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Sustainable high-rises in a sustainable development—the case of Salford Quays

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Abstract

The purpose of this research is to analyse the design approaches towards creating a sustainable and viable environment. The research questions presented in this study are what is the quality of high-rises and their surroundings; what facilities and functions are deployed in the research area; is there an infrastructural capacity to meet higher population density; is there diversity and mix of uses and public spaces. The paper demonstrates that high-rise buildings provided with a complete set of amenities and following successful design principles and practices are a viable typology benefiting its urban setting with a compact form, higher density and aesthetical qualities, enriching and enabling mixed used urban developments.

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1. Introduction

Regeneration of former industrial zones in the city is a result of restructuring international economy. The decline of certain industries has left abundant areas suitable for transformation with a great potential for accommodating new functions and occupants’ needs.

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1.1. High-rises advantages and disadvantages

High-rises are persisting typology in many regeneration projects. This is imposed by the scarcity of land in the inner cities and the growing population. Living in high-rise has advantages as well as disadvantages. On the positive side high-rises can accommodate more people closer to work locations, thus reducing the length of work trips and fuel consumption. The high-rise living is increasingly associated with prestige and status (Johnson, 2002). High-rises can support a great number of amenities on the ground floor such as shopping center, pool, gyms, public spaces for social interaction. The higher levels often offer spectacular views and are valued for their sensation of height (Haber, 1977). Elderly people do very well in high-rise buildings (Newman, 1966). However, the people can feel a psychological strain from being separated from nature and growing feeling of insolation. It might be hard to sustain neighborhood relations. Fear of crime is not uncommon. The disturbance from the others can be difficult to handle (Reddy, 1996). Low-rise buildings have the advantage of private garden, while the high-rises might have balconies, but they are often not very functional because of the small size and high winds. If the area has no good public green spaces the occupants might feel like in a “concrete jungle”.

1.2. High-rises and social integration

High-quality design of the high-rises and their environment increases residential satisfaction and along with affordability is connected to more social integration if the needs of different social groups are met. Residential satisfaction depends on objective housing characteristics such as good indoor environment, apartment layout and size, building age, maintenance, location in the city and disturbances caused by neighbors. There are many studies of residential satisfaction in high-rises but very little fully link the factual data with the features of the design and the enhanced quality of life. Creating sustainable developments should follow the principle of universal design. Universal design is the changing of the environment so that it can be approached, comprehended and utilized to the greatest extent possible by all people of different age, number, ability or disability (Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, 2009). Extracting such principles from the example of the Salford Quays is one of the main objectives of this study.

1.3. The aim of the study

This study aims at analysing factual information from observation of the Salford Quays high-rises on their quality in connection with the high-rise living in sustainable, regenerated district. The research questions opened by this study are:

- What is the quality of high-rises and their surroundings;
- what facilities and functions are deployed in the research area;
- is there an infrastructural capacity to meet higher population density;
- is there diversity and mix of uses and public spaces.

1.4. Literature review

High-rises are the natural response to expensive and scarce land and dense population. The habitual design responses of urban regeneration need to be based on knowledge of the villages and neighborhoods subject to transformation into self-sustaining communities (Deakin and Allwinkle, 2007). Detailed analysis of the conditions of the urban area will set clear objectives and will allow achievement of all these strategic objectives (Roberts,
There are two major topics in the sustainable neighborhoods’ agenda: consolidation and brownfield redevelopment. Consolidation is seen as prevention of urban sprawl and thus protecting natural resources and agricultural land around the cities, decrease car dependence, and make the existing urban infrastructure more efficient (Fincher and Wiesel, 2012). However, livability is a primary goal for urban planning, so urban consolidation diminishing livability is a negative outcome for both local residents and urban planning (McCrea and Walters, 2012). It might lead to poor living environment if the management and design are not taking into consideration the needs of the residents and the density is too big. Searle (2003) points out five possible limitations on urban consolidation in the urban fabric of cities: infrastructure capacity, land capacity, maximum density, loss of economic activity, and market demand. In a survey by Shaw and Houghton (2008) the biggest threat for the residents is increased traffic congestion. Loss of residential character, increased road danger for children, noise pollution, increased crime and vandalism and reduced privacy were also pointed out as negative outcomes of the consolidation. On the other hand, reuse of brownfields can lead to many benefits from economic and social nature, and environmental benefits, such as achievement of environmental quality and better quality of life for the residents, mitigation of health threats, availability of land for residential and commercial purposes, provision of new jobs.

