related to the fact that the values and functions attributed to it have varied from continent to continent, between regions and within specific countries, both at one point in time and over long periods. This paper will reconsider high-rise housing in a broad ecological, political and social context including the experience of diverse individuals and groups. It will examine high-rise housing not only in terms of architectural, commodity and economic dimensions, but also in terms of personal experience, the health and well-being of the residents, and the use of resources. The merits and shortcomings of this kind of residential building will be considered in terms of their intended and unintended impacts.

**Keywords:** context, ecological perspective, high-rise housing, impacts.

## Tours d'Habitation Reexamine Selon Une Perspective Intégrative

La plupart des études sur les tours d'habitation se caractérisent par leur diversité et leur points de divergence. Nombre d'entre elles examinent le bien-fondé et les pratiques de construction des tours d'habitation. L'ambiguïté de ce type d'immeuble résidentiel est en partie dû au fait que les fonctions et les valeurs sous-jacentes varient d'un continent à l'autre, entre les régions et les pays d'un même continent et selon le moment considéré, ainsi qu'en fonction de périodes prolongées. La présente étude aborde les tours d'habitation selon une perspective à la fois écologique, politique et sociale y compris l'expérience humaine. Ce type d'habitation n'est pas uniquement repris en considération par rapport à l'architecture, la commodité et à l'économie, mais aussi simultanément par rapport à l'expérience personnelle et la santé, à l'utilisation des ressources, des valeurs symboliques ainsi qu'aux avantages et inconvénients de ce type de bâtiment y compris leurs impacts prévisibles et imprévisibles.

**Mots-clés:** contexte, perspective écologique, tours d'habitation, impacts.

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### INTRODUCTION

Publications on the nature of high-rise housing can be characterised by their disagreement. Several perspectives have been used to interpret the rationale and practice of constructing high-rise housing. The ambiguous status of high-rise housing is partly related to the fact that the purpose and functions of this kind of residential building have varied from continent to continent, between regions, and within specific countries both at any point in time and over long periods.

Residential buildings are human constructs par excellence because the "natural world" does not provide domestic space. Housing must be conceived and constructed. Human groups

and societies have a long tradition of providing domestic space in order to attain secure living conditions. The fact that housing units in the same society have quite different shapes and sizes, and that they are built with a range of construction materials suggests that factors other than pragmatic ones are of at least equal importance in determining their layout, construction and meaning. A comprehensive understanding of high-rise housing should take into account a range of social and cultural factors, some of which are tangible, whereas others are not. These factors can be identified and studied in relation to those collective decisions, lifestyles and responses that individuals and groups make in relation to domestic space and the broader environmental surroundings.

In contrast to common approaches, this paper will reconsider high-rise housing in a broad ecological and human context. It will discuss high-rise housing not just in terms of architectural, commodity and monetary dimensions, but also in terms of human experience, the use of resources and societal values. From this perspective, the next two sections discuss theoretical and methodological principles. Then the rationale for high-rise housing, the merits and shortcomings of this kind of residential building, and both its intended and unintended consequences will be discussed by a survey of recent studies including those that explicitly considered the health and well-being of the residents.

### **THEORETICAL FRAMEWORK**

There are several reasons why an ecological perspective is pertinent for the study of high-rise housing. These reasons stem from the fact that buildings, in general, and housing, in particular, serve five sets of functions or purposes, which can be considered collectively as a model of building performance (Lawrence, 1987). These functions can be summarised as follows:

First, any building defines and delimits space to shelter human activities by demarcating a private domain from the rest of the world. In this respect, when the location of a building and its design are chosen (e.g. overlooking a nature reserve, aligning a busy road, or close to a power station) then the quality of outdoor environmental conditions surrounding the building should be considered.

Second, the building envelope will act as a filter between the interior spaces and the external surroundings. An efficient filter will sustain acoustic, illumination and thermal conditions within prescribed "ranges of human comfort". These ranges have evolved over time and they vary between cultures, and between diverse age groups in a given society. In this respect, indoor climate ought to be explicitly related to the external environmental conditions and the inherent capacity of the building's walls, floor and roof to act as an efficient filter, as well as the nature of human activities that occur around and inside the building.

Third, buildings are endowed with meanings. They are symbolic artefacts, not merely with respect to the intentions of the designer and the client, but also in terms of how the public interpret them. From this perspective, the design, the meaning and the use of housing are very different when viewed from the "bottom up" and from the "top down" (Hamdi, 1990). This means that communication between different groups of people is necessary: it may serve as the catalyst for change from imposed solutions

that are often inappropriate to processes that incorporate the experience and values of lay-people in meaningful ways.

