01
Mappings

Emerging
Themes

WORKSHOPS
PEDAGOGY
LEARNING SPACES
COMMUNITY PARTICIPATION
PARTICIPATORY ACTIONS
RESEARCH
READERS
OIKOPEDIA

Belgrade
Cottbus
Lisbon
Civic Housing
Growth/Shrinkage
Habitat Regeneration Strategies
Renewing/Revitalizing
Urban Housing Regeneration
Urban Systems

Barcelona
Bratislava
Rimini
Skopje

Affordable Housing
Area-Based Interventions
Building Performance Evaluation
Capacity Building
Codesign
Community Participation
Crime Prevention
Gentrification
Healthy Cities
Housing Innovations
Housing Regeneration
Housing Rights
Participatory Design
Participatory Planning
Passive Design
Post Occupancy Evaluation
Sustainable Housing Design
Urban Regeneration
Issue 01/Chapter 01

Emerging Themes in Contemporary Housing Research

Karim Hadjri

INTRODUCTION

This chapter presents a review of emerging themes in contemporary housing research identified as part of the OIKONET research activities, namely sustainability, participation, affordable housing, and housing regeneration. This research on contemporary housing is wide ranging and also covers sub-themes such as housing design, citizens' participation, retrofitting, and urban renewal. Other relevant topics that have been examined by OIKONET partners as part of their recent research activities are related to capacity building and codesign, energy efficient building design, gentrification, housing allowances, public rental housing programmes, and to the relationship between design and research within the design studio context.

As a result of the collaborative research effort undertaken during the OIKONET project, it has been possible to identify common research topics on contemporary housing policy and practice such as those concerned with regeneration issues, namely: Brownfield regeneration, neighbourhood regeneration, regeneration of multi-family buildings, and post-conflict regeneration, some of which will be discussed in this chapter.

SUSTAINABILITY

Sustainable development was progressively developed through the *World Conservation Strategy* (1980), the *Brundtland Report* (1987), the *United Nations Conference on Environment and Development* in Rio (1992), and more recently the Paris UN *Climate Change Conference COP21* (2015). In addition, the actions of national and regional governments and the commitment of business enterprises and communities, as well as non-governmental organizations, have contributed to fostering sustainability in many areas. Public sensibility about environmental and social issues in sustainable development is on the increase nowadays as citizens and communities become aware of the benefit of their effects on their well-being and to the common good (Adams, 2006). Sustainable development embraces the main interdependent and indivisible areas of environmental protection, economic development and social development. Sustainability principles that support these three dimensions consider both local and global consequences in the short-term and the long-term, and generally present broad assessments of progress toward sustainable development (Shrivastava & Berger, 2010).

Sustainable or green building construction of housing aims to endorse the principles of sustainable development in the siting, design, building, maintenance and occupation of buildings. Over the last few decades, sustainable housing design has become increasingly important given the housing stock's impact on the environment and the concerns for the occupants' health and well-being. Norris and Carnegie (2015) list a

number of measures that can improve environmental sustainability such as using brownfields for housing; promoting mixed-use developments; fostering renovation to avoid demolition; using more sustainable building materials; favouring high densities, and preserving natural habitats and green areas.

Energy efficiency in housing is one key aspect influenced by design and cuts across several facets of society such as social, economic and environmental. Also, energy efficiency directly affects households' income and the nation's economy. Hence, having an old residential building stock represents a considerable challenge for a country. In particular, energy poverty is becoming a prominent issue in most countries with an outdated housing stock and particularly in those such as the Commonwealth of Independent States (CIS) countries (Amann, 2015) which suffer cold winters and where many homes have inadequate central heating systems. There is no doubt that the task of improving this stock's energy performance through refurbishment can be difficult and is a long-term process. In the UK, for example, the refurbishment of the housing stock is inevitable in order to meet the housing demands (Bell & Lowe, 2000). Nonetheless, refurbishment could provide an opportunity to rethink the design and energy performance of a building, which is important for the provision of contemporary housing.

Nowadays, the construction of new housing is guided by building regulations and technical housing standards which take into account sustainability. At the same time, a myriad of housing concepts emerged such as ecohousing, low and zero carbon buildings, green housing, and passive design. The passive house, for example, seeks to conserve energy, reduce the waste generation and be environmentally equitable (Feist, Schnieders, Dorer, & Haas, 2005). A passive house uses renewable energy and is more cost-efficient to maintain. However, there are concerns about the indoor air quality due to the airtightness which may cause air contamination or overheating (Hasselaar, 2008). The passive house is nonetheless an innovation which needs further development to become a widely accepted and affordable solution for sustainable housing design.

Sustainable housing design should also be responsive to demographic change and sensitive to new and emerging living arrangements, making it possible to expand or reduce a dwelling as it may be required by its current or future occupants. This is why inclusive design is an important component of a sustainable housing. Historically, inclusive design was concerned with disability and mobility. However, recent demographic trends, and more specifically an ageing population, have led to the emergence of new health issues which have an impact on the design and the arrangement of spaces in a house, such as visual and cognitive impairments. Hence policy makers, designers and architects need to consider these new user needs and requirements. Inclusive design is nowadays part of mainstream design. Across the world, sustainability policies have been targeting sustainable development

through the efficient land use planning, issuing housing policies, and fostering sustainable communities. In this context, high quality design refers to place identity and successful outdoor areas. A socially sustainable environment is desirable because it leads to good quality of life, it is safe and easy to use, is accessible and pleasant, and is well serviced (Burton, 2003).

PARTICIPATION

During the twentieth century, modern housing was expected to be user-focused, and delivered through public engagement and participation. This process took place as early as the 1920s (Scott, 2008). In post-war Europe, public participation played a key role in housing development (Glendinning, 2010). Housing stakeholders such as housing associations and agencies, governmental bodies, and architects and engineers had to harmonise changing public needs into aesthetic architectural designs not always popular (Balchin, 1996).

Community, users or citizens' participation aims at taking into account inhabitants' requirements in housing design and planning. Ultimately, the success of participatory processes depends on how effective is the collaboration between professionals, local authorities and users.

Despite the fact that the quest for participation is not new, there are still concerns about its meaning and its application. Participation can be understood as a mechanism to transfer the decision-making power from the administrators to the inhabitants, which does not necessarily imply changes to the administrative structure (Habraken, 1985). Despite the evidence of the successes in user participation, views about the validity of participatory processes to produce responsive environments or redevelop unpopular estates are still divided. In fact, some participatory processes do not always lead to user satisfaction and more efficient maintenance of buildings and public spaces (Hamdi, 1991). Key criticisms focused on the fact that these processes can be time-consuming, complicated and costly, slowing the design process and increasing the administrative work. The validity and value of user participation is still debated in many countries. The goals of participation need to be clarified and the added value should be explicit and attractive so that long-lasting partnerships can be built.

Community participation in housing design and provision is an important strategy whose interpretation and application varies greatly from one place to another. This is due primarily to the type of decision-making power stakeholders might have, and the extent to which their views are taken into account by those in charge of the planning and design process. Participation in design can sometimes be criticised for being unable to fulfil users' housing requirements (Noguchi & Hadjri, 2009).

New approaches such as citizens' empowerment have emerged in Europe recently, where inhabitants are key actors in governance processes aimed at

developing the city, and empowerment is therefore considered to be of great value in planning (Andrews, Cowell, Downe, & Martin, 2006). Empowerment will require capacity building so that actors can engage effectively with the participatory processes.

Codesign is also a powerful instrument to support participatory processes. Contemporary approaches to codesign differ slightly from earlier ones. Today, a diverse range of factors such as citizen power, aesthetics, place-making, and public space are simultaneously considered. This concept has been successfully tested within a Swedish context by colleagues at Chalmers University by intertwining research, education and community outreach (Stenberg, 2012; Stenberg & Fryk, 2012; Stenberg et al., 2012).

AFFORDABLE HOUSING

Nowadays, the supply of quality housing represents a global challenge illustrated by acute shortages and affordability issues. Problems with homelessness, overcrowding, tenure security, substandard housing, and segregation and clustering of poor quality housing are present in many countries (Hegedüs et al., 2015). In particular, overcrowding is driven by a lack of affordable housing, thus forcing many young adults to live with their parents and grandparents, sometimes in substandard housing.

The following statement provides an interesting definition of affordability: "'Affordability' is concerned with securing some given standard of housing (or different standards) at a price or a rent which does not impose, in the eyes of some third party (usually government), an unreasonable burden on household incomes" (Maclennan & Williams, 1990, p. 9). At a global level, the debate on urban resilience addresses affordability through a focus on the physical, social and economic challenges currently faced by cities (Haffner & Elsinga, 2015).

A lack of affordable housing remains a major concern worldwide due to the priority given by governments and housing providers to other dimensions of sustainability over economics. This has led UN-Habitat and the Global Network for Sustainable Housing (GNSH) to engage in the solution of this problem through a number of global initiatives.

During the last century, mass social housing not only improved affordability but also resulted in a greater citizen participation in housing design and planning (Scott, 2008). Affordability in contemporary housing is not simply a financial issue, but a more complex question of *if and how* the society at large can embed housing demands into everyday architecture. For example, in most European countries there are social housing support systems intended to facilitate low-income and/or working class households an access to a house. Some are in the form of tax breaks and subsidies to support homeownership, while others offer rent support systems through solely public or public-private partnerships. However, questions have been raised about how

far-reaching or inclusive these policies are (Amann, 2009). Affordability is usually seen through the lens of return on investment and the balancing act of realigning social justice and market forces (Turner & Elsinga, 2005).

Access to decent affordable housing is a fundamental determinant of people's welfare, and its role in strengthening social integration and social cohesion. Throughout the world, social housing—either for rental or for first-time buyers—is not always accessible or affordable, especially to low-income population and young generations. Therefore, innovative housing solutions are needed to facilitate to these population segments access to housing. For example, more innovative mortgages; non-profit tenant cooperatives; tenure-neutral measures; and improvement of the public rental sector's procedures would be helpful (Hegedüs et al., 2015). Policies for affordable housing are also needed across the globe to improve social inclusion through, for instance, linking housing quality and its costs. Adequate housing policies will be required to tackle affordability issues and drive housing innovation for both the public and private sectors (Haffner & Elsinga, 2015).

In Europe, some social innovation programmes aim to facilitate access to housing to young households (Bežovan, 2012). Nonetheless, there are still challenges with regard to a polarized tenure structure, lack of investment in social housing, inefficient subsidies, and growing affordability limitations which need to be faced (Tsenkova, 2003).

HOUSING REGENERATION

Urban regeneration is informed and driven by the causes and effects of globalisation, climate change, economic crises, and lifestyle changes. In Europe, there is currently a pressing demand to redevelop brown-fields areas, historical centres, areas affected by conflicts and disasters, and large social housing estates. Housing regeneration ranges from large-scale at the level of a neighbourhood to micro-scale interventions at the building level.