Housing is another major problem to consider in creating robust and appealing communities. Building construction, design, comfort, size, and other features of high-quality housing are equally important as “affordability, accessibility, energy efficiency, waste management, security”, etc. (Maliene and Malys, 2009). Designers must attempt to reduce the division from the nature often imposed on residents of traditional high-rises. It is achievable by the provision of easy and many opportunities to exposure to daylight and vegetation within the building, improved ventilation to the outside air and avoidance of toxic materials, and by maximum access to light and views through the windows (Wener and Carmalt, 2006). A combination of nature and built environment, urban greenspaces are represented by parks, sport playgrounds and green walkways. They are part of the urban ecosystem, with many different uses, such as natural habitats, experiencing the nature and recreational functions. Nature in cities is valued for its environmental and amenity advantages, as well as the positive effect on psyche and the health. The harmonious human–nature relationship and facilitated social interaction and cohesion are of great importance for the residents of high-rises, especially when a sense of place and belonging amongst occupants is created. In dense neighborhoods, parks to close to residents provide pleasant recreational facilities. Landscapes by residential buildings also can be extended living rooms for people living in small apartments. (Lo and Jim, 2012).

1.5. Research area background

Salford Quays is regeneration project in Salford, Greater Manchester, England, near the end of the Manchester Ship Canal. Once a part of the Manchester Docks, it is among the first and the most prominent urban design successes, reclaiming industrial land after the closing of the Docks in 1982. Sustainability of the urban design includes diverse architecture, accessible public spaces, higher urban densities, large number of amenities, building meeting large spectre of needs and successful placemaking. Environmental benefits include re-use of brownfields, shorter transport trips, good public transport. Finally, the community aims at a good sense of identity and belonging, tolerance and respect between different people and low levels of crime and anti-social behaviour.

Initially, the residential buildings were traditional low-rises located in the in Grain Wharf and Merchants Quay but with the area development were introduced high-rises in order to take maximum advantage of the scarce pier space. Imperial Point is the first high-rise residential building on the Quays. It is 16-storey tower close to the Lowry Outlet Mall on Pier 8, finished in 2001. Sovereign Point is a sister building of Imperial Point, situated to the back of the Lowry Outlet Mall and completed in 2005. Most of its 20 storey are residential, except for some commercial spaces at ground level. The NV Buildings are 18 storey residential towers completed between 2004 and 2005. Overlooking the Huron Basin, their curved facades are representing sails. The City Lofts are completed in late 2007 and consists of two linked towers: one 9 and one 19 storey. Finally, The Heart and NumberOne residential towers rise with the completion of MediaCityUK in 2010.
2. Results

2.1. Research method

Considerable data can be gathered by just observing. Direct observation is underused and valuable method to collect evaluation information and has been chosen as an appropriate methodology to conduct this study. Direct observation is indispensable when there is physical evidence that can be readily seen. The observation conducted for the study is covert, so the observed people proceed with their daily routines undisturbed and there is no need for obtaining respondents’ agreement to participate in the study. But this poses potential ethical problems. However the privacy and anonymity of all the participants were preserved and the observation focused on the built environment, not the people. Observation checklists and structured questions have been implemented for the purposes of collecting thorough and complete data. The methodology relies on observation of the researched area, conducted by the guidelines of a template from Marcus, et al. (1998). The site was visited twice: in February and June 2015, during which the checklists and questions were used and photographs were taken.

2.2. High-rises sustainable features

Salford Quays high-rises have distinctive design features that define their place in the sustainable design of the development. First of all is their integration in the spaces around them. To start with, the NV buildings are situated on a large plot serving as private parking, surrounded by fences. The place feels safe but not varied nor attractive, it lacks amenities and social functions and does not complement the public realm neither with appearance nor with facilities, which undermines its social sustainability and the integration of families with children and the elderly. On the contrary, the Imperial Point is wonderfully integrated in the pedestrian system of canals and walkways. By the building there are parking space and green areas which unify visually the space around and the green pathway by the canal. The massing of the building is well distributed and a lower portion correspond to the pedestrian functions of the spaces around it. The materials of the building are in harmony with the street pavement and create one holistic, well-conceived space. Sovereign Point is also very well integrated with the street and the pedestrian facilities available, and is using sensible mass distribution to address the lower buildings around. City Lofts are situated next to the NV buildings and share the same unattractive connection with the built environment as the three buildings. The Heart and the NumberOne also maintain good connection with their surroundings provided by materials and shapes.

