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Developing Urban Environment of Residential Areas, Makkah City, Saudi Arabia, Case Study: Khansah Residential Area

Dr. Magdy M. El-Bastawisy

Associate Professor, Department of Islamic Architecture, Umm Al-Qura University, Saudi Arabia

1. Abstract:

The main concern of this paper is developing urban environment of residential areas, Makkah city, Saudi Arabia, by promoting sustainable human settlement approach. Makkah, with its special function as a Holly city and topographic character, lacks natural resources such as water and agricultural land; and suffers from the phenomena of rapid urban growth. Thus, the investigation of the main factors affect its urban growth is used to define the urban profile of Makkah city. To identify the environmental impact of the rapid urban growth on the residential areas and Makkah city; a case study of a residential area called Khansah was selected and, accordingly, a survey and questionnaire were conducted. The results provide evidences that Khansah suffers from high environmental decline of natural and socio-economic living conditions. At the same time, developing policies provided for residential areas in Makkah are mainly concerned either with physical development or full replacement of buildings rather than environmental development. This situation, therefore, requires accelerating sustainable development for Khansah. Sustainable human settlement development, within this context, could be beneficial because it refocuses attention on the ultimate objective of development, increasing the opportunities for people to lead productive and satisfying lives. Concepts and definitions of sustainable human settlement development are also investigated to define its capabilities in developing the urban environment of Khansah and Makkah city. Finally, development objectives, criteria, and guidelines were outlined for achieving the sustainable human settlement development in Khansah and Makkah city.

2. Key Words:

Sustainable Human Settlement, Residential Areas, Urban Profile and Planning, Physical Development, Spatial Planning, Makkah City, Saudi Arabia.

3. Introduction

Over the past four decades, one striking outgrowth of Saudi development has been the rapid migration of population to urban areas. With increasing numbers of people moving to cities and towns, the pattern of urban areas has been changing rapidly in Saudi Arabia. Makkah, e.g., as the third largest city in Saudi Arabia, had about 0.367 m residents in 1394 H. In 1407, the population size of Makkah was more than doubled by getting 0.742 m. By 1413 and 1425 H, the population size of Makkah has increased to 0.957 and 1.385 m. The rates of population growth of Makkah, during the periods of 1394-1407, 1407-1413, 1394-1413, and 1413 (1991)-1425 H (2004); are 102, 29, 159 and 44.7 % relatively. The average annual rate of growth is 3.7% during the period of 1413-1425 H. Moreover, the size of urban area of Makkah was 1112 hectare in 1394 H. In 1407, the size of urban area had increased four times to 5526 hectare. In 1424 (2003), the size of urban area of Makkah city reached 15159.3 Hectare. The factors, stand behind the rapid growth of the Saudi urban centers, are mainly rural-urban and international migration.

This rapid urban growth in Saudi Arabia has greatly improved the economics of the informal sector and in many towns micro and small businesses are thriving. The informal sector takes different forms; including bottle collecting, street vending, water bottles selling, car washing, etc. This trend of rapid urban population growth and expansion of Saudi cities has also added environmental and health issues in

residential areas such as overcrowding, lack of sufficient water supply, unhygienic living conditions, air and noise pollution, waste management, slums and shanty houses, etc. Overcrowded houses, and inadequate sanitation causing contamination of air, soil, and portable and underground water have led to outbreak of diseases. Western architecture, international style and post modern architecture are also interacting with traditional buildings.

Makkah has problems of lack of suitable public transport and sufficient quantity of private cars; and lack of public spaces and gardens that put more pressure on air pollution and energy consumption. In Makkah, there is also a considerable strain on the traditional social value systems developed over centuries and continued to serve well in rural areas, but in urban settlements family systems are breaking down. The social disruption caused by the division of families between urban and rural areas and the loss of traditional have contributed to higher levels of divorce and a rise in domestic violence.

Within this process, the environmental issues are not usually considered while preparing master or budget plans to produce well coordinated and balanced development at planning stage. Thus, these issues cannot just be solved by pollution control measures, providing sewage treatment facilities etc. The best use of land needs must be assessed in terms of environmental and socio-economic aspects. The spatial planning tools, moreover, can help in sustainable development. There is a need to study the necessity of structural changes in cities and to introduce planning approaches that can help in achieving environmental compatibility. Sustainable development, as a result, could be one of the most suitable approaches for rapid urban growth in Makkah city. This is because the principles of sustainable approaches include parameters such as conservation of land resources, functions and integrity; management and conservation of cultural diversity; empowerment of local people; valuation of indigenous knowledge and culture of local inhabitants, attain equity and environmental justice to all stakeholders and value human health.

3. 1. Purpose and Methodology

The purpose of this paper is to develop urban environment of residential areas in Makkah city, Saudi Arabia, through promoting the concept of sustainable human settlement approach; which incorporates environmental aspects into land-use and physical planning; and recommend environmental management plan for improving environmental quality of residential areas in Makkah. To achieve this purpose, it is proposed to initially analyze sustainability and sustainable human settlement development: concept, definitions, principles, methods and capabilities in decreasing environmental impacts of economic development. Second, review international experiences which have employed the concept of sustainable development for developing residential areas. Third, outline the urban profile of Makkah city. Fourth, define the environmental and planning issues associated with the rapid growth of a residential area, as a case study. Fifth, assess development potentials and constraints of the case study. Finally, define development objectives, outline criteria and propose guidelines for achieving environmental compatible land use and management plan in residential areas, Makkah city.

To define the planning and environmental issues of the residential areas in Makkah city, the analysis of the study is based on the collection of first and second data and information of a selected case study of a residential area called Khansah. A site survey and a questionnaire were conducted in Khansah in 1427 H (2006), which includes data collection of existing urban, services, infrastructure and socio-economic conditions and profiles.

4. Background

4. 1. Environment and Sustainability

Environment refers to resources provided by nature, different from human beings, with emphasis on human use and values of natural resources, e.g., water, air, soil, etc.

Sustainability general definition was created by the World Commission of the Environment and Development (1987) as an intergenerational equity: ".sustainability requires that the needs of the present

be met without compromising the ability of future generations to meet their needs". It argues that sustainability is a process "of change in which the exploitation of resources, the direction of investment, the orientation of technological development, and institutional change are made consistent with future as well as present needs".

The United Nations Conference on Environment and Development, Rio de Janeiro in 1992, included further principles of sustainable development such as: promoting equity in participation in sustainable development; minimizing the adverse environmental impacts of economic development by integrating environmental considerations with economic and sectoral planning and policies; and formulating resource use and development planning policies; which are relevant to the management of urban growth.

4. 2. Concept of Sustainable Human Settlements Development

The international movement towards the concept of sustainable development has encouraged other sectors of national and international development to view the issues of sustainability in their particular spheres. The United Nations Centre for Human Settlements (Habitat) (UNCHS) in 1990 deeply explored the concept of sustainable human settlements, which became enshrined in an international program through the inclusion of human settlements in Agenda 21. The socio-economic and environmental problems found in the South Pacific cities make it imperative to define the parameters for sustainable patterns of urban management.