Fourth, buildings have environmental and economic implications in terms of the initial use and cost of raw (sometimes non-renewable, polluting) materials, labour and energy, as well as the use of these sets of resources during the whole period of occupation of buildings. From this perspective, adverse indoor thermal environments, for example, should not only be dealt with by improving the thermal insulation of walls, floors and roofing, but also by assessing the affordability of diverse fuels and equipment for indoor heating and cooling in conjunction with internal human activities.

Finally, buildings have an ecological impact on the biological environment. Site coverage, building and room densities, building height and volume are aspects that influence the micro-climate. The consumption of resources and the accumulation of wastes have effects on the health and well-being of people both inside buildings and outdoors.

This multi-functional model of building performance underlines the fundamental principle that housing is a multi-dimensional set of human intentions and processes that can generate a range of built environments having both intended and unintended consequences. Housing units are not just physical shelters but also the formal means of providing security, of generating employment and household income, as well as the consumption of natural resources and the creation of diverse kinds of waste products.

### **METHODOLOGICAL PRINCIPLES**

Housing evokes a range of images and concepts commonly related to the material and physical nature of one or more kinds of dwelling units. Nonetheless, the meaning of housing, like the meaning of home, varies from person to person, between social groups and across cultures. Housing units are commonly accorded an economic value, an exchange value, an aesthetic value and a use value; whereas, in addition to these, a home is usually given a sentimental and a symbolic value. From this perspective, interpretations of housing are very different when viewed from the legislator's, the public administrator's and the resident's point of view. Trying to understand these viewpoints requires an approach that may be in conflict with arbitrarily defined solutions drawn up and applied by national governments or by international agencies. During this century, the practice of prescribing minimum standards for the quality of a wide range of environmental entities — air, water

supply, and building materials, for instance — has led to a significant improvement in site planning, building construction and housing design in both industrialised and developing countries. However, when these standards are examined in terms of their rationale and objectives, it becomes clear that they have commonly been drawn up with economic, technological and political priorities in mind, whereas the lifestyle, domestic economy, values and well-being of local populations have been largely undervalued or ignored. An integrated perspective can correct this practice, because it enables the formulation and application of an alternative approach.

However, as Turner (1976) has argued, one major hurdle to overcome in order to implement this kind of perspective concerns the perception of decision makers, legislators and public administrators, in particular. These persons not only have a limited rather than a broad intersectoral interpretation of housing and well-being, but they also perceive a healthy residential environment as one that is controlled by them. Clearly, this is not necessarily the case, as the studies of high-rise housing presented later confirm.

### **THE SOCIETAL CONTEXT OF HIGH-RISE HOUSING**

Since 1945, an increasing share of the housing stock in many countries has included multi-storey buildings. In most European countries in the 1950s, governments faced an economic, housing and urban crisis owing to a combination of factors. These factors include the negative impacts of warfare between 1938 and 1945, the economic recession and low investments in the building construction sector during the 1930s, in conjunction with a scarcity of serviced land, the large share of the building stock that was damaged, and an increased demographic birth rate. Collectively, these factors led to a demand for housing that was not adequately met by the housing stock in either quantitative or qualitative terms.

Legislation prescribed new land uses in suburban and rural areas in many countries soon after the end of the Second World War. At that time, a growing number of professional groups in many countries began to share the viewpoint that multi-storey residential buildings could alleviate the housing shortage by providing new housing units on urban and suburban sites using a minimum amount of serviced land, modern building construction methods including prefabrication and avant-garde architectural and urban planning proposals (Ravetz, 1980). It is necessary to underline that civil servants, politi-

cians, private construction companies and public sector building agencies were all partisan to this viewpoint (Bulos & Walker, 1987; Dunleavy, 1981; Prak & Priemus, 1985).

By the 1970s, the construction of high-rise residential buildings had sharply declined or ended in many Western countries. In Asian and Eastern European countries, this kind of housing continued to be built. During this decade, the shift from new building construction to repair, upgrading and reuse was significant in many western countries. This trend corresponded with the enactment of legislation concerning urban and building conservation.