The distinctive design of all the high-rises contributes positively to the architectural richness of the buildings’ settings. They also create important landmarks in vital street junctions and complement the character of the places by their unique architecture. Their significant height makes them visible from great distances, emphasizing key locations and adding shapes to the skyline. The buildings have good legibility, ease of access and movement which are features of good urban design.

Two features define the high-rises as sustainable as a result of the observation. First is their appealing design. It evokes civic pride and assists creation of strong community, good environmental quality, contributing to the social sustainability. Another is their location: the buildings are situated at a medium distance from one another, thus loading the infrastructure regularly and helping avoid overcrowding from people and vehicles when in the same time intensifying the benefits from functions and services of the development by active use by the residents.

2.3. Public realm elements and features

One of the most important elements of the public realm is the provision of parks and gardens. Their importance is often neglected. Properly developed landscaping can foster socializing among residents and positively affect their quality of life. It can encourage walking and cycling as a pleasant alternative of driving. There are two large green
spaces in the vicinity of the high-rises but they are not visible from their location. Weaste Cemetery and Ordsall Park are designed as recreation parks managed for public use and appreciation in a green environment. They are in five minutes walking distance and Ordsall Park has been provided with sport facilities. They largely enhance the livability of the neighborhood. Besides these two parks the plaza between the Heart and the NV buildings is designed as a garden with plenty of grass and planting which act as immediate green oasis from the concrete and steel environment.

Successful recreational spaces should include areas for active, undisturbed, calm, social, imaginative, creative, experimental and natural play. Unfortunately, there haven’t been found children playgrounds around the high-rises. This complicates the situation for couples with young children because people might not want children to play around the tall building making noise. These couples might prefer low-rise house with garden, thus diminishing the social integration in the high-rises. This is striking omission in otherwise comprehensive and complete set of facilities and functions.

These and other issues bring up the question of the quality of the public spaces: their number, features, diversity of function. The high-rises have very little public space in their immediate vicinity but in five-minute’ walk from their location there is an enormous diversity of high-quality walkways with water features, plazas, different social functions encompassed by lower buildings which really enhances the social sustainability of the high-rise settings. Shops are not dispersed on the site but are concentrated in the Lowry. Providing goods for the specific needs of the area makes it convenient, service-oriented, pedestrian-scaled and suits the lifestyles of the residents. Retail and residential functions depend on one another for success. Mixed used developments are especially beneficial: a mix of housing and offices creates more customers, supports longer business hours. Besides the retail, cultural facilities are available on the site. The Imperial War Museum provides residents and visitors with a place to spend quality time, The Lowry cinema is a place for entertainment and spending leisure hours. International concert venue and art gallery can also be found there. Leisure and culture has a positive impact on the residents’ life, bringing additional tourism and making the Quays attractive place to live. Cultural facilities promote sustainability, diversity and identity. Cultural facilities provoke civic conversations, as well as enhancing economic opportunities for the place and entertaining visitors. However, the ground floors of the high-rise buildings in Salford Quays are unfortunately deprived by and social function. They are unanimated, surrounded by unwelcoming fences and adjacent to parking lots, which creates the feeling that they are isolated and underused (Fig. 1). The security of the buildings is thus enhanced, but it is not natural meaning the entrances of the buildings are not overlooked by adjoining buildings.

Fig. 1 (a) The NV Building surroundings (b) Imperial Point tower base (c) The Heart tower base
The problem with the overwhelming vandalism in UK is in the roots of many negative effects such as significant financial losses, destruction of the public realm, lack of residential satisfaction, etc. The general obstructed access of the high-rise buildings however protects them against this problem. Once the buildings are approached, they all have a good lobby suitable for minor interaction between residents and visitors. The building design also capitalizes on the benefits of good physical appearance with attractive form and detail that affects positively the mental state of the observer. The buildings are executed with high-quality, which enhances their livability, affects positively the self-esteem of the residents and promotes sense of pride and satisfaction with their living environment.