In 1994, UNDP has explored the concept of sustainable human development, which seeks to refocus attention on the ultimate objective of development, increasing the opportunities for people to lead productive and satisfying lives. This implies assessing development in terms of a range of socio-economic indicators rather than just income growth. This approach is captured in the concept of human development which is assessed by UNDP through the compilation of the human development index (HDI) for each country. The index is based on a range of socio-economic indicators such as life expectancy at birth, child mortality, adult literacy, access to safe water and health services, and employment and wages. Sustainable human settlements development is essential to sustainable development via intensifying efforts and cooperation to improve living conditions in cities, towns, villages and rural areas. The Habitat II conference (UNCHS) in 1997 has elaborated on the various aspects of sustainable human settlements management in an urbanizing world and these, together with recommendations for adequate shelter for all, are contained in the Habitat Agenda.

The overall sustainable human settlement objective, accordingly, is to improve the social, economic and environmental quality of human settlements and the living and working environments of all people, particularly urban and rural poor. This improvement should be based on technical cooperation activities, partnerships among public, private and community sectors and participation in the decision-making process by community groups. These approaches should form the core principles of national settlement strategies, which will need to set priorities in accordance with national plans and objectives, taking fully into account social and cultural capabilities.

5. International Experience of Sustainable Settlement Development

Different countries have adapted sustainable development for their settlements or residential areas at the local, regional and national levels. The experiences of these countries comprise several international cases of similar environmental, planning and socio-economic issues, characteristics and potentials of Khansah residential area and Makkah city. Therefore, different international experiences were investigated such as Cairo, Egypt; Jordan; and Fiji, South Pacific cities.

5. 1. Egyptian Experience: Since 1974, the Egyptian government with association of international governmental and non-governmental organizations launched different kinds of developing programs for improving the environment of informal areas and slums. The development concentrated mainly in several locations in and around Cairo. By 1981, the Mega-Cities Host Institution was primarily concerned with

the promotion of economic development. It encouraged initiatives that improve people's standard of living while preserving, replenishing, and even revitalizing the area's cultural and natural resources of informal areas.

The above efforts followed by extension of physical development policy for the same areas, which initiated in 1992. Moreover, the government constructed basic infrastructure and facilities, including piped water, electricity, sewerage networks, paved roads, primary schools and health centers. In 1997, the Sustainable Livelihood Approach SLA was explored, with alternative strategies for urban poverty reduction through integrating the most use of slums assets in an environmental development concept. SLA encouraged communities to look at their assets in an integrated way, using complementary capital including, physical, social, economic or natural in an efficient and effective way to safeguard the interests of current and future generations. It also provided a framework for the development of measures and indicators to monitor improvements in livelihoods systems of the urban poor and the extent to which these are sustainable.

In 1997, the government also initiated a project for the Rehabilitation and Upgrading of Slums to coordinate efforts with the above mentioned organizations. The project consists of nine phases: establishing 70,000 housing units; relocating a percentage of inhabitants into another planned community equipped with all services and amenities; and rehabilitating and upgrading existing slums. With the completion of this project, slums will be fully equipped with piped networks of water supply and sanitation, roads network, open space, vocational training and healthcare centers, libraries, schools, phone service network, and environment friendly crafts workshops.

5. 2. Jordanian Experience: In Jordan, one of the most important key positions for urban environment is Housing and Urban Development Corporation (HUDC). The corporation has put a number of convincing ideas to resolve the problems related to the housing and environmental management in the country. These ideas are based on decentralization of power, localization of decision making and participation of the people to share responsibilities. The Corporation, for future development, focused on local authorities such as municipalities and rural communities to take their duty to control and build their habitat by themselves. The HUDC, as the facilitator, reformed Housing Policy in Jordan based on creating partnership with the private sector; and initiated an Evaluation Directorate, whereby studies and research are done to give and recommend to the government the information and strategies affecting the sector, including the implementation of the National Housing Strategy (NHS).

The HUDC has also been working on a set of indicators representing the housing and urban sector, reflecting the actual situation as a tool for laying the right strategies. The National Housing Strategy (NHS), adopted in 1988, was mainly directed towards the guided private sector. It tackled the following: access to appropriate residential land; housing finance for lower income households; building technologies and construction industry; shelter sector subsidies and their targeting; contributions of different housing delivery systems; and institutional framework. To implement these ideas both governmental and non governmental organizations consider that Mass Media is the main partner to motivate people awareness, desire and requirement for better future. A cooperative founded by media and press people who are interested in the development process. It works mainly on building trust and understanding between the citizen and decision maker, where they are allowed to participate in what formulates their life and their society.

5. 3. Fiji Experience, South Pacific: The practice of physical planning in the South Pacific is most advanced in Fiji, where the first batch of local authority planning schemes was approved in the early 1960s. Many local authorities have had extensive experience in this area, including: preparing a provisional planning scheme, holding public exhibitions and resolving objections and appeals; obtaining legal approval of the planning scheme from the national authority; implementing a process of statutory approvals for all land subdivision, building physical development; and undergoing a process of revising a planning scheme when the situation requires.

Over time, various aspects of environmental management have been incorporated with the land use aspects in the local authority planning schemes. Although the planning schemes have had the effect of placing limits on the development wishes of some landowners, they have come to be accepted by the public as large as essential tools for efficient development of the built environment.

Over four decades of planning practice in Fiji, the public has seen the benefits through improvements in infrastructure and preservation of sound residential environments. The planning process has also raised the level of awareness among members of public, social, economic and environmental effects of different types of urban development and has increased people's capacity to take advantage of the opportunities for public participation in the process of preparing a plan for the future development of their physical environment. The current processes include structure planning linked with investments in infrastructure and social services, as well as development control. The practice of physical planning has also helped to develop the capacity of local governments in the overall process of urban governance.

6. Urban Profile of Makkah city

Makkah is the third largest city in Saudi Arabia after Riyadh (the capital) and Jeddah. It is the capital of Makkah province located to the west of the Kingdom. Makkah city is the second largest city in its province. It accounts 21.5% of the total population size of Makkah province in 1413 H. The growth of Makkah, and in turn its residential areas, has a long history rooted in hundreds of years of the city serving as a focal point for trade, pilgrims and visitors. Different factors, in fact, affect the growth and pattern of residential areas in Makkah city; in terms of population and urban sizes; such as city function, topography, climate, economic, etc.