The regeneration of brownfields for housing development is not always desirable or feasible because often this type of land is contaminated. Brownfield regeneration has increased as a redevelopment option for housing development programmes. In the UK, for example, the government encourages reusing this type of land over greenfields through a number of mechanisms and incentives. Regeneration in the UK has become a major element of urban policy, particularly since the 1990s. The objective was to make these redeveloped areas "more attractive places in which to live and work" (Department of the Environment, 1994, p. 158). Today, the redevelopment of brownfield sites is a fundamental part of many housing programmes which provide the technical and financial support required to regenerate them.

Urban regeneration has historically focused on social and economic improvement. However, over the last two decades, following the renovated quest for sustainable communities, more emphasis has been placed on the three pillars of sustainable development namely, environmental, social and economic. Nowadays, urban regeneration programmes for deprived areas are aimed at improving the physical, environmental, social and economic conditions which are necessary to achieve sustainable communities (McDonald, Malys, & Maliene, 2009). This does not mean that an urban regeneration leads necessarily to a more sustainable community. Further research is required to identify the challenges facing the creation of sustainable communities and the type of built environments needed for their development.

Similarly, most Mediterranean cities are experiencing spatial, social and economic deprivation due to suburbanisation, political crises, poor infrastructure and lack of resources. Poor housing supply, physical degradation, concentration of ethnic minorities, unemployment and loss of economic activities are often problems faced by cities like Nicosia. Post-conflict regeneration programmes in Cyprus faced a number of challenging issues. For example, the area of Chrysaliniotissa has a low proportion of owner-residents, low-income population, lack of economically active inhabitants, shortage of community facilities, and high rate of older residents. The renovation projects of this area aim at bringing the original residents back, attracting young couples with children, and establishing new economic activities. Results show that a growing number of people want to buy or rent in this area, and property values have started to rise (Charalambous, 2015).

Budapest is also experiencing significant challenges with urban renewal. The rapid decrease of the population led the city council to renovate the housing in the inner city, including old derelict buildings, and to allow the creation of gated communities (Csanádi, Csizmady, & Olt, 2010, 2011).

With regard to retrofitting strategies, refurbishing of multi-family buildings can benefit from large-scale local community driven activities, including awareness campaigns and the promotion of best practices. Arkar, Domjan and Medved (2013) examined large-scale retrofitting of multi-family buildings in the local community of Zagorje ob Savi in Slovenia. The works included facade thermal insulation, window replacement and thermal insulation of constructions for unheated basements and attics as well as the installation of heat-cost allocators, thermostatic valves and energy-efficient lighting. Lessons learnt from this case revealed that, energy used for heating decreased on average by 47%. Users' feedback proved that retrofitting has a large influence on the living comfort in the indoor environment (thermal comfort, indoor air quality, lighting comfort and noise protection). From the results, it can be concluded that building retrofitting decreases energy consumption for heating substantially and improves indoor living comfort.

Successful retrofitting of housing can benefit from local community driven activities, including awareness campaigns and lessons from best practice. Likewise, access to decent affordable housing has an important role in strengthening social cohesion, and has become a fundamental determinant of people's welfare. The quality of housing needs to be improved to afford residents a healthy living environment. Similarly, tenure security and inclusivity in housing provision should be considered particularly when substandard housing is being renovated.

Empowering local residents and stakeholders to become active participants in the renovation is also a desirable outcome of a regeneration programme. Funding agencies are aware that actors should provide appropriate mechanisms to facilitate participation of citizens from the early planning stages to the operation and use. It is expected that the active engagement of citizens will foster social cohesion and will help to bring together different groups in an urban and housing regeneration project which meets the needs of local communities.

Societal changes across the world have sometimes neglected the dialogue with citizens. This is particularly the case in complex urban and spatial planning processes. Authorities and experts need to develop strategies and learning process that facilitate stakeholders involved to understand the key problems facing an urban regeneration programme, and to help them develop appropriate solutions.

Finally, mass housing in Europe built after the 1960s and 1970s has required significant refurbishment due to poorly maintained buildings with substandard energy performance. In addition, residents of these estates are sometimes socially excluded and belong to the disadvantaged segments of the population. The involvement of residents in decision-making is highly recommended in housing regeneration as it enables them to strengthen their links with the community.

CONCLUSIONS

This brief review of contemporary housing research has been collected following the work carried out by the OIKONET network. The themes that have been identified namely sustainability, participation, affordable housing, and housing regeneration are strongly interconnected. These have informed and guided the network's research, pedagogic and participatory activities.

Sustainability—in its three dimensions, environmental, social and economic—plays a major role in contemporary housing, at the global and local scales. Energy efficiency of buildings has become a driving force for housing development particularly in relation to retrofitting given the large amount of the old housing stock, particularly in Europe. The world is also experiencing significant demographic changes such as an ageing

population and the demands of multigenerational living, which needs to be taken into account when designing new housing. Many governments are also encouraging the creation of sustainable communities through the promotion of sustainable green living, healthy indoor and outdoor environments, and accessible and pleasant neighbourhoods. Sustainable contemporary housing should take into account its location, respond to climate, use locally available sustainable materials, be of high quality in terms of design and building, be socially inclusive, be affordable and, ultimately, lead to the creation of sustainable communities.

Sustainability of housing environments can also be enhanced through effective collaboration between designers, housing providers and users. From the perspective of the design and planning of energy efficient buildings, it is also important the involvement and participation of various stakeholders and the engagement of community representatives, social organisations and citizens. Users' requirements should form an integral part of participatory processes aimed at housing design and planning, and the creation of sustainable communities. The latter calls for more community participation in housing design and provision as a required long-term strategy.

Affordable housing is a significant global challenge as acknowledged by the un-Habitat and the Global Network for Sustainable Housing. Challenging problems linked to affordability are homelessness, overcrowding, and tenure insecurity. Affordable housing solutions should be reinforced to improve social inclusion. This is another important challenge that can be improved by linking housing quality and its cost. Affordability issues should be addressed through effective housing policies and the engagement of both the public and private sectors through innovative housing mechanisms.

Urban regeneration is one of the key factors driving housing supply in many countries, particularly in Europe given the ageing housing stock. It contributes to improve social and economic environments of target areas that had been derelict or have become brownfields. Regeneration in these areas is aimed at achieving sustainable communities through an improvement of the physical, environmental, social and economic conditions. Despite significant efforts by many local authorities and governments to tackle physical degradation, concentration of ethnic minorities, unemployment and loss of economic activities through regeneration programmes, more needs to be done in order to improve the physical environment and the economy, provide affordable housing, and nurture sustainable communities. Further research is needed to establish the effects of contemporary urban renewal; to review housing regeneration strategies on communities; to identify the challenges regarding the creation of sustainable communities and to determine the type of physical environments needed for their development. This is on the belief that housing regeneration can contribute to improve the physical,

social, environmental and economic conditions of neighbourhoods and
communities, promote community participation, and provide affordable
housing to all.

References

Adams, W. M. (2006). *The future of sustainability: Re-thinking environment and development in the twenty-first century* (IUCN Renowned Thinkers Meeting Report). Retrieved from cmsdata.iucn.org/downloads/iucn_future_of_ sustainability.pdf

Amann, W. (2009). New policies to facilitate affordable housing in Central and Eastern Europe. *Housing Finance International, 24*, 24–33.

Amann, W. (2015). Housing review of 15 countries in Europe and Central Asia. In J. Hegedüs, V. Horváth, M. Elsinga, M. Haffner, M. Norris, A. Carnegie, C. Droste, & W. Amann (Eds.), *Housing review 2015: Affordability, livability, sustainability* (pp. 77–133). Bratislava, Slovakia: Habitat for Humanity Europe, Middle East and Africa. Retrieved from habitat.org/sites/default/files/housing_ review_2015_full_report_final_small_reduced.pdf

Andrews, R., Cowell, R., Downe, J., & Martin, S. (2006). *Promoting effective citizenship and community empowerment: A guide for local authorities on enhancing capacity for public participation*. London: Office of the Deputy Prime Minister.

Arkar, C., Domjan, S., & Medved, S. (2013). *Analysis of the effects of energy retrofitting of REMINING-LOWEX multifamily buildings*. Ljubljana: Faculty of Mechanical Engineering, Laboratory for Sustainable Technologies in Buildings.

Balchin, P.N. (1996). *Housing policy in Europe*. London: Psychology Press.

Bell, M., & Lowe, R. (2000). Energy efficient modernisation of housing: A UK case study. *Energy and Buildings, 32*, 267–280.

Bežovan, G. (2012). *Procjena stambenih potreba u Hrvatskoj* [Housing needs assessment in Croatia]. Zagreb: CERANEO.

Burton, E. (2003). Housing for an urban renaissance: Implications for social equity. *Housing Studies, 18*(4), 537–562.

Charalambous, N. (2015). Post-conflict regeneration in the historic centre of Nicosia: Global challenges and local initiatives. In K. Hadjri (Ed.), *Readings on contemporary housing research: Issue No. 2* (pp. 13–21). Retrieved from oikonet.wordpress.com/2016/01/18/reader2/

Csanádi, G., Csizmady, A., & Olt, G. (2010). Recent trends of the urban renewal in Budapest. *Urbani Izziv 21*(1), 42–50.

Csanádi, G., Csizmady, A., & Olt, G. (2011). Urban renewal and gentrification in Budapest city center. In V. Szirmai (Ed.), *Urban sprawl in Europe: Similarities or differences?* (pp. 209–252). Budapest: Aula Kiadó.

Department of the Environment. (1994). *Sustainable development: The UK strategy*. London: HMSO.

Feist, W., Schnieders, J., Dorer, V., & Haas, A. (2005). Re-inventing air heating: Convenient and comfortable within the frame of the Passive House concept. *Energy and Buildings, 37*, 1186–1203.

Glendinning, M. (2010). Multifaceted monolith: The hidden diversity of mass housing. *Social Analysis, 54*, 47–59.

Habraken, N. J. (1985). Who is participating? Towards a new professional role. In M. R. Beheshti (Ed.), *Design coalition team*. *Proceedings of the International Design Participation Conference* (Vol. 1, pp. 1–10). Eindhoven: Technische Universiteit Eindhoven. Retrieved from pure.tue.nl/ws/files/4422728/196244-1.pdf

Haffner, M. E. A., & Elsinga, M. J. (2015). Affordability. In J. Hegedüs, V. Horváth, M. Elsinga, M. Haffner, M. Norris, A. Carnegie, C. Droste, & W. Amann (Eds.), *Housing Review 2015: Affordability, livability, sustainability* (pp. 29–41). Bratislava, Slovakia: Habitat for Humanity Europe, Middle East and Africa.

Hamdi, N. (1991). *Housing without houses: Participation, flexibility, enablement*. New York, NY: Van Nostrand Reinhold.

Hasselaar, E. (2008). Health risk associated with passive houses: An exploration. In P. Strom-Tejsen (Ed.), *Proceedings of the International Conference on Indoor Air Quality and Climate* (pp. 2708–2715). Copenhagen: Technical University of Denmark.

Hegedüs, J., Horváth, V., Elsinga, M., Haffner, M., Norris, M., Carnegie, A., Droste, C., & Amann, W. (2015). *Housing review 2015: Affordability, livability, sustainability*. Bratislava, Slovakia: Habitat for Humanity Europe, Middle East and Africa.