Assessing the impact of the high-rises on the urban fabric, visibility and dominance throughout the entire study area were evaluated. The high-rise buildings complement and enhance the skyline of the development and provide a nice architectural detail and form to the existing urban settings. Some of the buildings such as the NV buildings are landmark buildings: distinctive in form and detail both when viewed close-up or from a distance. Other such as The Heart was designed as background buildings that integrates and blends in with the fabric of the surrounding context by addressing its context and purpose. The distances between the high-rises are significant, except for the three NV buildings that generate one complex of high-rises (fig.2). It is vital to have reasonable distances between the buildings in connection with the amount of sun they receive, good views and undisturbed air-flow. A separation distance between adjacent towers that is close to the distance across a street (approximately 20 - 23 meters) is a viable and comfortable distance when primary living spaces, large windows and balconies are facing each other.

Fig. 2 Aerial view of the research area
One of the most important urban design questions is about the impact high-rises have on the urban infrastructure. To start with, higher urban densities are related to both longer work trip traveling and greater traffic congestion (Cox, 2012). Based on traffic flow concepts, traffic density estimation is defined as the number of vehicles per unit length of a road (e.g., vehicles per km, or vehicles per km per lane). In some researches vehicle density is defined as the number of vehicles in a certain area of a city, which is measured as vehicles/km² (Darwish and Bakar, 2015). It was not possible to actually measure this parameter but observation of the adjacent streets show no congestion or heavy traffic. Another important issue is the proximity to mass transport. Transit and high density living can be mutually supportive. The tram stop is just a plaza away from the Heart and NV buildings and there is also intense bus transport from the Quays to the city center. Overloaded transport, service and social infrastructure presents a more fundamental barrier to higher density housing and that exists in many places. Planners have realized that the necessary physical and community infrastructure must be provided and have planned for balanced, comprehensive development. Finally, pedestrian routes with pleasant canal views connect the different areas and function in the Quays. It is functional and gives the occupants the opportunity to enjoy the natural surroundings around the buildings, socialize and exercise.

2.4. Plazas characteristics

The buildings have limited open space around them suggesting that no new plazas can be introduced. The design of the connected plazas between The Heart, NV buildings and another one: by the Imperial point introduces many functions such as front of the buildings, transitional zone, lunch time relaxation, tram waiting, sidewalk café, but not space for exhibitions and performances.

![Fig. 3 (a) View of the NV buildings from the Heart Plaza (b) The Heart plaza landscaping](image-url)
comfortable distance. The plaza between NV buildings and the Heart is 160 meters long and 52 meters wide, and the plaza in front of the Imperial Point is slightly smaller. The sizes of the plaza support the infrastructural capacity of the area so there is no overcrowding. The design of the Heart plaza incorporates a wide variety of forms, colors, surface structures, sculptures, different seating, nooks and corners, trees and bushes but no changes in the level. The smaller Imperial point plaza has only changes in the textures and colors of the pavement.