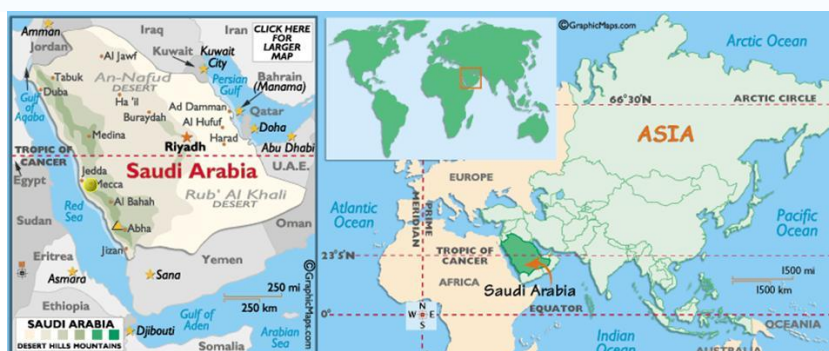


Figure 1: Location Map of Makkah

6. 1. Factors of Urban Growth

6. 1. 1. Function of Makkah: the special function of the city as the holiest city on the earth for Muslims turned it the destination of millions of pilgrims and visitors. Recently, about two to three million have gathered for the major pilgrimage, and many more perform the minor pilgrimage (Umrah), which could be performed at any time of year. The number of pilgrims participating in the Hajj and Umrah has also dramatically increased all year-round as the result of convenience and affordability of jet travel. Thus, many of Saudis are employed to oversee the Hajj, staff hospitals, hotels and shops that cater to pilgrims.

Makkah city also provide a considerable educational service, particularly higher education. It hosts the University of Umm Al-Qura and other educational institutes. Makkah enjoys additional economic bases such as trade, industry, construction and real-estate. Makkah, therefore, has been targeted for national and international migration. This trend has increased the rates of population growth, and demand for housing and services; and, in turn, uncontrolled urban expansion.

6. 1 .2. Natural Characteristics: the natural characteristics of Makkah are remarkable. Makkah is located at the intersection of latitude 21-25 degree north and longitude 39-49 degree east. Makkah lies

inland, 73 km east of the Red Sea, Figure 1; which consists of rugged, rocky (predominantly granite) terrain, with mountain ranges on three sides (south, west and east), which constitute about 53% of the total area of Makkah. Makkah is 277 meters above sea level. Extreme heat and aridity are characteristics of Makkah. Makkah midday summer temperatures, June through August, can soar to 43-45°C. The average winter temperature range is from 11°-29°C. The average rainfall in Makkah is about 25-270 ml/year. Strong floods may strike the city once every few years. As a result, Makkah with its topographic character lacks natural resources such as water and agricultural land. The landscape of the city, in addition, has a significant impact on the growth and pattern of the residential areas.

6. 1. 3. The Holy Mosque: the growth of Makkah, historically speaking, has always a strong relation with the Holy Mosque that always has a major impact on its physical growth. Makkah physical growth originally had been around the Holy Mosque for a long time. The city was small of traditional pattern and close to the Holy Mosque, including small open spaces, and narrow streets.

6. 1. 4. Formal Planning Development: During the last few decades, moreover, five main stages have affected the growth of Makkah city as follows. **The first stage**, starting of preliminary formal planning, witnessed importing of foreigners labors and technicians, new architectural forms and styles that contradict with the local environment; and expansion to the west, east and south including establishment of new districts.

The second stage started in 1413 H (1991) with conducting practical socio-economic studies as the base for the first formal master plan of Makkah city such as: the Regional Development Plan; absorbing projected population growth and 2.0 millions of Holy Mosque visitors, including compromising transportation, accommodation, services and infrastructure of the area around the Holy Mosque (called later the Central Area) to avoid congestion; orienting the city physical growth to the south and east on the flat topographic areas; with limiting building heights.

During the **third stage**, 1401-1411 H, the first Master Plan of Makkah had been conducted, including land-use and transportation strategies. The population size of Makkah estimated at 950,000; which expected to reflect on the demand for urban services such as education, health, facilities, infrastructure, etc.

The fourth stage, 1412-1417 H, witnessed the preparation of the long term development strategy for the city. It expected that the population size would reach 1.25 million and related required physical expansion.

The fifth stage, 1418-present, the development plan for Makkah estimated the population size of 1.375 million in 1424 H, established the Higher Commission for the Development of Makkah Province mainly for the development of the Central Area, enhanced the long term development strategies for the city until 1450 H, and permitted investors to establish mega projects such as transportation; services and residential mainly in the Central Area around the Holy Mosque such as Jabal Omar, King Abd-Al-Aziz Wakf, Jabal Khandamah, Shamiah Area and King Abd-Al-Aziz Parallel Road, with development strategies of replacing existing buildings, local people, services and infrastructure; with full new physical patterns and types for pilgrims and visitors.

The master plan also estimated population size of Makkah by 1450 of 2.9 million, the size of the pilgrims of 3.9 m, and 4.2 m visitors for Umrah. In 1424 H, land-use map of Makkah includes total built up area of 15159.3 hectares (151.6 sq km), with 39.9% housing, 0.7% hotels located mainly in the Central Area, 6.56% commercial and mixed of housing-commercial which shows that trade is one of the major functions of Makkah, 6.3% services which is small comparing to the role of the city, 3.3% industry, 2.1 storage, 16.9% transportation system; 21.4% holly and pilgrims areas including Arafat, Menna and Mozdalfa; and 1.13% for recreational which is quite small compared to planning standards.

6. 2. Urban Patterns of Makkah City

The above mentioned factors of Makkah city has reflected on its urban profile. The Higher Commission for the Development of Makkah Province has defined the urban pattern of Makkah city, which could be summarized in three main types, Figure 2. These types encompass three main different urban patterns: traditional, transitional and new urban pattern.

6. 2. 1. Traditional Urban Pattern: The area of traditional pattern (the historical area) is located around the Holly Mosque and within the first ring road (the Central Area). This area represents the origin of the city which characterized by traditional organic with narrow tilted streets. It also includes traditional urban area located on main roads and streets that pass the Central Area. Its pattern includes main streets with traditional organic internal roads, high rise buildings as a result of the high value of its land. The Central Area always faces rapid and massive changes, in terms of the physical pattern, architectural styles, and population size and kind, as a result of its socio-economic dynamics and evolution.

6. 2. 2. Transitional Urban Pattern: The area of transitional pattern describes the patterns which started to take place during the period of 1375-1424 H. It is mainly located in the valleys of Makkah mountains, on flat and/or rugged landscape around the Central Area Its pattern is traditional unshaped compacted or/and scattered patterns which does not match the landscape. This area has no main vehicles access roads or streets. Its streets are narrow and unshaped.

This type was affected by uncontrolled rapid population and physical growth as the result of the migration to Makkah city, which resulted with low standards of urban environment. The population size of these residential areas is almost half of population size of Makkah city. Figure 3 shows the location, size and the magnitude of these residential areas comparing to the rest of Makkah city, which provides a strong evidence of the importance of developing these residential areas.