Maclennan, D., & Williams R. (1990). *Affordable housing in Britain and the United States*. York: Joseph Rowntree.

McDonald, S., Malys, N., & Maliene, V. (2009). Urban regeneration for sustainable communities: A case study. *Ukio Technologinis ir Ekonominis Vystymas, 15*(1), 49–59.

Noguchi, M., & Hadjri, K. (2009). Mass custom design for sustainable housing development. In M. Tseng & F. Piller (Eds.), *Advances in mass customization and personalization, Vol. 2* (pp. 892–910). London: World Scientific.

Norris, M., & Carnegie, A. (2015). Sustainability. In J. Hegedüs, V. Horváth, M. Elsinga, M. Haffner, M. Norris, A. Carnegie, C. Droste, & W. Amann (Eds.), *Housing review 2015: Affordability, livability, sustainability* (pp. 43–55). Bratislava, Slovakia: Habitat for Humanity Europe, Middle East and Africa.

Scott, P. (2008). Marketing mass home ownership and the creation of the modern working-class consumer in inter-war Britain. *Business History, 50*, 4–25.

Shrivastava, P., & Berger, S. (2010). Sustainability principles: A review and directions. *Organization Management Journal, 7*, 246–261.

Stenberg, J. (2012). The strength of codesign: Citizens as community builders. In T. Ooms & J. Verbeke (Eds.), *Design, participation, sustainability, ICT: Sustainable public open spaces and participation through interaction and ICT.* (pp. 78–93). Ghent, Belgium: ASPIS. Retrieved from publications.lib.chalmers.se/records/fulltext/local_166381.pdf

Stenberg, J., & Fryk L. (2012). Urban Empowerment through Community Outreach in Teaching and Design. *Elsevier Procedia—Social and Behavioural Sciences, 46*, 3284–3289.

Stenberg, J., Fryk L., Bolin E., Borg P., Castell P., Evenås U., & Larberg V. (2012). *Urban empowerment: Cultures of participation and learning*. Gothenburg: Mistra Urban Futures. Retrieved from www.urbanempower.se; publications.lib.chalmers.se/publication/175736.

Tsenkova, S. (2003). Housing policy matters: The reform path in Central and Eastern Europe. In S. Lowe & S. Tsenkova (Eds.), *Housing Change in East and Central Europe-Integration or Fragmentation* (pp. 193–204). Aldershot: Ashgate.

Turner, B., & Elsinga, M. (2005). Housing allowances: Finding a balance between social justice and market incentives. *European Journal of Housing Policy, 5*, 103–109.

Affordable Housing

GREGOR HERDA

Affordable housing can be broadly defined as housing that is "adequate in quality and location and does not cost so much that it prohibits occupants from meeting other basic living costs or threatens their enjoyment of basic human rights" (UN-Habitat, 2011a). Affordable housing covers the provision of both private and public housing.

As a generally accepted guideline for housing affordability, many countries have determined that housing costs should not exceed 30% of a household's gross income (Tilly, 2006). It is necessary to highlight that housing costs include several expenses beyond the purchase price of a house or monthly rent, such as the ongoing costs of utilities and maintenance (UN-Habitat, 2011a). The location of affordable housing and associated costs related to mobility also directly affect people's capacity to cover other living costs.

Societal trends such as accelerating urbanisation have reduced the availability of affordable housing worldwide. Rapid urbanisation places a growing demand on access to land, thus resulting in high land prices in many urban areas. For example, in African countries, high land prices, difficulties to access housing credits, and unsupportive financial terms directly result in a lack of affordable housing options (UN-Habitat, 2011a). Lack of affordable and accessible housing creates numerous socio-economic problems, such as inadequate housing conditions, the emergence and expansion of slum and informal settlement areas, homelessness and unsustainable commuting patterns.

Access to adequate housing is considered a basic human right under international law. Affordability is mentioned as one of the core dimensions of adequate housing within the *Universal Declaration of Human Rights* (United Nations, 2009). Moreover, ensuring universal access to adequate as well as affordable housing by 2030 was recently reinforced

in *Sustainable Development Goal (SDG) Number 11, Target 11.1* (United Nations General Assembly, 2015). In addition to being a legal right of all individuals, access to affordable housing can also enable various positive societal contributions. Whereas, affordable housing is often seen primarily as a social welfare instrument (Tibaijuka, 2013), it should also be considered as a productive asset that can make an important contribution to national economic development (UN-Habitat, 2012).

Affordable housing measures can address affordability either as an income problem (demand-side) or a problem related to the production of housing (supply-side) (Bredenoord, Van Lindert, & Smets, 2014). Local housing markets should be regulated to ensure different housing options, tenure choices, and that a sufficient number of units are available to different income levels. Some practical strategies to improve affordability include: Reducing housing construction costs, providing subsidies to both producers and consumers of housing (Bredenoord et al., 2014) and facilitating more inclusive housing finance options. It would also be worth exploring the synergies between affordable and green housing solutions, such as the use of more affordable local materials and labour as well as green housing principles and systems, such as renewable energy and waste water recycling, to reduce operating costs (UN-Habitat, 2012).

Brazil's Affordable Housing Programme: Minha Casa Minha Vida

Minha Casa Minha Vida (MCMV) is an affordable housing programme that was launched by the Brazilian government in 2009 as one of the packages of Brazil's *Growth Acceleration* programme. The objective of the programme is to scale up housing production and to have a positive impact on the national economy and job creation. The programme aims to build homes for 3 million low-income households in just five years by providing incentives for housing developers, provided they offer new homes at a government-approved cap price. Households are eligible to receive a flexible allowance to buy these homes if their income is under the national minimum wage. A further aim of MCMV is to make affordable housing a part of the environmental programmes (UN-Habitat, 2012; UN-Habitat, 2013).

MCMV housing units and community facility in Rio de Janeiro. Source: Fernanda Lonardoni (UN-Habitat)

Condominium Housing in Ethiopia: The Integrated Housing Development Programme

The Integrated Housing Development Programme (IHDP) is a government-led and financed housing provision programme that has been implemented in Ethiopia since 2005. The programme aims to address the current housing deficit, the poor quality of the existing housing stock, and in particular, targets low and middle-income households. With its initial goal to construct a total of 400,000 condominium units, the ambitious scale of the IHDP represents another example of a shift in government policy towards a more active role in the provision of low-income housing. In addition to constructing the housing units, the programme has facilitated access to credit for the low-income section of the population. During the first five years of the programme, a total of 171,000 housing units were built (UN-Habitat, 2011b).

The pilot project for the *Condominium Housing* programme built in Bole Gerji, Addis Ababa. Source: Katherine Hegab (UN-Habitat)

RELATED CASES

Affordable Apartment Block
Seán Harrington Architects

In 2000, Dublin City Council (DCC) ran an open international competition for an affordable apartment block that was meant to explore economical methods of construction, represent sustainable building design and be energy efficient in use. Seán Harrington Architects[1] won this competition. The scheme encountered delays and the procurement system was later changed to a public-private partnership where by a private developer/contractor constructed the block in 2008–2009, sold half of the apartments on the open market and returned the other half to the DCC for use as affordable rental housing. For a general overview of the challenges and achievements of affordable housing provision in the Irish context, please refer to McGauran and O'Connell (2014).

––––––––––––

1. See www.sha.ie

Apartments at Holles Street for Dublin City Council. Source: Seán Harrington Architects

References

Bredenoord, J., Van Lindert, P., & Smets, P. (2014). *Affordable housing in the urban global south: Seeking sustainable solutions*. Routledge.

McGauran, A. M., & O'Connell, L. (2014). *Review of Irish social and affordable housing provision, National Economic and Social Council* (NESC Secretariat Papers No. 10). Retrieved from files.nesc.ie/ nesc_secretariat_papers/No_10_Review_of_Irish_Social_and_ Affordable_Housing_Provision.pdf

Tibaijuka, A. (2013). *Building prosperity: Housing and economic development*. Routledge.

Tilly, C. (2006). The economic environment of housing: Income inequality and insecurity. In R. G. Bratt, M. E. Stone, & C. W. Hartman (Eds.), *A right to housing: Foundation for a new social agenda* (pp. 20–36). Temple University Press.

UN-Habitat. (2013). *Scaling-up affordable housing supply in Brazil: The "My House My Life" Programme*. Retrieved from unhabitat.org/ scaling-up-affordable-housing-supply-in-brazil/

UN-Habitat. (2012). *Sustainable housing for sustainable cities: A policy framework for developing countries*. Retrieved from unhabitat. org/books/sustainable-housing-for-sustainable-cities-a-policy-framework-for-developing-cities/

UN-Habitat. (2011a). *Affordable land and housing in Africa: Volume 3*. Retrieved from unhabitat.org/books/affordable-land-and-housing-in-africa/

UN-Habitat. (2011b). *Condominium housing in Ethiopia: The Integrated Housing Development Programme*. Retrieved from iut.nu/Facts%20 and%20figures/Africa/Ethiopia_CondominiumHousingUN-Habitat2011.pdf

United Nations. (2009). *The right to adequate housing* (Fact Sheet No. 21, Rev. 1). Retrieved from ohchr.org/Documents/Publications/ FS21_rev_1_Housing_en.pdf

United Nations General Assembly. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development.* Retrieved from un.org/pga/wp-content/uploads/sites/3/2015/08/120815_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf

Building
Performance
Evaluation

PEDAGOGY

COMMUNITY PARTICIPATION

RESEARCH

WORKSHOPS

LEARNING SPACES

PARTICIPATORY ACTIONS

OIKOPEDIA

READERS

Habitat Regeneration Strategies

Urban Housing Regeneration

Barcelona

Skopje

Issue 02/Chapter 10

Issue 02/Chapter 05

Issue 01/Chapter 03

Urban Regeneration

Sustainable Housing Design

Post Occupancy Evaluation

Building
Performance
Evaluation

GREGOR HERDA

Building performance evaluation—which originated from the aspirations of policy makers, building physicians, energy experts and sustainably-minded building professionals—, has witnessed a shift towards a more sustainable built environment within the complex, multi-stakeholder system, which is the contemporary building industry (UN-Habitat, 2017). The purpose of building performance evaluation is to provide information for sustainability-conscious decision-making which affects the performance of a building during the different phases of its life-cycle. This is done through the determination of quantifiable and sometimes qualitative indicators that cover expected environmental, economic and/or socio-cultural impacts. The identification and the analytical process of the relevant indicators is then converted into a sustainability rating or score that indicates how well the building in question performs in the different dimensions of sustainability (Bragança, Mateus, & Koukkari, 2010). Building performance evaluation and benchmarking serve to aid the design of successful sustainable building projects and to help to evaluate the performance of existing buildings.

Over the last two decades, building performance evaluation has led to various building assessment and benchmarking schemes in both voluntary and mandatory form. The evaluation methodology has been customised by different developers to suit a diversity of global contexts based on their priorities and specificities. The resulting schemes cover different phases of a building's life-cycle and take different sustainability issues into account. Some are global, national and, in some cases, local in terms of their focus and applicability (Haapio & Viitaniemi, 2008). Some of the more well-known commercial schemes include LEED, HQE and BREEAM. Open source initiatives like SBtool, SBAT or the

Common Carbon Metric and harmonisation measures like the European CEN/TC350 should also be mentioned.