Fig. 4 (a) The Heart Plaza  (b) The Imperial Point plaza

From both of the plazas complex view to a variety of buildings is possible and the design capitalizes on it with many formal and informal sittings orientations. The Heart plaza has been designed to accommodate lingerers and passer-through as the both functions has been provided with distinct subareas to avoid conflict. The Imperial Point plaza (Fig. 4b) is one united paved open space that does not encourage lingerers to spend time there. The plazas are welcoming people to take shortcuts, and barriers between sidewalk and plaza, including grade changes are eliminated. There are design elements such as furnishing, attractive focal points and defined edges that encourage people to stop and linger in the Heart plaza while the Imperial point plaza is simply paved space connecting buildings without elements that can accommodate peoples’ stay. Heart plaza addresses both the men’s predominant for a front yard public, interactive experience and also the women’s preference for a calm and safe backyard experience, while the Imperial Point square is just one big open public space without any subareas. The plazas are designed for heavy use minimizing the opportunities for vandalism. The Heart plaza is sited to receive maximum year-round sunshine but The Imperial Point is shaded by the adjacent buildings. If the summers are very hot, this may provide shelter from the sun, while in the NV building there are not any vegetation or canopies except for the near-by café to provide shades. However, as city policy, the building height, distances and mass are controlled to enhance sunlight to reach public open spaces. The wind in the plazas is minimal. The paving changes and the planting clearly define the plaza as a space distinct from the sidewalk, without visually or functionally define it inaccessible to passer-by. The two plazas has very different connection with its surroundings: while the Imperial Point is surrounded by buildings, the Heart plaza is exposed to the public infrastructure around it. The Heart plaza features has been extended into the public infrastructure to draw attention to the plaza while the Imperial Point plaza contains no plants or seating that can be used for the purpose. The visual and functional connections between the plazas and the surrounding buildings have been taken into consideration and the private space of both the plaza users and the building users has not been disregarded by placing benches, tables or desks in a small distance to windows and doors. The ground-level building uses animate the plazas, holding retail stores and cafes, instead of offices and
blank walls. On both plazas outdoor cafe in bright colors of the seating is available to draw people in. However, the plazas are not designed with a variety of nooks and corners to provide a choice of seating and viewing possibilities. The Imperial Point plaza has not been divided into subspaces, while the Heart plaza has been divided by paths for providing a variety of experimental uses for users. However, such features as grade changes, planting diversity and seating arrangements have not been used to create subareas. The subareas on Heart plaza has been separated from one another without creating in any of them a sense of isolations for the users. The subareas in the Heart plaza are large enough so users going into the area will not feel as intruding the privacy of people already there. The subareas are scaled so someone sitting there will not fell intimidated or alienated no matter is staying alone or in a group. Both plazas are designed to enhance existing circulation patterns. The plazas are linked by a system of safe pedestrian walkways, malls, bridges that encourage walking. A thought has been given to anticipating directly the routes between buildings and stops of the public transport that people will take when in a hurry. The plaza structure also permits unobstructed access to cafe and retail established marginally to the plaza; access to seating and viewing areas; opportunities for shortcuts or enjoyable walk-through. These features promote variety and usability which enhances the quality of the plazas and by addressing the needs of the users turns spaces into places which is a step towards sustainable urban design.

There is no observed desire to guide pedestrian movement with physical barriers such as walls, planters, bollards, distinct changes in levels and texture or also colors and patterns in paving which have been proven ineffective. The plaza design enhances the tendencies the pedestrians to walk in the center and the sitters to gravitate to the edges of spaces. The design accommodates the needs of disabled, the elderly, parents with prams and the vendors carts. The design recognizes the seating as the most important element in encouraging the Heart plaza use but this is not the case with the Imperial Point plaza. The NV seating meets the needs of the varying types of sitters commonly found in the most plazas. The seating location does not vary in sun exposure or shading, making it questionably useful in very hot or cool weather. The plazas does not reflect that the people who want to sit are commonly attracted to areas where they can see other people passing by. Secondary seating such as mounds of grass, steps with a view, retaining walls allowing sitting has not been incorporated on the plaza but the benches does not form a sea that might scare potential visitors when they are not densely populated. Some of the seating is linear (benches) and some is circular and looking out to permit visitors to be next to people they don’t know avoiding eye contact or interaction. Wide, backless benches, right-angle arrangements or movable chair and tables are not provided for the accommodation of groups. The seating is not taking the best possible advantage from the variety of sun and shade. However, planters and other design elements create a sense of privacy. A variety of seating orientations has been created to allow different views, distant views, views of entertainment, foliage views, views of passerby. The materials used for the benches are metal and stone, excluding materials that might seem warmer such as wood. Rich planting has been used to enliven the visitors’ perception of change in color, light, ground slope, smells, sounds, and textures. Where transparency to other subareas is needed, feathery-leafed, quasi-open trees have been introduced. Where wind is a problem, scattered trees have been planted to address potential problems related to dense foliage and high winds. A great selection of annuals, perennials, shrubs and trees has been put together for color and fragrance. In order to preserve desired views and to provide shades and maintenance, the eventual height and mass of the grown plants has been taken into consideration into the design process. Without compromising the sunlight to the windows of adjacent buildings, trees have been planted to provide a screen for the buildings. The planted areas are protected from damage coming from plaza users by providing adequate seating. There are wide enough walls suitable for seating to avoid visitors to seat in the planted areas. These features are related to the usability and functionality of the plazas and contribute to the overall sustainability of the arrangement.