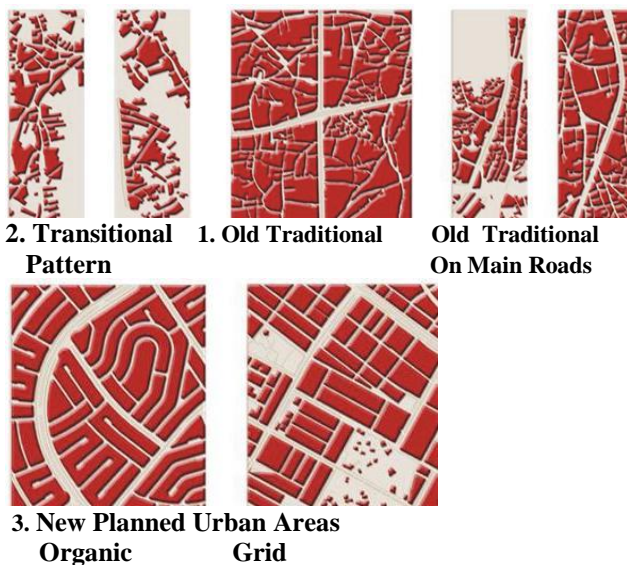


Figure 2: Urban Patterns of Makkah City

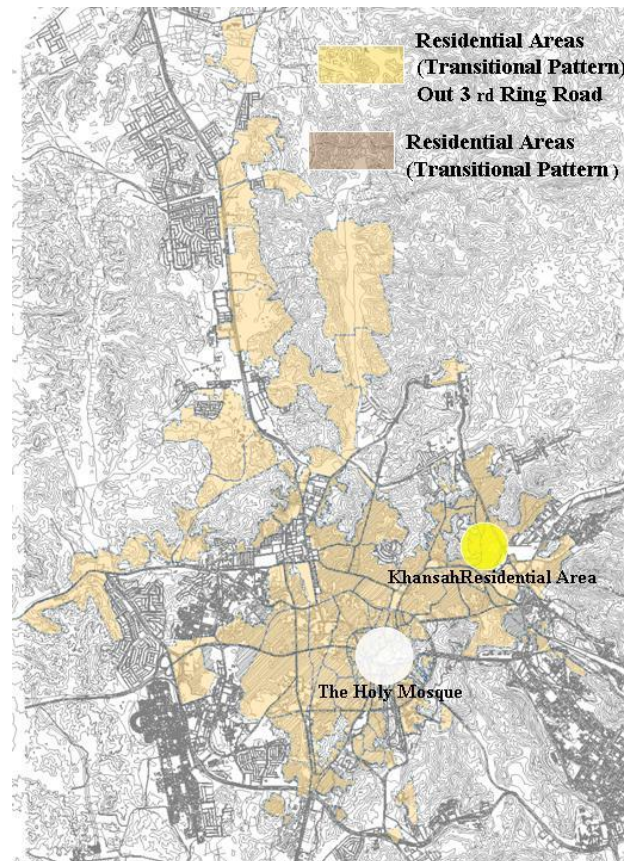


Figure 3: Transitional and New Patterns in Makkah

6. 2. 3. New Urban Pattern: The establishment of the new urban pattern started in 1375 H with the implementation of the new plan of Makkah. Its pattern is mainly grid, which does not consider its landscape pattern, with wide roads and streets. It is located in the skirting areas of the built up area of the city such as Al-Eskan, Al-Resafah, Al-Awail, Al-Nasim, Batthae Qurish, etc. Although the development of this area started with immature planning with grid pattern, which lack urban services and infrastructure; currently, it represents residential areas with well services and infrastructure. This type dominates the other types, in terms of size, location and distribution. It constitutes about 67% of the total urban area of Makkah city, although most of its residential areas have not yet fully developed.

7. Urban Profile of Khansah Residential Area:

7. 1. Location and Environmental Characteristics:

Khansah, as a case study, is located about 3 km to the northeast of the Holy Mosque, Figure 3, with total land size of 358,664 m² and population size of 12975, in 1427 H (2006). It is surrounded by two main streets, Hajj and Obteh. The topographic pattern is described as mix of mountain with rugged landscape. The mountain is located in eastern middle part and extends to the north and south of Khansah, with maximum elevation level of 90 m. The mountain area is about 47% of the total area, which left without any development as a result of its slopes 30-60 degrees, Figures 4, 5 and 6. The built-up area of Khansah is located mainly on the rugged landscape, with total area of 190,620 m², about 53% of the total land.

7. 2. Urban Profile:

The urban profile could be described as unshaped and compacted mismatched masses of low standards informal buildings and patterns, Figures 4, 5, 6 and 7. The residential area is served with a street system of low standards of quality and high capacity of cars and pedestrian. The pattern of the street system is unshaped with dead ends and without enough parking spaces. The pattern of the streets differ so widely, in terms of width, pattern, slopes that it can not facilitate traffic movements. Most of the streets end with unshaped steps; and left unpaved and without street lights and curbs. The entrances of the Khansah are not clear and narrow. The street system of the residential area significantly affects the traffic in and around the residential area. The traffic is typed with overcrowded on the main streets and jam within the residential area, particularly during the rush hours of weekdays, and seasons of Hajj and Umrah. The fire and emergency cars have no access to all streets.

The urban fabric is widely influenced by the topographic character of the residential area and location close to Holly Mosque. It consists of two main areas: built-up and empty. Within the built up area, the urban fabric could be described as unshaped mass of buildings that contradicts with the landscape. The urban fabric is typed with a mix of linear, compacted and scattered patterns. The sizes of the built-up area and open spaces, mainly vacant plots, are 89 and 11 % of the total of the built-up area, Figures 6 and 7.

The buildings are mainly in poor conditions with uncertain architectural style and built with uncommon collection of construction materials such as brick, paint, metal, wood, etc. 67.8% of the total number of buildings is in a poor construction and finishing condition, and 15.3 and 16.9% are of good and average condition of buildings. Most of the buildings are old, including 69.5% of the total number of buildings is above 30 years old, 25.5 and 6% are between 16- 30 and 1-15 years old. Most of the buildings are of 1-4 floors, with about 97.9% of the total number of buildings. 1.9% is of 5-10 floors and 2% are above 11 floors. The old, and low condition and rise buildings are located mainly in the internal parts of the Khansah, while the medium and high rises with good and medium condition buildings are located on the peripheral of the residential area, particularly in the east and south east part of the residential area because it is the closest part to the Holly Mosque, Table 1 and Figure 6. This trend leads to increasing pressures on streets, services and infrastructure. The urban profile, in fact, reflects images of slums.

7. 2. 1. Population Density: The gross population density is 360 person/ hectare and the net population density, in the built-up area, is 649 person/ hectare. The gross population density differs within the Khansah. It is found higher in the north part, then in the middle rather than the south part. The average

population density of Khansah is quite high comparing to the average density of Makkah city, which is about 101 person/ hectare in 1425 H. Population density is affected by different variables. The average family size in Makkah is high; about 5.75 in 1425 H. Few families may occupy a residential unit because they are foreigner with low income. The pattern of the urban fabric as compacted has increased the built density. The location of the Khansah nearby the Holly Mosque has also attracted population. The area is not fully accessible as a result of its topographic pattern, which make it a suitable place for illegal living and informal activities; and, in turn, crimes.