The benefits of building performance evaluation have been proven substantial, and there is much global interest in developing the methodology further. It has been argued that well-established assessment methods are capable of transforming generic sustainability goals into specific performance targets (Bragança et al., 2010), facilitating a recognisable environmental structure (Cole, 2005) and helping to raise awareness regarding sustainable urban development (Guy & Kibert, 1998). However, a number of caveats still exist on how accurately the different building assessment and benchmarking schemes can reflect the true sustainability of a building, and whether it is beneficial to even evaluate individual buildings without acknowledging their role as part of the larger urban context (Conte & Monno, 2012). Continuous efforts are therefore being undertaken to refine these approaches and create more integrated evaluation schemes.

QSAND (Quantifying Sustainability in the Aftermath of Natural Disasters)

The International Federation of Red Cross and Red Crescent Societies (IFRC) is a humanitarian network which provides, inter alia, humanitarian shelter solutions in the aftermath of disasters, which are not only intended to save lives but which also set the path for sustainable reconstruction. IFRC's tool QSAND (Quantifying Sustainability in the Aftermath of Natural Disasters) is a free to use self-assessment tool to promote and inform sustainable approaches to relief, recovery and reconstruction after a natural disaster. As a part of its commitment to sustainable development, the IFRC, in partnership with the BRE Charitable Trust commissioned BRE Global Limited (2014) to develop the QSAND tool. Development of QSAND drew on the features of the BRE's BREEAM standard.

The structure of the QSAND tool is organised into categories within which issues relating to the reconstruction of a sustainable community are assessed. These categories are shelter and community, settlement, material and waste, energy, water and sanitation, natural environment, communications, and finally transversal issues such as resilience and participation.

The PAT is the precursor to the CAT and can be used in conjunction with or independently of it

QSAND

PAT .... **CAT** — Sustainable Outcome(s) — CAT Score

PRE-ASSESSMENT TOOL
Provides basic guidance and prompts considerations of decisions which can affect the short or long term sustainability of the community/ settlement at the early relief/recovery phase

CORE-ASSESSMENT TOOL
More detailed guidance/criteria relating to the sustainability of the community/settlement represented through an evaluation matrix covering key sustainability impacts. Applicable from the recovery/reconstruction phase

An indicative representation of the level of the sustainability of the settlement assessed

QSAND, self-assessment tool. Source: BRE Global Limited (2014)

References

Bragança, L., Mateus, R., & Koukkari, H. (2010). Building sustainability assessment. *Sustainability*, *2*, 2010–2023. Retrieved from mdpi. com/2071-1050/2/7/2010/pdf

BRE Global Limited (2014). [QSAND Brochure]. Retrieved from qsand. org/wp-content/uploads/2015/10/QSAND-Brochure.pdf

Cole, R. J. (2005). Building environmental assessment methods: Redefining intentions and roles. *Building Research and Information 35*(5), 455–467.

Conte, E., & Monno, V. (2012). Beyond the building centric approach: A vision for an integrated evaluation of sustainable buildings. *Environmental Impact Assessment Review 34*, 31–40.

Guy, B., & Kibert, C. J. (1998). Developing indicators of sustainability: US experience. *Building Research and Innovation 26*(1), 39–45.

Haapio, A., & Viitaniemi, P. (2008). A critical review of building environmental assessment tools. *Environmental Impact Assessment Review 28*, 469–482.

Santhanam, E., Martin, K., Goody, A., & Hicks, O. (2001, February). *Bottom-up steps towards closing the loop in feedback on teaching: A CUTSD project*. Paper presented at Teaching and Learning Forum—Expanding horizons in teaching and learning, Perth, Australia.

UN-Habitat. (2017). *Building Sustainability Assessment and Benchmarking: An Introduction*. Nairobi: United Nations Office at Nairobi.

Community
Participation

WORKSHOPS

LEARNING SPACES

PEDAGOGY

PARTICIPATORY ACTIONS

COMMUNITY PARTICIPATION

RESEARCH

OIKOPEDIA

READERS

Lisbon

Civic Housing

Renewing/Revitalizing

Urban Housing Regeneration

Urban Systems

Barcelona
Bratislava
Rimini
Skopje

Capacity Building

Codesign

Interplace

Participatory Design

Participatory Planning

Issue 01/Chapter 02

Issue 02/Chapter 06

Issue 02/Chapter 08

Issue 02/Chapter 09

Community
Participation

GREGOR HERDA

As Arnstein noted a near half-century ago, the term *community* or *citizen participation* has been open to various interpretations as well as a degree of misuse. In its most ideal incarnation:

> It is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future. (...) it is the means by which they can induce significant social reform which enables them to share in the benefits of the affluent society.
> (Arnstein, 1969, p. 216)

Community participation in housing delivery, as in any other context, runs the risk of becoming an empty ritual, which allows the power-holders to claim that all sides have been considered, without any real redistribution of power. In this regard, Cooke and Kothari (2001) have argued that participatory processes are just marketing tools for "outsiders" to legitimise interventions. Opposing this view, Hickey and Mohan (2004, p. 3) considered participation to be a "legitimate and genuinely transformative approach to development".

Community participation is crucial for the creation of socially and culturally appropriate housing which reflects the needs and preferences of the community. By consulting and involving residents, the needs, opportunities and threats affecting the community emerge. For instance, use of local construction techniques, cultural traditions to be preserved, group discrimination, security risks and disaster mitigation and prevention, all of which could be considered in the design process. Community participation can create a sense of ownership, which in turn can increase subsequent prospects for the adequate maintenance of the housing stock.

In certain contexts, especially in developing countries, training community members in sustainable construction techniques can help them to acquire marketable skills which in turn leads to an increase in social capital and to improvements in local economic development. Local carpenters and masons can assist in community training as well as in the supervision of construction activities. In addition, community members can assist in assessing the safety of building materials as well as their storage and distribution. In post-crisis contexts, early intervention recovery is the right time to initiate participatory processes to guide reconstruction and provide durable and sustainable housing solutions.

Consultations and Information-Sharing

Information sharing is the first step of participation and should be facilitated by project staff or through appropriate channels such as community-based organisations or municipal resource centres, with information flowing in both directions.

There are different methodologies for field consultations such as street and household surveys, focus group discussions, in-depth interviews or workshops related to specific themes, which can suit different target groups.

Meeting stakeholders at Pamoja Trust, Nairobi, Kenya. Source: Frediani, French, and Ferrera (2011)

Participatory Design and Planning Workshops

Participatory design and planning workshops should preferably be conducted in small groups of 10–20 participants and make use of visual material as well as physical models of housing proposals that non-professionals can easily understand. The results of workshops should be clearly analysed to guide the design and implementation process.

It is important to engage community leaders such as elders as early as possible in the participatory process. Furthermore, measures should be taken to ensure that all the social, cultural and economic groups, especially those which are considered vulnerable due to age or gender, are included in the process. These consultations are especially important during the design and planning phase, but can in fact add value during all project stages to respond to emerging views and new circumstances.

Public consultation in Mathare 3A, Nairobi, Kenya. Source: Gregor Herda (UN-Habitat, 2014)

Change by Design Project in Mashimoni, Nairobi, Kenya

The *Change by Design* project was co-facilitated by Architecture Sans Frontières (ASF), Pamoja Trust and UN-Habitat Housing Policy section in Nairobi, Kenya in June–July 2011. The overall objective of the *Change by Design* methodology is to improve current slum upgrading practice by investigating the opportunities of design and community participation in unlocking the hidden resourcefulness within informal settlements.

The chosen case settlement of this project in Kenya was Mashimoni, a village in the Mathare Valley located to the north of the Nairobi Central Business District. The lessons learned from Mashimoni are intended to provide insight into practices that could be transferred to other slum upgrading projects globally.

The methodology used during the *Change by Design* project was developed previously by the ASF in Brazil. The integrated methodology of the project seeks to explore slum upgrading by undertaking analysis and developing solutions at a range of urban scales: The institutional, regulatory scale; the neighbourhood, community scale; and the household dwelling scale. The project thus consisted of workshops where stakeholders and participants discussed the proposals at different scales and later compiled their findings into a matrix called "portfolio of options". The specific objectives of *Change by Design* in

Kenya were to pilot the participatory design methodology created by ASF, as well as to raise awareness on slum proliferation and participation at a broader level. The project itself did not include the physical implementation of upgrading measures in Mashimoni, but was meant to support the Pamoja Trust in their quest to develop a feasible settlement upgrading plan for the area to be implemented in subsequent stages (Frediani, French, & Ferrera, 2011).

Public consultation in Mathare 3A, Nairobi, Kenya. Source: Gregor Herda (UN-Habitat)

References

Arnstein, S. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35*(4), 216–224.

Cooke, B., & Kothari, U. (2001). *Participation: The new tyranny?* London, New York, NY: Zed Books.

Frediani, A., French, M., & Ferrera, I. (2011). *Change by design: Building communities through participatory design*. New Zealand: Urban Culture Press.

Hickey, S., & Mohan, G. (2004). *Participation—From tyranny to transformation*. London & New York, NY: Zed Books.

Gentrification

WORKSHOPS

LEARNING SPACES

PEDAGOGY

PARTICIPATORY ACTIONS

COMMUNITY PARTICIPATION

READERS

RESEARCH

OIKOPEDIA

Belgrade
Lisbon
Civic Housing
Growth/Shrinkage
Habitat Regeneration Strategies

Urban Housing Regeneration

Barcelona
Rimini

Area-Based Interventions

Hedonic Prices
Housing Regeneration
Housing Rights

Urban Regeneration

Issue 01/Chapter 04
Issue 01/Chapter 05

Issue 02/Chapter 04
Issue 02/Chapter 06
Issue 02/Chapter 10

Gentrification

GÁBOR CSANÁDI, ADRIENNE CSIZMADY

The term *gentrification* was first used in 1964 by Ruth Glass to describe the process of occupation of the working class inner city districts by the middle class (Glass, 1964). New residents bought the dwellings or even whole buildings of working class tenants as their contracts run out (Atkinson & Bridge, 2005). The process affected whole neighbourhoods of London, changing the social character of the city.

Gentrification conveys social, physical and economical transformations. A combination of changes in the population composition, the condition of the housing stock and the local real estate market makes gentrification an identifiable process. In general we can describe the process broadly as a change in land use, when higher status groups start to use the land instead of the former lower status users. In gentrifying areas land and property prices can increase due to the market and/or to the state interventions. As a result of these changes rents can become unaffordable for the former users or they can be displaced directly by planning measures.

The most widely used economic explanation of gentrification is the rent gap (Smith, 1979). Because the built environment and the given land use become obsolete after a while, if there are more profitable uses of a plot than the current ones, then the potential value of a property can increase and investors may see the chance of profit, so new investment and consequent displacement can start. However, the universal nature of rent gap explanation is questioned in less developed property markets and by the various forms of city development.

It is important to note that planning authorities, city municipalities or national governments can induce gentrification by spatial interventions and public investments that increase the (potential) real estate rents and prices and/or

change the complete function of the given area. Investors are often actively lobbying for these interventions. The changes are often welcome by governments striving for economic growth but the results can be also housing crises, increased commuting, overcrowding, displacement and homelessness.