A variation of lawns are introduced into the plaza’s that promote many casual activities such as picnicking, sleeping, reading, sunbathing, sprawling. However, no changes in levels or slopes are utilized to provide better seating and viewing possibilities. Changes in level, not even modest ones, have not been used to create subareas. They also have not been used to divide seating areas and circulation. Despite this, the character of the plazas is intimate in favor of small areas, avoiding a vast prairie feeling. Public art has been scarcely used missing an opportunity for creating
sense of joy and delight, promoting play and creativity and enhancing the communications among users. The existing art is easily accessible and can be touched and played with. The nature of the art is not elite allowing larger portion of the users to appreciate it. The sculptural elements used in the Heart plaza are scaled to the plaza itself. The sculpture is experiential; that is, can people sit around it, climb on it. It does not obstruct the circulation patterns and sight lines. The center of the plaza is free from public art thus avoiding to turn it into mere background for the sculptures. Visual attractions such as fountains are missing, but the vicinity is abundant with water features. The major circulation routes in the Heart plaza follow the plaza users’ principal “desire lines, while the Imperial Point plaza has no paths but one big paved space, where the movement lines are enhanced by lines of pavement. Following the design intent to direct pedestrian movement, a ground cover discouraging walking such as cobbles and large gravel has been applied. Without impeding entry, the transition from the sidewalk to the plaza has been signified by change in the pavement (Fig. 3). Indoor-outdoor café, food kiosk are adding functions to the plaza design. Users can eat bag-lunch or food from a vendor in one of the many comfortable informal seating.

However, facilities usually found in a restaurant such as drinking fountains, rest rooms, telephones are missing in the original plazas design. The trash containers distributed to avoid littering are not enough for the plazas sizes. The plaza’s features do not allow special events in the plaza, such as temporary exhibits, concerts and theatrical events. However, vendors are anticipated in the plaza design in order to add to the liveliness of the place, increase security and make the plazas more popular. Table 1 summarizes the plazas features.

| Table 1. Plazas features |
|-------------------------|
| **Formal seating** | **Informal seating** | **Pavement patterns** | **Planting** | **Changes in levels** | **Public art** | **Nukes and corners** | **Cafe** | **Restaurant** |
| The Heart plaza | • | • | • | • | • | • | • |
| The Imperial point plaza | • | • | • | • | • | • |

The numerous and diverse urban design features of the plazas increase the social and environmental sustainability of the development.

2.5. Discussion

The findings indicated that the development was created following basic urban design principles resulting in high-quality buildings and surroundings. The architecture of the high-rises is memorable and prominent, evoking civic pride and enhancing social sustainability by empowering the residents to form healthy and liveable community. The social dimensions of sustainability relate to the quality and quantity of personal residential space as well as the quality and quantity of communal spaces. (Ng and Wong, 2004). Quality public spaces are major factors for the social and economic life of the communities. The public spaces of high-rise complexes are crucial for realizing social interactions and recognition (Gärling and Golledge, 1989). They are particularly important as places where people can experience their culture and identity and enjoy diversity. Altogether there are nine indicators of quality of public spaces. Salford Quays common areas are accessible; easy to enter and move through; they are attractive; they please visually the users; they are comfortable: designed to give pleasure while used; they are inclusive: welcoming different users; they are vital and viable: their social function is well exercised; they are functional: they perform
well in accordance to their multiple purposes; they are distinctive: the spaces have their explicit character; they are safe and secure; they are robust: functioning well against the challenges of everyday use. They promote better public health and more frequent and meaningful interactions, thus providing high-quality sustainable public realm.

The study of the facilities and the functions revealed great diversity and richness of the urban settings promoting active usage of the limited quays space. There are shops and restaurants, cultural amenities (galleries, cinemas and a museum), parks, plazas and squares, pedestrian paths along the channels. Studies on viability of high-rise developments show that special attention must be paid to the activity facilities and open space in the high-rise living environment (Wang and Chien, 1998). These functions are complementing the living space of the residents, acting as an addition to the limited functions of the flat, enhancing livability and promoting healthy lifestyle. Actually it is found that residents value places that are not significant, large and remote, but familiar and close to their homes (Burgess et al., 1988). Each of the public spaces plays a specific role in the positive experience of the residents. Neighborhood parks offer recreational facilities and amenity to a close circle of residents and improve the environmental quality and quality of life (Jim and Chen, 2010). Squares and plazas enable social interactions and public life. Cultural amenities enrich the life of the residents and visitors. However one opportunity has been missed in the design intent: the ground floor of the high-rises does not accommodate functions other than the residential which could add vitality and diversity to the urban settings. Sustainable development also encompasses facilities addressing the need of children to exercise high-mobility without guardian and proactively plan for child friendly environment. Playing outside helps children develop physical strength, coordination and balance. It is important for their social skills, when playing and learning to communicate with other children, share, collaborate and interact with others. It enhances their imagination and creativity, thinking and problem solving skills, sense of connection and learning to stay safe. However, facilities for children play are not found in the vicinity, though this function can be attributed to the parks and the paths along the quays.