Figure 4: Photos of Transitional Pattern

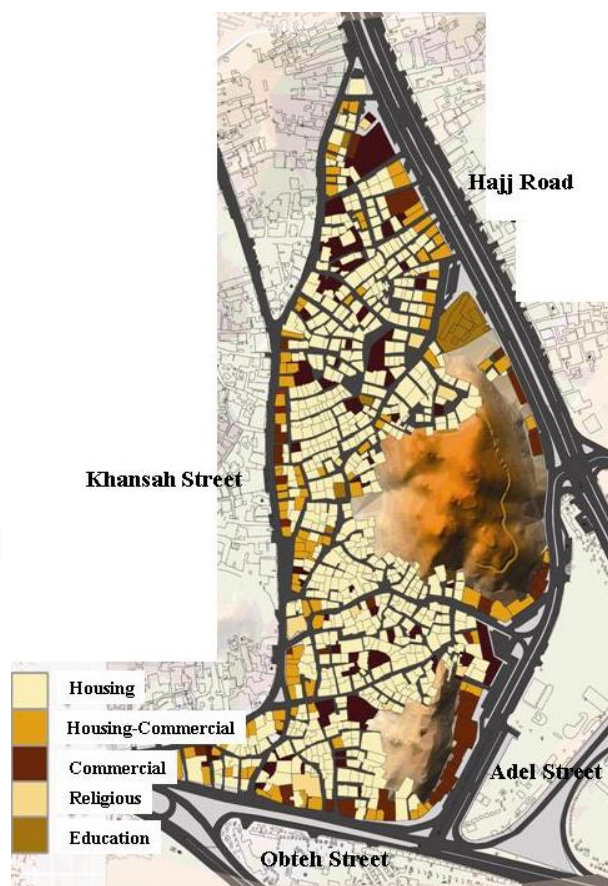


Figure 5: Land-Use Map of Khansah

7. 2. 2. Land-use: The land-use of Khansah could be described as mainly residential. The percentage of the residential use is about 63 of the total built-up area. The percentages of the other land-use are 18, 7.0, 2.0, 1.0 and 9.0% for residential-commercial, commercial, religious, education, and vacant plots relatively, Table 1. The commercial services are located on main streets. Grouping of commercial activities causes traffic jams as a result of the lack of car parking areas, which, in turn lead to environmental pollution. The vacant plots are a result of demolished buildings, which left without development. They are currently used for organic and solid waste dump, car parking or/and rain water collectors, which have direct impact on human health, Figures 5, 7 and 8.

Although the Khansah residential area enjoys religious, educational and commercial services; the quality of these services is not suitable, in terms of size and quality of buildings; and distribution within the area. The religious services are local and Jomah mosques, including 11 local and 3 Jomah mosques. Considerable portions of Khansah residences depend on educational services of other residential areas as a result of the shortage of its educational services. The educational services include a kinden garden, a primary school for boys, and 2 middle schools, one for boys and the other for girls. Most of these school buildings are rented, with low standards construction conditions. The Khansah residential area does not include any health services, Figure 5.



Figure 6: Building Heights, and Topographic and Urban Pattern of Khansah



Figure 7: Urban Pattern of Khansah



Figure 8: Visual Analysis of Khansah

Table 1: Urban Profile (Survey Results) of the Residential Areas

Urban Profile	Khansah	Urban Profile	Khansah
2. Area	358,664 m ²	12. Building Heights	
3. Built-up Area, with vacant plots	190,620 m ²	1-4	97.9 %
4. Population Size	12,975	5-10	01.9 %
5. Population Density		11+	00.2 %
Gross Density	360 p/ Hectare	13- Building Age	
Net Density	649 p/ Hectare	1-15	06.0 %
6. Topography	Rug/Mountain	16-25	25.5 %
7. Number of Plots	874	26+	69.5 %
8. Number of Buildings	799	14- Building Type	
9. Land-use		New	13.5 %
Residential	63.0 %	Old	86.5 %
Residential/Commercial	18.0 %	15- Services:	
Commercial	07.0 %	Mosques: Local	5
Mosques	02.0 %	Jomah	2
Education	01.0 %	Education: Kinden Garden	1
Vacant Plots	09.0 %	Primary Boys	1
10. Building Conditions		Primary Girls	1
Good	15.3 %	Middle Boys	1
Average	16.9 %	Health: Clinics, Hospitals, ..	--
Poor	67.8 %	16. Building Kinds	
11. Structure System		Villa (Private)	00.3 %
Skelton	88.6 %	Apartment Buildings	86.7 %
Wall Bearing	10.3 %	Shanty (Low Standards)	04.5 %
Others	1.1 %	Others (Commercial, Mosque,	08.5 %

7. 2. 3. Infrastructure: All the field survey and data collected from the municipality show that Khansah enjoys infrastructure supplies, including electricity and telephone networks; except the sewage disposal and portable water networks which are partially supplied. The questionnaire indicates that residences of the Khansah have different point of views regarding the efficiency of the infrastructure within the residential area. 43, 74, 42 and 22 are not satisfied with the portable water, sewage disposal, telephone and electrical services relatively, comparing to 33, 10, 35 and 22 are satisfied of the same services, Table 2. Satisfaction of the services, in fact, depends mainly on the location within the residential area because people lives on higher elevation levels do not have portable water supply and sewage disposal. The infrastructure networks are old, with low standards and quality, especially the networks of the portable water, telephone and sewage disposal. These networks are usually broken or leaking and need fast repair. The lack of sewerage network in some parts of Khansah has resulted in a proliferation of septic tanks or pit latrines. The electricity power is also down once in a while.

7. 2. 4. Socio-economic Profile

The results of the questionnaire defined that most of the residence of Khansah are Saudis of about 81% and the rest 19% are foreigners. The nationality of the foreigners is a mix of Indian, Pakistanis and Indonesians. The survey defined that the monthly family income of the Khansah is very low, which is a reasonable indicator for describing its socio-economic condition. The percentages of the monthly income are 30.3, 32.5, 20.9, 11.6 and 4.7% of the total population are of less than 1000; from 1001-2000; 2001-3000; 3001-5000 and 5001-10000 Saudi Riyal relatively. Their educational level could be described as low. 13% are illiterate, while 17% just can read and write, and 9 and 10% are graduated from primary and middle schools. The percentages of graduated with other educational levels include 29 for secondary, 5 for technical and 17 for higher education. Since most of the residences are Saudis, the percentage of house ownership is quite high of 72% of the total number of population. The rest of 28% rent their residential units. Comparing to the monthly income, the percentages of the car ownership is much higher.

The percentages of the car ownership of the total population are 69.8% own private car, 23.3% own or rent taxis, 4.6% own motorcycles or bicycles and 2.3% own no transportation means, Table 2.