Two decades after the end of constructing new high-rise residential buildings, the legacy of multi-story housing is a controversial subject. In many European cities, such as Amsterdam, London, Lyon, Manchester and Glasgow, one or more large housing estates with this kind of building have been partly or completely demolished. In other cases, substantial modifications and repair to buildings and landscaping have been completed or are in progress. These programmes of work by municipalities or private developers (who have purchased properties from public landlords) often lead to a change of the resident population even if the tenure status of the housing units is not modified. Still other estates comprising high-rise housing have become characterised by relatively high vacancy levels and neglect by housing management. Such housing has become difficult to let, largely due to social reasons, including stigmatisation, and not just economic factors (van Kempen, 1994).

There are diverse strategies that both the public and private sectors have applied in many countries which show there is no shared consensus about the values, meanings and uses attributed to this kind of residential building. Therefore, it is instructive to develop an understanding of the wide range of impacts that high-rise residential buildings have had on urban environments, the economy, human health and well-being. This paper argues that this understanding ought to be a prerequisite prior to making future decisions to demolish, upgrade or change the tenure status of this important share of the housing stock in many countries. This paper is meant to contribute to that debate, by reorienting and diversifying recent contributions on this subject. Particular attention is given to the impacts of this kind of residential building on human health and well-being.

## NEGATIVE CONSEQUENCES OF HIGH-RISE RESIDENTIAL BUILDINGS

Numerous evaluation studies have documented the consequences of multi-storey residential buildings that were constructed by either the private or the public sector. However, it is not possible to make generalisations. Today we know that for numerous reasons, it is not plausible to compare high-rise housing without a clear understanding of the numerous components involved. Therefore, even in one city, such as New York, an apartment along 5th Avenue in the district of Manhattan cannot be compared with a tenement in the Bronx unless a wide range of material and non-physical components are explicitly considered. Bearing this qualification in mind, some common problems with this kind of building are now mentioned.

First, although high-rise housing is not uniform in its technical design, construction or structural composition, common problems include concrete "rot" and rusting reinforcement, poor thermal insulation, inadequate acoustic isolation, poor cross-ventilation and condensation on windows and external walls. In addition, these problems lead to heating charges which are relatively high compared with heating costs in other kinds of buildings. All these shortcomings are strongly related to uses of diverse kinds of industrialised building construction systems in contrast to traditional load-bearing brick construction. Given that not less than 150 different industrialised systems were used in Britain between 1974 and 1979, the volume and distribution of these kinds of problems should not be underestimated, as Prak and Priemus (1985) have shown.

Second, unfavourable site locations often isolated from community services, with poor or no access to neighbourhood parks, leisure facilities, the labour market and varied commercial areas; with inadequate public transport and yet with nuisances stemming from motor traffic, industries and poor micro-climatic conditions. The range of problems in this category are acute with respect to high-rise residential buildings and housing estates that are located on the periphery of cities and towns. The isolated nature of housing units in outer suburban neighbourhoods which are poorly serviced by public transportation exacerbate the social segregation and exclusion of mono-parental households, the unemployed, the elderly and youth.

Third, problems related to inadequate building maintenance and lack of surveillance of the day-to-day use of multi-storey residential

buildings and housing estates. These shortcomings include the lack of repair of technical faults especially to lighting, lifts, plumbing and rubbish disposal. Furthermore, damage to property and landscaping has been left unattended. These problems are sometimes compounded by a deterioration of the aesthetic character of these residential areas, owing to the accumulation of graffiti, litter and animal excreta. The consequences of these problems are not limited to aesthetic or technical characteristics, because studies show that delinquency and vandalism generate a "fear of crime", insecurity, and a sense of isolation amongst many residents especially women and the elderly.

Fourth, a concentration of households that can be categorised and stigmatised owing to their ethnicity, employment status and dependency on welfare. Such concentrations stem largely from a housing allocations policy, applied by representatives of institutionalised landlords, that initially attributed high-rise housing to migrants, households with young children, and those in need of a housing allocation or subsidy. In recent years, these problems have been exacerbated by differences in rental charges and occupancy conditions for similar kinds of housing units that were constructed then renovated at different dates. These allocations policies illustrate the rigid way the housing stock is often attributed to households without consideration of their specific needs. Such practices are rarely regulated by central or local government. However, a survey in Britain in 1984 found that 170 local authorities had made various policy decisions not to let housing units on the upper floors of high-rise buildings to households with young children (Bulos & Walker, 1987).