A great diversity and mix of uses has been experienced in the area. Recreational facilities and water features work together for healthier, more interesting lifestyle of the residents. The type of the housing also varies: low-rises are coexisting with the high-rises, relieving the harshness of the urban skyline and acting as a buffer for urban noise (Seik, 2001). Business (Media City) and residential uses has been brought together. As a result of the high-rises increases the intensity of the usage of land making it more efficient. High-rise buildings present landmark effect and increase the city brand value. Diverse use of land also impede decline and can sustain night activities to support the local economy (Shin, 2010).

It has been found that the development has a great infrastructural capacity. For example other high-rise buildings in Manchester such as Beetham Tower, 17 New Wakefield Street, Great Northern Tower and Britton House are situated directly on the street without any amenities to comfort the users of the place. Salford Quays high-rises have the advantage of residential function supported by comprehensive, robust infrastructure for pedestrians and vehicles, with well-established public transport. This arrangement has great sustainability potential. Doughty and Hammond (2004) state that a cluster of high-density buildings, with well-integrated network of infrastructures and transportation systems, can influence positively the energy efficiency of cities and reduce their impact on the environment. There is great balance between the buildings and the surrounding infrastructure giving the opportunity enough public space to be preserved to sustain high quality of the external environment (Fenga and Xingkuamb, 2011).

The paper analyses a successfully functioning urban redevelopment and reveals what are the elements empowering the design, so the reader understands better the design process and use the article as a guidance and inspiration. The research can inform architects, urban designers and planners on the successful practices and their outcomes when designing new parts of the city as a mixed use, high density development. Altogether seven steps have been identified in order to inform the future designer’s work:
1. The design should address the psychological strain from living separated from natural environment by high-quality green settings around the high-rise buildings. Vertical landscaping is another vital option that has been underused in the researched buildings.

2. Architects and designers should consider proper integration of the high-rise buildings with their surroundings so there to be a right mix of residential, recreational and commercial facilities that enhance the social sustainability of the place, thus a combination of living, working and leisure activities to be available in a walking distance.

3. The benefits of landmark buildings and rich skyline must be recognized and the potential of the high-rise buildings to visually and functionally enrich their context must be implemented in vibrant, recognizable design.

4. High-rise developments should meet the people’s need of children playgrounds and quiet natural settings for the elderly in order to sustain social integration.

5. Vibrant urban infrastructure such as walkways, streets and plazas along with proximity to public transport need to be combined in order to support the higher density caused by the high-rise development.

6. Interesting pedestrian and cyclists’ infrastructure should be provided in order to increase the liveability of the development.

7. Plazas with the sustainable characteristics demonstrated in the design of the Heart plaza and the Imperial Point plaza must be created in order to provoke social interactions and sustain recreational everyday activities.

3. Conclusion

An observation of nine high-rise buildings was conducted and their immediate surroundings were examined. The observation has followed a template by Marcus, Francis and Russell (1998) and a structured questionnaire to elicit an analysis of the qualities of the urban design of the regeneration area in connection with the high-rise buildings and their amenities. The research indicated some current challenges to urban regeneration both as a concept and a policy field, such as investment in public art, creation of plazas encouraging social events and including the bases of the high-rise buildings into the existing urban fabric set of functions. However, the results show that the public realm is with good quality, following certain design principles that produce vivid and lively environment. The external qualities of the buildings such as appearance and integration into the urban context are also satisfactory: the buildings fit well into their surroundings and have a pleasant appearance that makes them important landmark or background buildings. There are numerous amenities such as cinema, gallery, museum, etc. dispersed in the study area which increases the social value of the development. It has been found that the infrastructural capacity is sufficient to meet the population density without creating traffic congestion and overcrowding. Finally, there is diversity and mix of uses and public spaces.

The study has not involve research of the indoor environment quality of the buildings, and occupants point of view is also omitted, which leaves a material for future research, since these approaches are important in determining the overall sustainability of the buildings and their context.

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