Table 2: Socio-Economic Profile of the Residential Areas (Questionnaire Results)

Urban Profile	Khansah	Urban Profile	Khansah
1. Nationality: Saudi	81.0 %	4. Home Ownership	
Non-Saudi	19.0 %	Own	72.0 %
2. Educational Level:		Rent	28.0 %
Literate	17.0 %	5. Home Satisfaction	
Illiterate	13.0 %	Satisfied	70.0 %
Primary	09.0 %	Unsatisfied	30.0 %
Middle	10.0 %	6. Car Ownership	
Secondary	29.0 %	Private Cars	69.8 %
Technical	05.0 %	Taxis	23.3 %
University	17.0 %	Motorcycle-Bicycle	04.6 %
3. Monthly Income:		No Trans Means	02.3 %
Less 1000 SR	30.3 %	7- Utilities Satisfaction:	
1001-2000 SR	32.5 %	Electricity: Good:	54.0 %
		Average:	24.0 %
		Poor:	22.0 %
2001-3000 SR	20.9 %	Portable Water: Good:	33.0 %
		Average:	24.0 %
		Poor:	43.0 %
3001-5000 SR	11.6 %	Sewage Disposal: Good:	10.0 %
		Average:	16.0 %
		Poor:	74.0 %
5001-10000 SR	04.7 %	Telephone: Good:	35.0 %
		Average:	23.0 %
		Poor:	42.0 %

8. Environmental and Planning Issues of the Khansah Residential Area

8. 1. Environmental Issues

Khansah residential area faces environmental impacts, including: unstable balance between population growth and land capacity, with considerable population densities in some locations; and pollution of streets and vacant plots through random waste disposal. These environmental issues resulted by different means. The Khansah is built in unstable slopes that initiated different kinds of environmental issues within the residential area such as air pollution, noise, vision, human health and safety, etc. The topographic slopes are sharp, especially in higher elevation levels, which lead to floods and, in turn, wash-up mountain soils and rocks; prevent infrastructure supplies such as portable water and sewage disposal; and urban development in higher levels. It is also a major source of dust all year round because it is left without uncertain use or vegetation. It physically separates the residential area from the rest of the city, which encourage all informal activities and illegal living and may be crimes.

Human health in the residential area, moreover, could be influenced by different factors. The air movement within the residential area is restricted because of the urban pattern. The vehicular emissions are also one of the major sources of air pollution in Khansah, which resulted from the traffic jams and overcrowd in and around the residential area; unpaved streets are dusty and noisy; dust coming from the mountain; organic and solid waste dumped in streets and vacant lands; and sewage water overflowed in streets. The lack of adequate sewerage system has adversely affected the residential area. Surface pollution from septic tanks and pit latrines cause serious public health problems. The situation of the air borne dust also becomes severe during summers due to dust storms and lack of vegetative cover.

* Khansah is found with scattered dumps along streets and vacant plots. Khansah residential area has no permanent solid waste collection system. It generates 1.57 ton/day of solid waste from domestic and commercial sources. The average solid waste production of Khansah in 1427 H would be about 572 ton.

8. 2. Planning Issues:

* The fabric as unshaped and compacted mismatched masses; uneven distribution, poor conditions and unshaped pattern of buildings, imperfect finishing materials; dense development of old houses with very limited open spaces; and uncertain architectural styles are more related to slum pattern rather than urban.

* The Khansah residential area with its current urban profile and location between the second and third ring roads, a strategic location for future development, is not qualified enough for representing the civil profile of Makkah city.

* Availability of vacant plots of about 9% of the total built-up area of Khansah without any certain use. They became a source of pollution and places for crimes.

* The sizes of plots are quite small, with average size of less than 150-200 m², unshaped and interfacing in a way that comprising pattern of residential plots, street and building patterns.

* Unavailability of open public and semi-public spaces.

* The pattern and quality of the road system within the residential area is unshaped and not in a hierarchal pattern; with dead ends and without parking spaces. The areas in higher elevations are left without infrastructure, particularly portable water and sewage disposal. They could be only reached by uneven stairs, in terms of height, width and pattern.

* The quality and standards of the infrastructure networks of the portable water, sewage disposal, electricity and telephone are low because they are old and leak and incomplete. The electricity is not reliable because it breaks down most of the time for about 46% of the total population.

* The educational, religious and commercial services within the residential area are of low quality and standards, with uneven distribution, insufficient sizes and missing of health services.

8. 3. Socio-economic Issues

* People lives in the Khansah, particularly the foreigners, are mainly groups of low income families, with high rate of unemployment and different language. They are risk to the social life and culture of Makkah, in terms of increasing depression which would lead to enhancing crime and violence possibilities.

* Occupying more than one family in a residential unit led to raising the average number of persons/room up to 2.7 would obviously lead to social conflicts and diseases.

* The low educational level of major portion of the Khansah residences affects their work qualifications and, in turn, opportunities.

* Missing sport clubs and social centers in the residential area do not facilitate practicing social and sports activities.

* The concentration of people in Makkah has greatly improved the economics of the informal sector because micro and small businesses are thriving. The informal sector takes different forms of informal jobs, including bottle collecting, street vending, water bottles selling, car washing, etc.

9. Guidelines and Criteria for Sustainable Human Settlement Development in Khansah

9. 1. Objectives of Sustainable Settlement Development

The above analysis defined that Khansah suffers from planning and environmental issues, which are the result of different variables. Thus, the question of the next step is what the appropriate development solution could be applied to Khansah? Is it full transfer of current residents and redevelopment of the residential area (transfer and redevelopment) or applying a development policy to Khansah?

Khansah, in fact, still enjoys development potentials such as reasonable portions of: buildings of good and medium quality; infrastructure; services; and vacant lands suitable for different kinds of land-uses. The location of Khansah close to the Holy Mosque and Hajj Holly areas increase the value of all of these development potentials because they provide significant support during the Hajj and Umrah, particularly residential units on main streets. Khansah also includes about 2257 families and 799 buildings of different uses. Other aspects make the transfer and redevelopment policy quiet difficult such as mass of destruction and its impact on the environment; cost and time; availability of places ready for residents transfer, etc. Moreover, the trend for developing residential areas in the Central Area of Makkah, currently, based on the transfer and redevelopment, e.g., Jabal Omar residential area. Conducting the transfer and redevelopment policy in Jabal Omar has led to an empty highly valuable lands for more than 5 years without any chances of starting the development in the near future; raising the development cost dramatically as a result of frozen budget paid to residents to leave their properties, which, in turn, will boom the values of the new residences; decreasing the size of residence units essential for absorbing Makkah visitors; and socio-economic and environmental impacts on Makkah year round, etc. The transfer and redevelopment policy is also applied to other residential areas in the Central Area of Makkah, which are under process for more than 3 years without any clear image of start or progress. Therefore, it could be concluded that the transfer and redevelopment would be suitable for low quality or/and shanty buildings; and areas with limited population size and low building standards, which could be applied as a part of a general development policy for Khansah.