Alternative explanations of gentrification also highlight the role of demand side effects (Ley, 1980) and the change of structure of production towards services, often concentrated in the inner cities. In many contexts the displacement is the result of state-led modernisation rather than driven by the land market. The dilemma for contemporary cities is to fund the refurbishment and maintenance of their housing stock and to attract investment and commercial activities, while keeping housing affordable.

RELATED CASES

From Working Class District to High-Tech University: Bicocca District, Milan, Italy

In the Bicocca District in Milan, Italy, a regeneration process was driven by investment considerations (Yasar et al., 2007). The Pirelli company, which was in financial crisis in the 1980s, offered its terrains to the local planning authorities to create a new cultural centre and a university on the former industrial area. The demand for new uses of spaces in the neighbourhood increased the rents in the former working class area. As a result, the mostly market based rental market witnessed enormous rent increases. This project raises some questions regarding its long-term sustainability and about the social consequences of the cooperation between private and public forces.

New housing in Bicocca District.
Source: Gábor Csanádi

Regeneration Projects in Budapest, Hungary

A different type of gentrification can be observed in some European cities where local municipalities are competing with each other to attract the interest of private developers. In Budapest, for example, local municipalities do not have the resources to refurbish the derelict areas and private investment does not arrive spontaneously to them. Local authorities try to change the potential land use of these neighbourhoods to make them attractive to investors. For example, by terminating the social housing policies in order to get rid of the low status residents with the ultimate goal of changing the stigmatised image of deprived neighbourhoods, or by giving permissions to build shopping malls instead of residential areas.

Magdolna redevelopment project in Budapest. Source: Gábor Csanádi

RELATED CASES

Gentrification by Global Investment in Istanbul, Turkey

Another example of gentrification can be found in Istanbul, where large-scale interventions are displacing residents and substantially changing the urban landscape. In this case the state is acting as a key actor, as legislator and as a policy maker. By changing the legal frameworks, the former—partly illegal—poor areas are substituted by new high-rises built partly by foreign investors. These interventions increase the potential land value as well as the rents causing further displacement. As a result of the illiberal political programmes, the central state becomes an active player in the struggle for city space and it has a decisive role in city politics. The problem is that state intervention does not guarantee the provision of welfare for citizens but rather the realisation of politically relevant symbolic projects, or the unfolding of modernisation programmes, often serving the interests of property investors.

New skyline in Istanbul.
Source: Gábor Csanádi

References

Atkinson, R., & Bridge, G. (2005). Introduction. In R. Atkinson & G. Bridge (Eds.), *Gentrification in a global context: The new urban colonialism* (pp. 1–17). Routledge.

Glass, R. (1964). Introduction: Aspects of change. In Centre for Urban Studies (Ed.), *London: Aspects of change*. London: MacGibbon & Kee.

Ley, D. (1980). Liberal ideology and the post-industrial city. *Annals of the Association of American Geographers, 70*(2), 238–258.

Smith, N. (1979). A theory of gentrification: A back to the city movement by capital not people. *Journal of the American Planning Association, 45*(4), 538–548.

Yasar, C. G., González, A., Kalliala, M., McKenzie, K., Miller, S., Orhan, E., Rusek, B., & Tasis, P. (2007). *Bicocca / Urban functionality of the future of Milan* (Intensive programme in spatial development planning, University of Milano). Retrieved from www.sociologia. unimib.it/DATA/Insegnamenti/2_1931/materiale/intensive%20 programme%202007%20-%20final%20report%20group%201.pdf

Participatory
Design

WORKSHOPS

Cottbus

Civic Housing

Small is Power

LEARNING SPACES

Urban Housing Regeneration

Urban Systems

PEDAGOGY

COMMUNITY
PARTICIPATION

PARTICIPATORY ACTIONS

Bratislava

Rimini

READERS

Issue 02/Chapter 09

Issue 02/Chapter 08

Issue 02/Chapter 06

Issue 02/Chapter 05

Issue 01/Chapter 02

RESEARCH

OIKOPEDIA

Post Occupancy Evaluation

Participatory Planning

Housing Innovations

Community Participation

Codesign

Capacity Building

Participatory Design

NADIA CHARALAMBOUS

Participatory design builds on the ideals of a participatory democracy where collective decision-making is highly decentralised throughout all sectors of society, so that all individuals can effectively participate in taking decisions that affect them in their daily environment (Sanoff, 2011).

Participatory design practitioners might vary with regard to their perspectives, backgrounds, and interests. However, they all share the view that design ideas arise in collaboration and that every participant is an expert in what they do. Therefore, it is important for all parties concerned to listen to each other's views and to work effectively as a multidisciplinary team, so that everyone's opinion is considered and integrated into the final design.

Community consciousness in the 1960s encouraged the direct involvement of the public in the definition of their physical environment. Subsequently decision-making processes were established offering services to enable citizens to participate in the design. In recent years, participatory design processes have been applied to a number of different fields, including housing design, and have been regarded as fundamental elements to achieve social sustainability and to deliver sustainable housing development policies.

Participation in design encompasses a diversity of decision-making forms involving different groups. Advocates of participatory design argue that a more democratic participation may raise awareness of the cultural and social qualities of localities at the policy-making stage, and consequently avoid conflicts that might later require greater policy implementation (Rydin & Pennington, 2000). Besides, it may contribute to promoting a sense of community by bringing together people who share common goals and facilitating what is referred to as collective intelligence (Fischer, Giaccardi, Eden, Sugimoto, & Ye, 2005). On the

other hand, some opponents to participatory processes contend that they produce consensus through the digestion or dilution of conflicts, thus preventing the system from changing and resulting in homogeneity (Miessen, 2011). Miessen argues that consensus can never lead to change or innovation and that every form of participation always carries a conflict within it. Therefore, he suggests that uninvited outsiders should intervene in a non-violent manner in political structures, systems and situations to create the necessary conditions for meaningful change.

RELATED CASES

Incremental Housing Strategy, India

Architects: Filipe Balestra and Sara Göransson

A housing project was developed in Bombay with the intention of promoting the cost-effective improvement of some of its districts without uprooting their communities. The architects developed strategies in collaboration with the existing communities to build houses that not only address today's necessities, but houses that the inhabitants can transform over time as their families grow, by themselves and without architects. In this way, houses can evolve "organically" while they preserve the existing social fabric. In this continuous adaptation process, the users do almost all of the construction work: Families help by fitting windows and doors, painting the house the colour they want, and placing floor tiles.

Participatory process. Source: Filipe Balestra & Sara Göransson/Urban Nouveau AB

Implementation in Yerwada's Netaji Nagar, Pune (India). Source: Filipe Balestra & Sara Göransson/ Urban Nouveau AB

Houses in Quinta Monroy, Iquique, Chile

Architects: Elemental —Alejandro Aravena, Alfonso Montero, Tomás Cortese, Emilio de la Cerda

The purpose of this project was to accommodate 100 families of the Quinta Monroy, in the same site that they had illegally occupied for thirty years, thus avoiding their relocation to the periphery of the city. This experimental project was conceived as a formal, high-density neighbourhood that could grow upwards filling in the gaps between the built units with the participation of the inhabitants. The belief that citizens should have some power in the decisions made on their living environment was essential to the project. Every house could be extended in order to accommodate the future growth of the families.

Housing units completed by residents. Source: Ludovic Dusuzeau, Sara Maestrello

Personalization of the inner spaces. Source: Tadeuz Jalocha & Ludovic Dusuzeau

References

Fischer, G., Giaccardi, E., Eden, H., Sugimoto, M., & Ye, Y. (2005). Beyond binary choices: Integrating individual and social creativity. *Human-Computer Studies, 63*(4), 482–512.

Miessen, M. (2011). *The nightmare of participation (crossbench praxis as a mode of criticality)*. Berlin: Sternberg Press.

Rydin Y., & Pennington M. (2000). Public participation and local environmental planning: The collective action problem and the potential of social capital. *Local Environment, 5*(2), 153–169.

Sanoff, H. (2011). Multiple views of participatory design. *Focus, 8*(1), 7.

Passive
Design

WORKSHOPS

LEARNING SPACES

PEDAGOGY

COMMUNITY
PARTICIPATION

PARTICIPATORY ACTIONS

RESEARCH

OIKOPEDIA

Urban Housing Regeneration

Barcelona

Building Performance Evaluation

Post Occupancy Evaluation

Sustainable Housing Design

Issue 01/Chapter 03

Issue 02/Chapter 02

Issue 02/Chapter 10

READERS

Passive Design

EDGARS BONDARS

Regardless of the part of the globe in which a dwelling might be located, one of its key functions is to protect dwellers from climate conditions. Due to innovations brought about by the Industrial Revolution in the 19th century and thanks to the rapid development of HVAC systems, buildings in the first half of the 20th century became more technically sophisticated than ever before. Indoor climate in buildings was typically regulated by advanced building systems, which actively used energy for heating or cooling purposes. However, in the second half of the last century our societies began to face a number of global economic and ecological problems, including the 1970s oil crisis and the environmental pollution created by the burning of fossil fuels. The building industry began to look for other solutions in line with the greater sensibility to sustainability. The aim was to provide a comfortable indoor climate primarily by taking advantage of the physical properties of building materials and secondly through improvements in building design (Olgyay & Olgyay, 1963; Burberry, 1978; Szokolay, 1986). Such solutions became known as *passive design*. Then, active energy-consuming engineering systems became a secondary component in ensuring the building indoor climate.

The goals of a passive design can be summarised as follows. The first goal is to minimise heat losses. This can be achieved by creating a well-insulated building shell and applying airtight measures to prevent the uncontrollable air exchange between indoor and outdoor spaces, as well as by making the building form as compact as possible (i.e., building surface-to-volume ratio must be as low as possible). Heated areas of a building must be separated from unheated ones (e.g., staircases, garages, etc.) in order to diminish thermal bridges. The second goal of a passive design is to maximise solar heat gains during the winter by increasing

south-facing glazing areas and reducing north-facing ones. This is carried out by sizing and arranging windows according to solar angles, thus avoiding shadows created by nearby buildings or vegetation. The third goal is to ensure a consistent indoor climate by using building materials with a high thermal capacity in order to minimise temperature fluctuations, thus providing the necessary window shading (e.g., by means of overhangs and blinds) to avoid overheating in the summertime, and to buffer humidity by applying absorbent indoor materials.

The concepts of *passive design* and *passive house* are not quite the same. Passive design is meant to be a set of design principles and methods that can be used to design any energy-efficient building, without necessarily having to reach the passive house standard. The application of passive design measures enables designers to obtain significant energy savings during the lifespan of the building. The effectiveness of these measures can be significantly improved with building energy performance calculations (using, for instance, the software PHPP—Passive House Planning Package at the building design stage), which help designers comply with the energy-efficiency requirements of a passive house, that is, of a building without a conventional heating system (Feist, 2013).The challenge for architects, however, is to balance the aesthetical, technological and ecological criteria and translate them into a contemporary architectural language.