The rise and the demise of high-rise housing is not only related to these sets of compound problems. In addition there is a growing amount of evidence which confirms that the policy of constructing high-rise housing has been counterproductive for a number of reasons, including:

- 1 Although urban renewal was justified in terms of new housing, slum dwellers were commonly rehoused in similar kinds of accommodation or high-rise flats in urban locations, or on distant housing estates.
- 2 High-rise housing is a more costly form of residential accommodation than dwelling units in buildings of less than five storeys.
- 3 From 1950, in several European countries, government housing subsidies were tied to storey height, providing a strong incentive to construct residential buildings above six storeys, so much so that during the following

- decade high-rise housing was concentrated in some dense urban neighbourhoods.
- 4 The development of high-rise housing should not be dissociated from an architectural ideology which upheld that this kind of accommodation was appropriate for a modern technological era and that it was socially responsible and just.
  - 5 The technology for building high-rise existed prior to the proliferation of this kind of housing, so that advances in construction technology cannot be interpreted as determining or strongly influencing the adoption of this building form.
  - 6 High-rise housing was predominantly built by a limited number of large (national) construction companies, rather than smaller (local) firms, and constituted a higher proportion of industrialised building techniques than other kinds of public housing.

These findings are based on research and case studies by Andrews (1979), Darke (1984), Dunleavy (1981), Francescata *et al.* (1979), Prak and Priemus (1985) and others. Collectively, they have examined the merits and limitations of high-rise housing in relation to the discourse of politicians, design professionals, members of the construction industry and a very limited number of community pressure groups. These case studies show that local debate about housing issues was rare, and that the adoption of high-rise residential buildings in different cities and regions of Europe followed national trends and housing policies rather than local democratic decision-making. Indeed, Dunleavy's (1981) research underlines that, in each of the three localities he studied, there was no systematic analysis of housing demand, no survey of the existing housing stock or land available for new development and no formal participatory framework for community involvement in decision-making. Dunleavy suggests that post-war housing policies envisaged high-rise housing as "a technological short cut to social change" faced with a shortage of dwelling units

... High-rise and mass housing solutions (were) introduced and promoted as technological short-cuts. They appeared to provide the means of cutting the gordian knot of ... conflicting social and institutional pressures confining the public housing programme in a vicious circle of solutions and problem intensification (p. 102).

It is appropriate to underline that common criticisms of this kind of housing should not be restricted to architectural and mechanistic interpretations of the design of a specific type of residential building. This principle is ably de-

bated by van Kempen (1994) who shows that there is a growing consensus that an evaluation of rented housing design should explicitly account for the means of provision and management from an integrative historical perspective. Furthermore, this review of studies of high-rise rental housing shows that if restrictive interpretations are to be replaced by contextual and multidimensional ones, then housing design, provision and tenure should be considered in a complementary way by applying an integrated perspective. This kind of approach was not applied to formulate and implement housing design and management policies for the public rented sector in many countries after 1945 and it still remains rare today.

### HIGH-RISE HOUSING, HEALTH AND WELL-BEING

There are many studies of the attitudes, behaviour and well-being of the residents and the design and use of high-rise housing (for example, Adams & Conway, 1975; Andrews, 1979; Burridge & Ormandy, 1993; Churchman & Ginsberg, 1984; Fanning, 1967; Francescata *et al.*, 1979; Gillis, 1977; Hope, 1986; Jacobs & Stevenson, 1981; Jephcott, 1971; Michelson, 1977; and Mitchell, 1971). These studies have commonly focused on the influence of specific features of the residential environment (such as floor level above the ground in residential buildings) on psychological strain (due to enforced interaction with neighbours, or isolation from them). For example, studies by Fanning (1967) and Mitchell (1971) found that physical ailments and psychological problems are related to housing type (that is, detached houses compared with flats), and that psychological strain among residents varies directly with the floor level on which the dwelling unit is located. It is noteworthy that this research was completed in different countries which have diverse housing standards and no shared domestic culture. Moreover, these studies examine only one or two components of the housing conditions of the inhabitants, whilst many other classes of interrelated factors are not studied, as Jacobs & Stevenson (1981) have underlined. Bearing in mind these limitations, this paper requests and outlines a more comprehensive approach.

### REQUIREMENTS OF SPECIFIC GROUPS

Previous studies in several countries indicate that problems associated with high-rise housing concern the welfare of young children and their opportunity for outdoor recreation (Department of Environment, 1972; Jephcott, 1971; Stephenson, Martin & O'Neill, 1967). A study by

Churchman and Ginsberg (1984) in Israel, for example, illustrates that the clearest differences between the respondents relates to their status as parents of children under six years of age. Problems related to outdoor play and fear of falling out of windows were expressed more frequently by respondents with young children. Although the authors found that nearly all children over six years of age are permitted to play outdoors unaccompanied by a parent, the nature of this liberty and its progression with age is not related to the distance above the ground on which they live, but it does have some bearing on the presence of older children in the family.