Consequently, the appropriate development policy to Khansah should not be only an affordable alternative to transfer and redevelopment. It should be more than infrastructure, enhance environmental aspects, minimize as well the disturbance to the socio-economic life of the residential areas, recognize ownership and security of land tenure and benefit the potentials of Khansah for its short term development. In other words, the main objectives of development in the Khansah residential area are: planning, guiding, and accommodating immediate growth that environmentally promotes the most efficient use of its scarce resources; and maintaining and enhancing a significant difference in the quality of life for present and future residents through obtaining for people an improved, healthy and secured living environment without being displaced. This is significantly better than removing them to costlier alternatives that are less acceptable to them.

9. 2. Criteria for Proposed Sustainable Development in Khansah

According to the development objectives of Khansah: promoting sustainable human settlement in supporting and accelerating development will significantly enhance its urban environment by eliminating land-use conflicts, enhancing their standards and applying permanent maintenance to their environs. The development of Khansah would require a planning development approach that should outline land-use to prevent any possible conflict. This approach should be based on planning criteria and design standards, which could be formalized into a development policy. The target is utilizing Khansah to its potentials, both efficiently and effectively whilst preventing uncontrolled development. The proposed sustainable development approach depends on achieving a group of basis and criteria as of the following:-

* The concept of sustainability evolves around three key elements; economic, environmental and social equilibriums. It means that community is a good, safe and healthy place for its members, offering a solid foundation for a prosperous life with equal opportunities for all. Thus, Khansah to promote its sustainability will maintain and, if possible, enhance its residents' quality of life; ensure social and

intergenerational equity; and maintain and enhance environmental quality.

* The analysis identifies the major environmental, planning and socio-economic issues in Khansah and, in turn, suggests options for action at the local level of Makkah city; including the need for a positive approach to urbanization in local development planning and effective urban governance; urban planning to coordinate and integrate development proposals; and implementation mechanisms for infrastructure, housing and land supply.

* Facing the urban problems that represent the most urgent challenges for Khansah, it is critical that four issues receive priority attention: improving urban poverty by promoting income-generation activities and transforming the role of informal sector; encouraging participatory strategies for the provision of urban infrastructure; promoting the protection and regeneration of the urban physical environment; improving urban management, including expansion of local governments' revenue-raising capacity and decentralize authority and responsibility for urban development from central government to local governments.

* The physical development of Khansah is an environmental prerequisite. The proposed sustainable human settlement development could constitute a development priority for: support integrated planning and management of residential areas in Makkah, incorporating street pattern, land use, housing, infrastructure, waste management, energy, employment and income generation and services; considering socio-economic and environmental aspects; related sectoral policies and legal frameworks.

* Awareness of people's responsibilities towards their environment is not seen clearly in Khansah, e.g. people are aware of controlling their houses (micro-environment or indoor space). They are not keen enough to take care of out door and wider environment such as roads and public spaces. Environment needs more public awareness, more distribution of information and education to enhance people to participate and share duties to take care of the local environment.

* Saudi Governments are making continuous efforts to improve infrastructure. The use of cars, higher levels of consumption and changing lifestyles require improved levels of infrastructure. Infrastructure for urban development is failing to keep up with the needs of the growing urban populations. The installation of infrastructure requires considerable investment. Thus, adopting user-pay policies would create possibilities for sound financial management of the investment.

9. 3. Guidelines and Recommendations for Sustainable Human Settlement in Khansah

The above analysis defined that Khansah is supported with limited physical assets, which could be the base for maintaining and enhancing the quality of life for its present and future residents; and obtaining for people an improved, healthy and secure living environment. As a result, the detailed guidelines and recommendations for sustainable human settlement development in Khansah, Figure 9, include:

9. 3. 1. General Approach

*** Integrated Master Plan of Khansah and Residential Areas in Makkah City**

To facilitate management, Khansah requires developing an integrated development master plan for Khansah, to deal with the wide variety of planning and environmental issues produced by the rapid urban growth in Khansah residential area. This process should go beyond Khansah by including the residential areas in Makkah city to outline development issues and difficulties facing Khansah as well as Makkah city, especially with continues rapid urban changes in the development process and, in turn, their impact on the residential areas. The master plan should be developed through:

- Surveying the current state of Khansah and residential areas in Makkah city, including land-use, socio-economic conditions, environmental aspects, etc.
- Defining development objectives of each residential area in Makkah city; developing policy options, and actions and alternative actions that may be taken to develop Khansah and the residential areas, as well as a predicting of the expected impact of each action; and enhancing physical assets and potentials

of Khansah in a sustainable manner, taking advantage of locations, environmental and landscape characteristics, natural resources, etc;

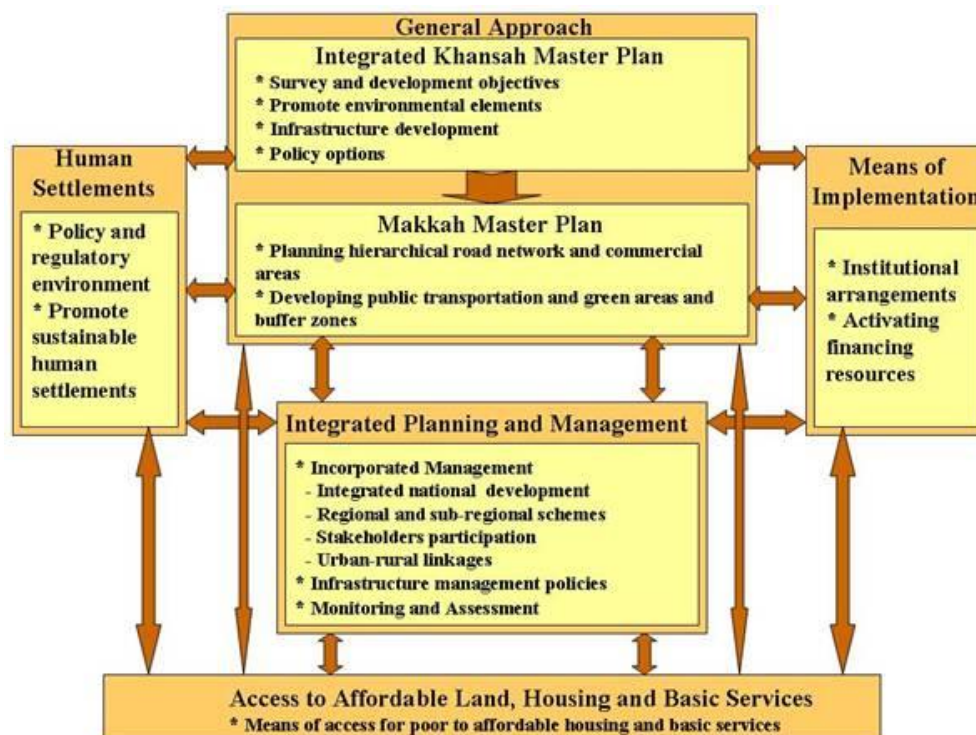


Figure 9: Guidelines and recommendations for sustainable human settlement development in Khansah

* This integrated development master plan should:

- Incorporate street pattern, land use, housing, infrastructure, waste management, energy, employment and income generation and services; considering socio-economic and environmental aspects; related sectoral policies and legal frameworks;
- Consider short, medium and long-term development of Khansah and residential areas to prevent unexpected future conflicts and duplications.
- Stress on the identification of practical measures on the three thematic areas of water, sanitation and human settlements:
 - Investments in water, sanitation and human settlements contribute to economic growth, sustainable development and better health and reduced poverty. The achievement of water, sanitation and human settlements goals, is critical to the implementation of the three pillars of sustainable development.
 - Various alternative development scenarios of infrastructure should be evaluated to find an optimal strategy for development.
 - The policy options and practical measures for expediting implementation relating to water, sanitation and human settlements should be integrated into national sustainable development strategies or plans.
 - Education for sustainable development and access to a reliable system of economic, social and environmental information on water, sanitation and human settlements enables informed decision-making and accountability.