Lielkalni. Energy-Efficient Building in Ģipka, Latvia
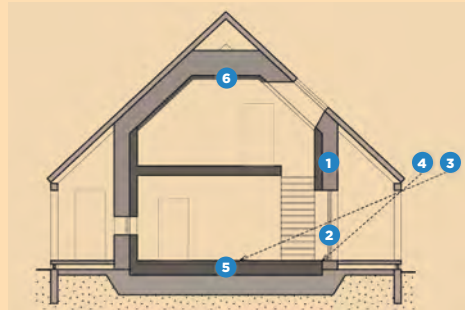
Architect: Ervins Krauklis

The design of this residential building located in a temperate continental climate reflects some features of the local architectural traditions in the form, proportions and sloped roofs. It is a an energy-efficient, highly-insulated building with an airtight shell. Its main features can be seen in the cross-section: **(1)** prevents heat losses, **(2, 3)** large south-facing windows ensure solar heat gains in winter when the sun is at a low angle, **(4)** it has large overhangs to prevent overheating in summer when the sun is at a high angle, **(5)** materials with high thermal mass are used in floors and walls to absorb and later release the heat energy, and **(6)** moisture absorbing materials are used in the ceiling to help to keep the indoor relative humidity constant.

Load-bearing exterior walls consisted of lightweight ceramsite concrete blocks, while the roof structure was built of nail plate timber trusses. Glass wool was the main insulation material for the walls and for the roof. The building's annual energy demand is 26 kWh/m² (not reaching the passive house standard which is 15 kWh/m²), while construction costs were 1,520 €/m².

LIELKALNI BUILDING: WEST FACADE

CROSS SECTION

Lielkalni, energy-efficient building in Ģipka, Latvia (2010). Source: Edgars Bondars

Ezernieki. Passive House in Jaunmārupe, Latvia
### Architect: Ervins Krauklis

This single-family residential building has small windows on the northern facade to diminish heat loss. The heated residential part **(1)** is compact to ensure the best area-to-volume ratio in order to minimise heat loss through the building shell. The unheated parts, like the garage and auxiliary rooms **(2)**, and the covered terrace **(3)** are integrated in the mass of the building, but at the same time, they are thermally separated from its heated core. The large southern glazed area provides enough light and energy and the movable shades prevent the room overheating during the summertime. Sealing tapes on all structural joints ensure the airtightness of the building. The structural system is made of a laminated timber frame, filled with insulation. The specific annual energy demand for heating is 14 kWh/m² (reaching the passive house standard), while construction costs are 1,000 €/m²).

"EZERNIEKI" BUILDING: NORTH FACADE

SOUTHERN GLAZING

SEALED JOINTS

Ezernieki, passive house in Jaunmārupe, Latvia (2016). Source: Edgars Bondars
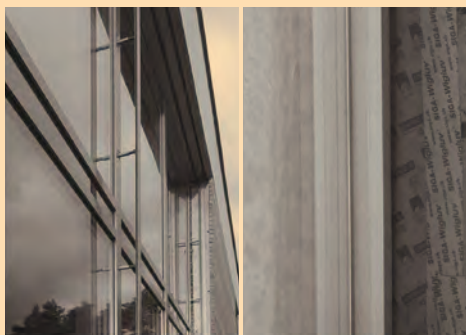
References

Burberry, P. (1978). *Building for energy conservation.* London: Architectural Press.

Feist, W. (2013). *Passive house planning package PHPP.* Darmstadt: Passive House Institute.

Olgyay, V., & Olgyay, A. (1963). *Design with climate: Bioclimatic approach to architectural regionalism.* Princeton, NJ: Princeton University Press.

Szokolay, S.V. (1986). Climate analysis based on the psychrometric chart. *International Journal of Ambient Energy, 7*(4), 171–182.

Social
Housing

WORKSHOPS

PEDAGOGY

LEARNING SPACES

COMMUNITY PARTICIPATION

PARTICIPATORY ACTIONS

RESEARCH

READERS

OIKOPEDIA

Lisbon

Habitat Regeneration Strategies

Housing Systems

Urban Housing Regeneration

Rimini

Affordable Housing

Housing Innovations

Housing Rights

Issue 01/Chapter 06

Issue 01/Chapter 05

Issue 02/Chapter 06

Issue 02/Chapter 10

Social Housing

LAURA NEIJENHUIS

There is no single definition of *social housing*. In the European context social housing is generally seen as serving a common interest, which is needed to increase the supply of affordable housing. It is specifically targeted to those vulnerable groups within society, whose socio-economic conditions would otherwise hinder their access to an adequate home (Scanlon, Fernández Arrigoitia, & Whitehead, 2014). To cover social housing needs, several models have been implemented in Europe. These models can broadly be divided under *universalistic* or *targeted* (Malpass, 2011). The universalistic model views housing as a public responsibility and hence the whole population has the right to affordable and decent housing. This model was mostly applied in the former communist regimes and in some northern and western-European countries. In these countries, there were no restrictions or limits set on the target group of social housing programmes and so for decades they effectively promoted and supported social housing at all levels of society. The countries in which the universalistic model prevailed still have a large share of social housing as part of their overall housing stock (Malpass, 2011).

When looking at the situation of social housing in the developing world, the European model is not always applicable. Therefore, one must form a common definition that can be applied to all countries, for example:

> **Social housing is the provision of a formal housing solution, in principle by the market but with government incentives (or in some cases by government directly) targeting and reaching the lower and middle-income segments of the population. So social housing is in particular aimed at providing, stimulating and enabling housing solutions for low- to middle-income households**

that can afford a formal solution but cannot access housing in the formal housing market without support. (Geurts, 2015)

This definition omits informal housing, that is to say, slum upgrading or incremental housing which is most often a housing solution for the poorest social groups.

Over the last decade, the neo-liberal agenda of the "enablement paradigm" has dominated the political and economic thinking in governments, especially in The Global South. The key objectives of enablement are to improve living standards through participatory development strategies, targeted at urban productivity, land delivery for low-income household, housing programmes, and poverty alleviation (Wakely, 2014). This paradigm has influenced government-supported housing projects in the region through measures such as privatisation. It has also led to a renewed interest in the acquisition of social housing. However, more recent discourses are advocating housing rights and a pro-poor approach.

Social Housing in South Africa

Social housing is one of the public housing programmes in South Africa. According to Huchzermeyer (2014) it is a relatively small public housing programme compared to other ones. The target population is relatively broad as it encompasses a wide range of income groups. In its current format, social housing programmes have been implemented since the new democratic government came to power in 1994. This means that the institutional, legal and policy frameworks have all been developed in just twenty years (Tissington, 2011). Social housing is predominantly a rental option managed by institutions such as the National Social Housing Association (NASHO). The Social Housing Regulatory Authority (SHRA) regulates the activities of these institutions (Huchzermeyer, 2014).

A social housing project in Cape Town, South Africa. Source: Ellen Geurts, Institute for Housing and Urban Development Studies, Rotterdam

Social Housing in Guatemala

Guatemala is combatting its severe housing shortage with different initiatives, among them social housing policies. One of the social housing systems is based on a successful housing cooperative in Uruguay, known as Federación Uruguaya de Cooperativas de Vivienda por Ayuda Mutua (FUCVAM), which received the 2012 World Habitat Award and consequently has been emulated in other Latin American countries (Bredenoord, van Lindert, & Smets, 2014). It is a mutual aid model which helps low-income households to build their home. Participants dedicate a part of their working day to building homes for each other. Although these types of cooperatives are becoming widespread in Guatemalan cities, the legal framework that regulates their activity needs to be clearly defined.

A neighbourhood in Guatemala City where a mutual aid model is used for home improvements. Source: Alonso Ayala Aleman, Institute for Housing and Urban Development Studies, Rotterdam

Social Housing in Romania

Since the start of the 1990s, Romania has undergone an institutional overhaul, and the change from a socialist to a market-based system has directly affected the operation of the housing systems (Tsenkova, 2009). Romania's current housing policy is defined by the *Programme for Housing Construction* (a cooperative of the Ministry of Regional Development and the local governments) which mainly provides financial support to local initiatives. The Romanian National Housing Agency (RNHA) also works together with municipalities to implement a *Programme for Rental Housing for Young People.* The main goal of the national programmes is not so much constructing new dwellings, but promoting the usage and refurbishment of existing buildings. However, the responsibilities of the actors involved in the implementation of the programmes are unclear to many (Neijenhuis, 2015). Access to social housing for national minorities such as the Roma, who make up a disproportionally high share of the vulnerable households in Romania, is practically impossible as they often cannot access social housing programmes and end up in informal housing.

Apartment blocks from the communist era converted into social housing in Bucharest, Romania. Source: Laura Neijenhuis, Institute for Housing and Urban Development Studies, Rotterdam

References

Bredenoord, J., Van Lindert, P., & Smets, P. (2014). *Affordable Housing in the Urban Global South Seeking Sustainable Solutions.* Routledge.

Geurts, E. (2015). *Handbook Post-Graduate Diploma Course: Developing Social Housing Projects (DSHP).* Rotterdam: Institute for Housing and Urban Development Studies.

Huchzermeyer, M. (2014). Changing Housing Policy in South Africa. In J. Bredenoord, P. van Lindert & P. Smets (Eds.), *Affordable Housing in the Urban Global South Seeking Sustainable Solutions* (pp. 336–348). Routledge.

Malpass, P. (2011). Path Dependence and the Measurement of Change in Housing Policy. *Housing, Theory and Society, 28*(4), 305–319.

Neijenhuis, L. (2015). *Housing Situation and Eviction Problems in Romania* (Internal Paper). Romania: Embassy of the Kingdom of the Netherlands in Romania.

Scanlon, K., Fernández Arrigoitia, M., & Whitehead, C. M. (Eds.). (2014). *Social housing in Europe.* London: Wiley Blackwell.

Tissington, K. (2011). *A Resource Guide to Housing in South Africa 1994–2010. Legislation, Policy, Programmes and Practice.* Retrieved from www.escr-net.org/sites/default/files/SERI_A_Resource_Guide_to_Housing_in_South_Africa_Feb11_0.pdf

Tsenkova, S. (2009). *Housing Policy Reforms in Post-Socialist Europe: Lost in Translation.* Springer Science & Business Media.

Wakely, P. (2014). *Urban Public Housing Strategies in Developing Countries: Whence and Whither Paradigms, Policies, Programmes and Projects* (DPU Working Paper Series: Reflections No. 163/60. DPU, The Bartlett, UCL). Retrieved from www.ucl.ac.uk/bartlett/development/sites/bartlett/files/wp163.pdf

Sustainable
Housing Design

WORKSHOPS

PEDAGOGY

LEARNING SPACES

COMMUNITY
PARTICIPATION

PARTICIPATORY ACTIONS

RESEARCH

READERS

OIKOPEDIA

Lisbon

Habitat Regeneration Strategies

Housing Systems

Urban Housing Regeneration

Urban Systems

Barcelona

Skopje

Area-Based Interventions

Healthy Cities

Participatory Design

Participatory Planning

Passive Design

Urban Greening

Urban Regeneration

Issue 01/Chapter 02

Issue 01/Chapter 03

Issue 01/Chapter 07

Issue 02/Chapter 02

Issue 02/Chapter 05

Issue 02/Chapter 08

Issue 02/Chapter 10

Sustainable Housing Design

KARIM HADJRI, ISAIAH OLUREMI DUROSAIYE

Sustainability is the balancing act of harmonising human activities and potentials with the finite resources offered by nature. As defined by Brundtland (1987, p. 16), the human ability "to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" sits at the core of sustainable development. Rightly so, the provision of contemporary housing should be conceptualised beyond meeting the needs of the present users, to span resource management that cuts across social, economic and environmental domains of all human activities through various generations. This ethos should help ensure sustainable design is a key component of future housing provision.