At a more general level, studies have found that the residents' satisfaction with their housing is not directly related to building height, because feelings of crowding and neighbour relations are also important. This finding suggests that the number of households per elevator — a precise design feature of this type of housing — is a variable that ought to be examined systematically in the future. Moreover, the stage in the life-cycle was an important variable: those respondents with young children who lived in high-rise apartments had a relatively strong preference for lower residential buildings and had stronger intentions to move than those respondents living in low-rise buildings. These results illustrate the relevance of a longitudinal perspective for future studies.

The differences between the generalised results of many studies of the benefits and problems of high-rise housing, and those presented by Churchman and Ginsberg are significant. A comparison of these studies reveals the pertinence of a wide range of interrelated factors that are contextually defined. Therefore, as Churchman and Ginsberg (1984: 28) note :

... One critical question which should be systematically addressed is whether the problems identified are due to the unique attributes of high-rise buildings or to attributes and factors such as self-selection, social class, stage in the life-cycle, building scale and the particular design solution, or to the interaction among some or all of these attributes ...

Moreover, "... It is important to examine whether problems (or advantages) of high-rise housing are cross-cultural, or are related to the specific physical, social and cultural context of the countries studied."

### SYNTHESIS

The studies of high-rise housing presented in this paper illustrate the need for a comprehensive approach which explores the reciprocal re-

lations between a range of physical and non-material components that define and are defined by the residential environment in which they occur. If this kind of approach is to be explicitly concerned with the interrelations between the environment, housing and human well-being, then it is necessary to identify and monitor the various costs and benefits of specific types of housing in relation to the health and well-being of various groups of residents. For example, high-rise housing is not only distinctive in terms of building height but also with respect to an increase in surface area, in general, and in relation to the depth of dwelling units between building facades with fenestration. This trend in housing construction has meant that an increasing proportion of the habitable spaces in high-rise housing is further removed from daylight and natural ventilation when compared with traditional types of housing. Furthermore, a large proportion of dwelling units constructed since 1945 in multi-storey buildings include toxic building materials (e.g. asbestos based materials, formaldehyde adhesives, lead-based paints and radon emissions). Moreover, there is inadequate acoustic insulation between dwellings in the same building, as well as between the interior and the exterior. Last, but not least, external walls commonly have inadequate thermal insulation, so that dwelling units are not only hard to heat with an economic supply of energy, but the development of condensation and dampness is encouraged owing to the lack of adequate cross-ventilation (World Health Organization, 1990).

Given this legacy of contemporary high-rise housing, is it any wonder that respiratory illnesses and allergies have become a primary cause of morbidity and mortality in several European countries? Furthermore, now (or formerly unknown) diseases such as Legionnaires' disease have been identified. Room humidifiers, air ventilation systems and cooling towers, as well as hot and cold water supply ducts, have been found to nurture legionellae bacteria and transmit them through the indoor environment, or discharge them into the immediate vicinity of the building. An ecological perspective raises some fundamental issues. We could begin by asking why the water supply has become prone to bacteria; or ask whether it is necessary to install mechanical ventilation and air conditioning systems in high-rise housing when it might be simpler to avoid constructing internal rooms that are devoid of both daylight and natural ventilation. Are there not alternative principles and practices for building construction and housing design even when high density housing is unavoidable? This paper has argued

that a reorientation of policies and practices is required.

### CONCLUSIONS

All land uses, including housing construction of diverse kinds, generate costs and benefits which ought to be identified in relation to qualitative and quantitative criteria over short and long periods of time. The studies of high-rise housing presented above indicate that the calculation and monitoring of costs and benefits related to housing, health and well-being is a fundamental, controversial task that should be assumed by communities, including their governments, rather than one or more groups of professionals. Nonetheless, environmental health officers, medical practitioners, architects and community groups can make an important contribution to the accounting and monitoring of costs and benefits.

Today, the lack of systematic feedback in architecture, urban planning and the housing sector is well known and ought to be corrected.

Alternative policies and practices for housing could be formulated and applied using the principles and policies outlined earlier. Only then can informed decisions be taken democratically, costs and benefits assigned, and negative impacts reduced. Unfortunately, the majority of housing built during this century, and especially since the Second World War, did not benefit from this kind of approach and the legacy for current and future generations is now borne by too many. The economic, ecological, health and other social impacts of housing of all kinds may be substantial, yet they are still not widely recognised or studied systematically. However, the stake is significant for both current and future generations.

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