* The Master Plan of Makkah City

The master plan of Khansah should be a detailed part of Makkah master plan, incorporating environmental considerations into each of the development sectors (environment, transportation, housing, industry etc.). The objectives of environmental compatible development must be reflected in the master plan. This master plan will also facilitate the management of the Khansah and residential areas.

- To ease traffic congestion and related environmental problems, a hierarchical network of road and streets should be developed, new or developing existing with improved width within residential areas,

including pedestrian facilities, parking facilities, traffic signs etc.

- An adequate and appropriate public transportation system needs to be developed in Makkah.
- For ensuring proper land-use control, adequate green areas and buffer zones need development.
- Planning commercial areas in hierarchy catering to the growing city and in such a way that its interface with transport and housing sector result into a maximum functional use.

9. 3. 2. Human Settlements:

Providing and facilitating policy and regulatory environment and mobilize the essential means of implementation through regional and national cooperation; increased financial resources to promote sustainable human settlements development in urban areas.

9. 3. 3. Integrated Planning and Management:

The role of management is to provide and maintain, in an efficient and balanced manner, public facilities and services which preserve quality of life and protect the public health, safety, and welfare of citizens. In performing this role, Makkah needs to make sure that the provision of public facilities and services is simultaneous with the impacts of new development. The management of Khansah and residential areas will mainly depend on their master plan and the master plan of Makkah city.

* Maintain incorporated management of Khansah and residential areas; incorporating land use, housing, and infrastructure management; employment and income generation; services, etc.; giving due consideration to urbanization trends and urban poor requirements in implementing the development policy, avoiding new environmental impacts, through:

- Integrating developing residential areas in Makkah city into national development planning, taking into account social, economic, cultural and environmental aspects.
- Establishing and strengthening regional and sub-regional schemes for planning and development of residential areas, and supporting such schemes through building capacity.
- Encouraging participation of all stakeholders, youth and dwellers in planning, implementation and, to some extent, decision-making processes. The most important element for success is commitment by all stakeholders: the city, the residential areas and the families. A sense of partnership must be developed among them and meet a real need. People must want it and understand the value.
- Incorporating urban-rural linkages into national planning processes through supporting research for outlining policies and measures to control rapid urban growth. Many poor households have livelihoods that draw on rural and urban resources or opportunities. Urban and rural areas are closely linked, each contributing to the other, which needs to be considered in development of residential areas in Makkah.

* Develop management policies of infrastructure; taking account of the need to address the impacts of urbanization, climate change and variability; and natural disasters, including:

- Assessment of natural disasters impacts on water resources and supply, and sanitation.
- Implementing monitoring and early warning systems of relevant progress and technology adaptation.
- Interlinking measures on water, sanitation and human settlements to increase their efficiency and impact by developing integrated and inclusive policies of planning and management in water, sanitation, and residential areas.
- Improving national coordination efforts to address water and sanitation, to manage the competing demands for water.
- Improving inter-ministerial coordination cross-sectoral coordination and planning mechanisms, and mechanisms for coordination between different levels of administration.

9. 3. 4. Access to Affordable Land, Housing and Basic Services

Applying access for poor in the residential areas of Makkah to affordable housing and basic services, by:

- Promoting stable and transparent land markets and strengthening land administration.
- Offering subsidies to poor people for housing and basic services, including the consideration of optional loans and subsidies that reflect payment capabilities of the poor for housing and basic services.
- Improving equal access to basic services and land tenure. Transferring tenure rights has been shown to motivate residents to invest two to four times the amount of funds that the government invests in

infrastructure improvements in a slum area.

- Promoting public-private partnership for financing and developing infrastructure and affordable housing.
- Strengthening enforcement capacity for building codes and laws for housing.
- Promoting research, production and use of local construction technologies and building materials and integrating traditional knowledge and practices in national housing policies.
- Facilitating transfer of technology for low-cost housing construction using local materials.

9. 3. 5. Means of Implementation

For implementation, the institutional arrangements must get right through:

- * Giving encouragement for agencies to work with the poor, keeping everyone informed and coordinating between stakeholders, defining clearly the roles of the various agencies; and keeping sustainability concerns a priority in financing, institutions, and regulations.
- * Activating adequate resources to meet infrastructure and human settlements goals and targets, and encouraging domestic sources through a range of financing approaches, such as:
 - Increasing donor financial support to infrastructure and human settlements schemes.
 - Identifying and promoting innovative and sustainable means of financing.
 - Enhancing the sustainability of residential areas that provide essential resources and services for human well-being and economic activity.
 - Increasing allocations from national and sub-national budgets.
 - Providing support for capacity building in the residential area

10. Conclusion

This paper discusses the development of urban environment of residential areas, Makkah city, Saudi Arabia by promoting the sustainable human settlement approach. The environmental, planning and socio-economic issues of Khansah residential area, as a case study, have increased the importance of enhancing a sustainable development policy to overcome the impacts of these issues on the environment. The trend of developing residential areas in Makkah is the full replacement, particularly within the Central Area. This trend, in fact, would not be appropriate for developing all residential areas within the city. This is because it would rise additional planning, socio-economic and environmental issues such as shortage of places for absorbing population growth and visitors of the city; and increasing waste disposal, environmental impact, etc. Therefore, defining suitable development policies for the residential area became a must.

Moreover, the investigation of the international experiences of developing settlements comprises several cases of similar urban characteristics of Khansah and Makkah city. The investigation of these experiences shows that sustainable human settlement development is one of the most effective policies suitable for maintaining and enhancing the quality of life for present and future settlement residents. Sustainable human settlement development, therefore, has become one of the major socio-economic forces in the world, since 1990s.

On the other hand, the outcomes of the survey, questionnaire and analysis proof that of Khansah residential area has scarce physical resources and assets, which could support sustainable development mainly in the short term. Accordingly, sustainable human settlement approach in Khansah residential area can promote the most efficient use of the scarce resources, maintain and enhance the quality of life for present and future residents; and obtain for people an improved, healthy and secure living environment without being displaced.

Within this context and to prevent new slum formation, the implementation of sustainable human settlement development require action at the local level of Makkah city; and at the national level of development, taking into account the need for a positive approach to rapid urban growth in planning and effective urban governance; and social, economic, cultural and environmental aspects.

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