Sustainable housing design is usually associated with the efficient use of energy of residential buildings. Hence, an increasing political and economic pressure to reduce domestic energy consumption, combined with the potential effects of climate change on the built environment have contributed to a rapid change in legislation for housing design and provision across the European Union (EU) (European Commission, 2013). Nevertheless, sustainable design constitutes far more than the EU agenda on the reduction of greenhouse gas emissions (European Commission, 2010). According to Manzini (2007), sustainability requires a systemic thinking approach in which current practices of "production and consumption are discontinued" in order to pave the way for improved quality of the social and physical environment. A sustainable housing design, thus, has more to offer than aesthetics and functionality (Farmer, 2013).

There are a variety of approaches to foster sustainable housing design. First, sustainable design in contemporary housing procurement and regeneration is expected to

apply cradle-to-cradle design concepts, in which the construction technology supports the reusability of the materials (Monahan & Powell, 2011). Also, a sustainable design should encompass not only the construction phase but also the deconstruction of the building into parts, as opposed to its simple demolition at the end of its useful life. This favours reuse of existing building components, which has a better environmental impact compared to recycling or even final disposal. Contemporary housing provision must then consider the whole building life-cycle, and measures should be taken to ensure that the building's environmental impact is reduced to the minimum possible. There are advanced methodologies, like Life Cycle Assessment (LCA) to assess the environmental impact of a building throughout its life-cycle (Basbagill, Flager, Lepech, & Fischer, 2013; Basti, 2010). Such an assessment would consider not just the energy embodied in the materials used to construct the building (including the energy used in their transportation to the site and in the recycling of these materials), but also the energy consumption of the building throughout its lifespan and the adaptability at the end of its useful life for other purposes. Furthermore, there is a school of thought that suggests that the term *sustainable design* must embrace a whole ecosystem including the interaction between humans and the built and natural environments (Tippett, Handley, & Ravetz, 2007). Such ecological approaches to defining sustainable design inadvertently suggest that the status quo of this interrelationship may be maintained in equilibrium over an extended period of time, through design (Cole, 2011).

Finally, a sustainable design will consider the social aspects and consequences of achieving economies of scale through compact building. Thus, intensifying land use

in the form of high-rise, high-density residential housing can help achieve sustainability in urban areas (Ancell & Thompson-Fawcett, 2008). However, such intense use of space within the built environment will, inevitably, result in the reduction of the constituent individual's access to the encompassing natural environment, which some social and environmental scientists identified as a source of social conflicts in neighbourhoods a few decades ago (Baum & Davis, 1980; Freedman, Levy, Buchanan, & Price, 1972; Gillis, 1977).

Incorporating sustainable design into everyday design thinking cannot be achieved in isolation. Therefore, to ensure social equity, sustainable design would embrace the principles of universal design. Furthermore, the ability of the design community to learn from an existing building through post-occupancy evaluation of the building's performance is a prerequisite to an all-inclusive sustainable design. Environmental conservation, on the other hand, can be achieved through brownfield regeneration, while compact design could help to achieve economies of scale in urban planning and development. Being oblivious to sustainable design has long-term global ramifications, as the consequences of greenhouse gas emissions cannot be contained within national borders.

RELATED CASES

BedZED, London, UK

Beddington Zero Energy Development[1] or BedzED was initiated by sustainability experts BioRegional and architects zEDfactory, and developed by housing association Peabody. Completed in 2002, BedzED was the UK's first large-scale mixed-use sustainable community. Sustainable design is built in through the use of passive solar heating, high insulation, natural ventilation, a communal boiler, photovoltaic panels, and water saving appliances. The development was also built using low impact construction and materials sourced locally therefore reducing environmental impact.

1. See bioregional.com/bedzed

Vauban, Freiburg, Germany

The Vauban district[2] in Freiburg is a model for sustainable living, combining cohousing approaches with ecological design. In 1996, it was presented as a German Best Practice on the UN HABITAT II conference. Between 1997 and 1999, Forum Vauban coordinated the EU funded LIFE project *Realisation of the Sustainable Model District Vauban.* The project's results include a large car-reduced residential area, all houses with low-energy standard, several passive houses, many cooperative building projects with ecological measures, and a market place with a community centre.

2. See vauban.de/en/topics/history/276-an-introduction-to-vauban-district

Residential buildings at Heinrich Mann street. Source: Leandro Madrazo

Market square and community centre. Source: Leandro Madrazo

References

Ancell, S., & Thompson-Fawcett, M. (2008). The Social Sustainability of Medium Density Housing: A Conceptual Model and Christchurch Case Study. *Housing Studies, 23*(3), 423–442. doi: 10.1080/02673030802029990

Basbagill, J., Flager, F., Lepech, M., & Fischer, M. (2013). Application of life-cycle assessment to early stage building design for reduced embodied environmental impacts. *Building and Environment, 60*(0), 81–92. doi: dx.doi.org/10.1016/j.buildenv.2012.11.009

Basti, A. (2010). Life cycle design of building elements: selection criteria and case study application. *Eco-Architecture Iii: Harmonisation between Architecture and Nature*, 309–320. doi: Doi 10.2495/Arc100261

Baum, A., & Davis, G. E. (1980). Reducing the stress of high-density living: An architectural intervention. *Journal of Personality and Social Psychology, 38*(3), 471–481. doi: 10.1037/0022-3514.38.3.471

Brundtland, G. (1987). Report of the UN World Commission on Environment and Development: Our Common Future (The Brundtland report). *World Commission on Environment and Development.* Oxford: Oxford University Press.

Cole, R. J. (2011). Regenerative design and development: current theory and practice. *Building Research & Information, 40*(1), 1–6. doi: 10.1080/09613218.2012.617516

European Commission. (2010). *Europe 2020 Strategy*. Retrieved from ec.europa.eu/europe2020/documents/related-document-type/index_en.htm

European Commission. (2013). Directive 2010/31/EU of European Parliament and the Council on Energy Performance of Buildings. *Energy Performance of Buildings.* Retrieved from eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0031&from=en

Farmer, G. (2013). Re-contextualising design: Three ways of practising sustainable architecture. *ARQ: Architectural Research Quarterly, 17*(02), 106–119. doi: 10.1017/S1359135513000468

Freedman, J. L., Levy, A. S., Buchanan, R. W., & Price, J. (1972). Crowding and human aggressiveness. *Journal of Experimental Social Psychology, 8*(6), 528–548. doi: dx.doi.org/10.1016/0022-1031(72)90078-9

Gillis, A. R. (1977). High-rise housing and psychological strain. *Journal Of Health And Social Behavior, 18*(4), 418–431.

Monahan, J., & Powell, J. C. (2011). An embodied carbon and energy analysis of modern methods of construction in housing: A case study using a lifecycle assessment framework. *Energy and Buildings, 43*(1), 179–188.

Tippett, J., Handley, J. F., & Ravetz, J. (2007). Meeting the challenges of sustainable development—A conceptual appraisal of a new methodology for participatory ecological planning. *Progress in Planning, 67*(1), 9–98. doi: dx.doi.org/10.1016/j.progress.2006.12.004

Urban Greening

SAŠO MEDVED, CIRIL ARKAR, SUZANA DOMJAN

Urban greening—the greening of urban surfaces—has recently gained the attention of urban planners and architects because green roofs or green facades have a significant influence on the mitigation of urban heat islands and storm-water retention which in turn help to improve the microclimate (Barardi, Ghaffarianhoseini, & Ghaffarianhoseini, 2014; Gagliano, Detommaso, Nocera, & Evola, 2015). Such building elements also improve the air quality and thus contribute to a reduction of health problems, by capturing CO_2, heavy metals, volatile organic compounds and other air pollutants. Green spaces also have positive impacts on the quality of social life because they can be used as community gardens or recreational areas. Another environmental advantage is that they contribute to enhance urban biodiversity.

Green roofs are the most common solution to make urban areas green. Intensive green roofs require a deep layer of soil to grow plants like lawns, bushes and small trees. However, they need frequent irrigation, maintenance of the vegetation layer and a solid roof construction. In an extensive green roof the soil layer can be replaced by a thin layer made of a mineral-wool substrate and a vegetation blanket consisting of sedums, mosses and herbs. Such plants are very light weight, demand little maintenance and only occasional irrigation, even in hot and dry climate conditions.

Green roofs can substantially decrease the energy demand for cooling and heating. During the summertime, the roof's thermal resistance and the high share of absorbed solar radiation by the vegetation layer help to reduce the heat gains.

Evapotranspiration cooling considerably decreases the surface temperature in comparison to traditional roofs (Gagliano et al., 2015). Green roofs also reduce the heat

losses during the winter because of their enhanced thermal capacity (Ouldboukhitine, Belardi, Jaffal, & Trebelsi, 2011) and the stored heat from solar radiation (Jaffal, Ouldboukhitine, & Belardi, 2012). Besides the improved thermal performance of the building envelope, the main benefit of green roofs is their rainfall-water retention. It was found that up to 40% of the annual rainfall in a mild climate and almost all annual rainfall in a hot climate could be retained with extensive green roofs (Arkar, Domjan, & Medved, 2015).

RELATED CASES

Model of Energy and Hydrological Performance of Extensive Green Roofs

Despite widespread awareness of the importance of urban greening, optimistic predictions about its effectiveness are very frequent. To avoid incorrect decisions of urban planners, computer tools for heat and water transfer prediction in urban green areas should be used in the decision-making process. These computer tools can take into account detailed structure and properties of green areas and other important factors such as local hour-by-hour climate conditions. Such a tool was developed for the modelling of extensive green roof thermal and hydrological response by the Laboratory for Sustainable Buildings, at University of Ljubljana. A numerical model was created using multi-annual in-situ measurements on test polygon. Based on this model, a computer tool enables the calculation of heat and water transfer in green-roof construction by using local meteorological data in the form of the Test Reference Year, the heat losses and heat gains of the green roof, the amount of retained rainfall, and the reduced needs for irrigation. As a case study,
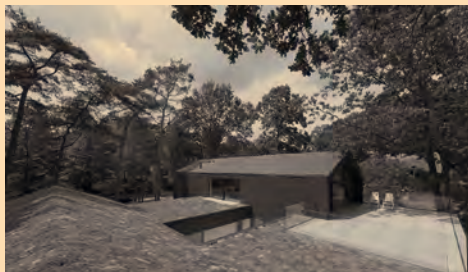
Extensive green roof on residential building in Brasschaat, Belgium.
Source: Knauf Insulation

performance of extensive green roofs in cities with deferent climate conditions were analysed. The results of the study showed that, in comparison to common roof constructions, there is a decrease of the building heat gains in the summertime between 75% in a hot climate (Athens) and 55% in a mild-climate (Ljubljana). The all year rainfall retention is between 40% in Ljubljana, and up to 100% in Athens. Finally, water need for irrigation is reduced by 75% in mild-climate conditions and 10% in a hot climate. All the values significantly depend on the thickness of the substrate layer—between 2 and 8 centimetres—, a dimension which needs to be set in accordance with local climate conditions.

Extensive green roof on industrial building in Škofja Loka, Slovenia. Source: Knauf Insulation

References

Arkar, C., Domjan, S., & Medved, S. (2015). *Thermal and hydrological response of green roofs in different climatic conditions*. Ljubljana: University of Ljubljana, Faculty of Mechanical Engineering.

Barardi, U., Ghaffarianhoseini, A.H., & Ghaffarianhoseini, A. (2014). State-of-the-art analysis of the environmental benefits of green roofs. *Applied Energy, 115*, 411–428.

Gagliano, A., Detommaso, M., Nocera, F., & Evola, G. (2015). A multi-criteria methodology for comparing the energy and environmental behaviour of cool, green and traditional roofs. *Building and Environment, 90*, 71–81.

Jaffal, I., Ouldboukhitine, S.E., & Belardi, R. (2012). A comprehensive study of the impact of green roofs on building energy performance. *Renewable Energy, 43*, 157–164.

Ouldboukhitine, S.E., Belardi, R., Jaffal, I., & Trebelsi, A. (2011). Assessment of green roof thermal behaviour: A coupled heat and mass transfer. *Building and Environment, 46*(12), 2624–2631.

Urban Heat
Islands

Cottbus

WORKSHOPS

Habitat Regeneration Strategies

LEARNING SPACES

PEDAGOGY

Urban Systems

Issue 02/Chapter 02

Issue 01/Chapter 07

READERS

COMMUNITY
PARTICIPATION

PARTICIPATORY ACTIONS

Bratislava

Issue 01/Chapter 03

RESEARCH

Urban Regeneration

Urban Greening

Sustainable Housing Design

Passive Design

OIKOPEDIA

Healthy Cities

Urban Heat Islands

SAŠO MEDVED, SUZANA DOMJAN

The majority of people in developed countries live in cities. A city's growth not only influences the appearance of the landscape, it also changes the characteristics of the environment (Oke, 1973). One of the most noticeable changes is the formation of specific microclimatic conditions, which means that the temperatures in cities are warmer than in the surrounding rural areas. This phenomenon is known as the *Urban Heat Island* (UHI) (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Santamouris, 2006). An UHI is a consequence of the lower reflectivity of the solar radiation in urban areas; the increased atmospheric longwave thermal radiation due to the photo-chemical smog and airborne particles; the reduced latent-heat storage because of the smaller green areas and changes in the rainfall due to the more intense runoff and the large anthropogenic heat sources. The effect of UHIs can cause temperature rises of up to 10 °C in a metropolis, a change which is particularly noticeable in summer months.

The UHI effect influences the comfort in both indoor and outdoor environments as well as energy use, especially for the cooling of buildings. Therefore, UHI mitigation must be considered in the planning of urban areas. The following measures have proven to be the most effective:

- to increase the longwave radiation losses by radiation heat exchange between buildings and the sky by lowering the screening of the skyline;
- to decrease the stored sensible heat of solar radiation by means of surfaces with a higher albedo; and
- to increase the latent heat storage with grass and water surfaces, as well as parks.

The integration of urban parks into the urban environment can significantly decrease the UHI effect. The potential

for a UHI decrease is commonly evaluated with computer tools, like ENVI-met.[1] The heat transfer and evaporative cooling of the grass layer and the trees are modelled for a growth period by means of empirical models, using the tree crown size and shape as a function of the tree age, in combination with evapotranspiration models based on the leaf area index. During the summer, the maximum air temperature difference between a park and the surrounding urban area can be as high as 3–5 °C. Furthermore, the cooling effect of the parks can be observed up to 500 metres away in the surrounding built environment.

1. See envi-met.com

RELATED CASES

Study of the Mitigation of the Urban Heat Island Effect in a Built-Up Environment with Urban Parks

The Computational Fluid Dynamics method is most often used to calculate the cooling potential of water surfaces, green areas and parks in urban areas. This method was used to predict the Park Cooling Potential (PCP) of the Zvezda Park and its surrounding built environment (Vidrih & Medved, 2013). A PCP analysis was made taking into account the area, planting density and age of the trees.

IMAGE ©2016 DIGITALGLOBE, MAP DATA ©2016 GOOGLE

Zvezda Park in the city centre of Ljubljana. Source: Google Maps (2016)

Park Cooling Potential prediction of Zvezda Park. Source: Vidrih and Medved (2013)
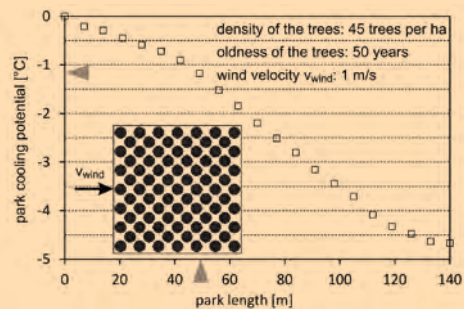
References

Bowler, D. E., Buyung-Ali, L., Knight, T. M., & Pullin, A. S. (2010). Urban greening to cool towns and cities: A systematic review of the empirical evidence. *Landscape and Urban Planning 97*(3), 147–155.

Oke, T. R. (1973). City size and the urban heat island. *Atmospheric Environment, 7*(8), 769–779.

Santamouris, M. (Ed.). (2006). *Environmental design of urban buildings: An integrated approach*. London: Earthscan.

Vidrih, B., & Medved, S. (2013). Multiparametric model of urban park cooling island. *Urban Forestry & Urban Greening, 12*(2), 220–229.

Urban
Regeneration

COMMUNITY
PARTICIPATION

PEDAGOGY

RESEARCH

WORKSHOPS

LEARNING SPACES

PARTICIPATORY ACTIONS

OIKOPEDIA

READERS

Belgrade
Cottbus
Lisbon

Growth/Shrinkage
Habitat Regeneration Strategies
Renewing/Revitalizing
Urban Housing Regeneration
Urban Systems

Bratislava

Affordable Housing
Area-Based Interventions
Brownfield Regeneration
Capacity Building

Participatory Design
Participatory Planning
Urban Greening
Urban Heat Islands

Issue 01/Chapter 03
Issue 02/Chapter 03
Issue 02/Chapter 04
Issue 02/Chapter 05
Issue 02/Chapter 10

Urban Regeneration

NADIA CHARALAMBOUS

Urban regeneration is primarily concerned with the upgrading of inner city centres, former industrial or residential areas facing periods of decline due to major short or long-term economic problems, deindustrialisation, demographic changes, social tensions, physical changes and deterioration, among others.

Urban decay has initially been addressed through economic and planning policies geared towards physical and economic renewal and revitalisation of the affected areas. A recognition that successful regeneration should also include social and environmental policies resulted in a shift from specific urban renewal and revitalisation techniques to more comprehensive urban regeneration strategies (Couch, 1990). Those strategies encompass action plans to solve urban deterioration through a lasting improvement in the economic, physical, social and environmental conditions. A strong emphasis is placed on creating links between the physical transformation of the built environment and the improvements of the social conditions. The outputs of such a comprehensive regeneration process can be grouped in five headings: Neighbourhood strategies, training and education, physical improvements, economic development, and environmental action (Roberts, 2000).

Urban regeneration projects need to face a number of complex and diverse issues such as social cohesion, housing supply, economic development and affordability. They also need to address needs for infrastructure investments such as new roads and public transport, public realm improvements and the refurbishment of existing buildings.

The spatial scale of urban regeneration programmes varies from local area-based projects to broad national policies. Different kinds of problems need to be dealt with at different spatial levels. Likewise, each policy level

should be considered while working on a specific scale. Further challenges might stem from the tensions between top-down regeneration policies and bottom-up community needs, expectations and initiatives. It is widely accepted in democratic societies that urban regeneration processes should involve multiple stakeholders, including residents, in order to stimulate local economies and prevent the displacement of inhabitants from one area to another (Roberts & Sykes, 2000).

Housing revitalisation and improvement of the physical and built environment of neighbourhoods are often high in the agenda of urban regeneration projects aiming at supporting the creation of enduring local communities.

RELATED CASES

Zirmunai Triangle Project, Vilnius, Lithuania

Zirmunai is one of the oldest and most deteriorated districts of Vilnius, a neighbourhood of 12,000 residents. The aim of the project was to find ways to regenerate a district with little space for new construction and apartment owners not willing to invest in their rapidly deteriorating homes. In 2013, the municipality joined the URBACT RE-block network in order to start a regeneration process with the goal to improve houses, public spaces and the social environment in general. A comprehensive plan for the regeneration of the large-scale housing neighbourhood was drafted as a joint endeavour involving the municipality, residents, representatives of local businesses and institutions. Initially, the group helped to identify the main problems to be addressed according to the residents. Later on, they collaborated in the preparation of design proposals and a regeneration plan for the area.

Taht-el-Kale Neighbourhood, Nicosia, Cyprus

The quarter of Taht-el-Kale is one of the traditional neighbourhoods of the walled city of Nicosia, situated very near the buffer zone that divides the city into two sectors. The shrinking and ageing of the population, the reduction of the productive base, the lack of open public spaces, and the deteriorating conditions of housing were some of the most important problems to be solved. There were also major problems of traffic and accessibility mainly due to the dependency on private cars. The plan for a socio-economic regeneration of the area includes housing revitalisation, improvement of the physical and built environment of the neighbourhood, restoration of historic buildings and upgrading of public spaces. The proposed actions comprise the restoration of facades and fences of buildings facing the roads; the refurbishing of buildings of significant architectural value; the redesign of public spaces and roads in order to improve pedestrian accessibility, particularly for disabled people, including lighting and urban equipment; the creation of small public open spaces; the rearrangement of common service infrastructure and upgrading of the sewage system, and new traffic arrangements.

The urban regeneration of Taht-el-Kale. Source: Maria Ioannou

References

Couch, C. (1990). *Urban renewal*. London: MacMillan.

Lawless, P., Foden, M., Wilson, I., & Beatty, C. (2010). Understanding area-based regeneration: The New Deal for Communities Programme in England. *Urban Studies, 47*(2), 257–275.

Roberts, P. (2000). The evolution, definition and purpose of urban regeneration. In P. Roberts & H. Sykes (Eds.), *Urban regeneration. A handbook*, (pp. 9–36). London: Sage Publications.

Roberts, P., & Sykes, H. (2000). Current challenges and future prospects. In P. Roberts & H. Sykes (Eds.), *Urban regeneration. A handbook*, (pp. 295–314). London: Sage Publications.

Tyler, P., Warnock, C., Provins, A., & Lanz, B. (2013). Valuing the benefits of urban regeneration. *Urban Studies, 50*(1), 169–190.