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Urban Growth Within a Finite Space: Case-study Muscat

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Abstract

During the last four and half decades of physical urbanization, Muscat, the capital city of Oman, has received a massive influx of local and international migrants.\(^1\) Based on the National Centre of Statistics and Information (NCSI) in April 2016, Oman’s population was recorded at 4,441,448 with the population of Muscat Governorate forming more than half of Oman’s total population (2,395,412). According the NCSI statistics in 2010, Muscat represents the highest rate of urban population in Oman by 97.44% (almost 36% of the total urban population in Oman). This swift demographic change has reshaped the overall urban fabric of the city.

On a spatial level, although Muscat Governorate represents merely 1.3% of Oman’s total area, the suitable areas for development have been nearly exploited. Horizontal development based on villa residences has largely influenced the rapid consumption of land. The physical terrains in Muscat such as mountains, creeks, and valleys also limit the amount of proper land for urban development.\(^2\)

Urban growth in Muscat has endured a long history of political and socio-economic variables. Obviously, these variables have largely affected the entire urban pattern at every period of time. Unfortunately, the various governmental institutions responsible for urban management since the early seventies created imbalanced attitudes between the availability of natural resources and the rate of consumption. Urban governance based on centralized decision-making has widened the urban issues. The land distribution system has largely contributed of rapid consumption of land. For instance, despite its limited area and large population, Muscat’s residential plot size is equivalent to those in other areas throughout Oman. The land granting system that is based on random lottery has largely contributed to the emergence of low-density, scattered territory in Muscat and many areas in Oman. Land for investment that could enhance the economy or that provides jobs has become scarce. Furthermore, huge areas have been consumed for automobile-based use.\(^3\)

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3 Al Gharibi, “Urban Growth from Patchwork to Sustainability Case Study: Muscat”, 2014.
Obviously, the sharp increase of population in Muscat, which has quadrupled several times during the past four decades according to the NCSI statistics, has largely contributed on the depletion of available natural resources. As Muscat serves as the headquarters for most of governmental offices and companies, it has been the focus of internal migration thus receiving the highest number of job seekers. Meanwhile, as Muscat serves as the centre for major government and investment, it received the bulk of the expatriate population both in terms of “white collar” and “blue collar” workers. Horizontal low-density areas have been developed to house the influx of those immigrants. With increases in traffic and in the absence of a viable public transport system, huge areas in Muscat have been asphalted for vehicular use.

This paper intends to visualize the transformation of socioeconomic conditions and their impacts on the current urban patterns. It attempts to focus on the negative consequences that might be encountered if the current urban management persists as Oman moves toward a post-oil period. Meanwhile, it provides indicators to urban governors and decision-makers as to the need of urgent intervention towards resource saving, and socially- and economically-balanced utilization of limited resources.

Introduction

Although the population in Oman is still modest (4,159,102, mid-2015), it recorded a remarkable growth during the past four decades, almost quadrupling between 1970 and 2015. Simultaneously, census statistics recorded a tremendous growth rate in urban population in the same period. Muscat, Oman’s capital city, inhabits about half of the total population. As known, space is a significant element in a city and without it, life cannot properly sustain. Urban transition in Oman within the past four decades has largely influenced the availability of suitable space for development. Obviously, several political ordinances in land policy have largely influenced the current shape of our city. For instance, the land granting system, which is based on giving each national individual a residential plot, has paved the way of creating an extremely low-density urban development. Also, the decision that allows women to get their own residential plot has widened the problem. Unfortunately, those singular decisions have not taken into consideration the local aspects and geographical circumstances for the entire territory of Oman. After four decades of urban development, a city like Muscat has failed to attain the characteristics of a liveable cities and the capacity to overcome the forthcoming socio-economic crises.

There are five fundamental aspects of great, liveable cities: strong neighbourhoods, walkability, a network of attractive public spaces, affordability, and regional connections.

Urban sprawl in Muscat has taken on bulky consumption of land for residential uses and

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related services and on contrast, it decays the local environment. For instance, large mountainous areas in Muscat have been destroyed to create infrastructure for cars and offshore reclamation has been done to build tourism residential complexes. These initiatives (and the attitudes that have fostered them) tend to reduce the liveability of the city and its quality of life. During the past 45 years, large areas of land in Muscat and elsewhere in Oman have been given to locals for free ownership, most of which has been used for residential purposes. However, acres of land remained undeveloped since owners did not have the financial means to develop their land and do not have a pressing need to develop them since they have alternatives. The land granting system which is based on random lottery draw has largely influenced the emergence of low-density and dispersal urban areas. Despite their remote locations, the government is forced to deliver basic infrastructure services, such as electricity and water. Normally, the government expends a great deal of money and effort to supply these scatter developments with basic services, which generally take a long time to reach. Also, the areas remain a long time without public rights-of-way, such as pedestrian pathways, green areas, parks, and children play areas. Overall, the last four decades have been characterized by a great deal of socio-economic change in Oman. The rapid transition from rural-based lifestyle patterns to urban-based lifestyle boosted the consumption of natural resources, mainly land, water, and oil. Single land use has contributed to the emergence of a car-reliant society. As noted by Al Gharibi: ‘the land use segregation contributes to the long-distance commute with the private automobile. Bicycles are still not a favourite commuting means for the Omani society for cultural reasons. Some people relate using a bicycle as embarrassing behaviour or an indicator of poverty, while driving a car is a source of pride and an indicator of wealth. In Oman, building standards have extensively contributed to the horizontal low-density urban pattern. These codes, which encourage spatial segregation, are based on vehicular corridors rather than pedestrian pathways. That is why you feel all land uses are largely separated as they cannot be reached without cars.'

The paper aims to explore the effects of the depletion of natural resources, mainly land and water resources, particularly in Muscat. The paper focuses on Muscat where about 30% of Oman’s total population live and where there is limited proper land for housing and investment. Due to the rapid increase in population and the scarcity of land, Muscat has become incapable of managing the growing demand for housing and investment. The current planning policies in place that grant large freehold lands for citizens to build separate free-standing villas, along with private car-based transport policies, have led to considerable land consumption in Muscat in a short period of time. Thus, the significant questions in this case are: How can Muscat cope with rapid population growth with the current high demand of land for housing and investment? How can Muscat provide housing

for its national and immigrant population with the current land scarcity considering that this group represents more than 60% of population? What is the projected scenario associated with social and economic aspects in the case that current urban policies persist? How can Muscat refine the existing planning policies to create sustainable urban development and to be competitive with other key cities in the region?

The discussion within this paper is based on qualitative and quantitative data. The qualitative data is based on self-observation and critique of context issues inspired by my long-term work experience in the urban field. Qualitative data was also obtained from interviews with local authorities from the Supreme Council of Planning, Muscat Municipality, and Ministry of Housing. The quantitative data is based on the analysis of National Centre of Statistics and Information (NCSI) data as well as literature reviews which focused mainly on Muscat and on Oman in general.

Driving forces of rapid land consumption
Rapid population growth

In Oman, rapid urbanization has occurred as a result of the economic recovery sparked by the export of oil in the late 1960s. Since then, the economic boom has gradually changed lifestyle patterns throughout Oman. Local populations gradually began to leave their agro-fishing jobs in rural areas and immigrated to urban centres where effortless jobs were available. Meanwhile, an influx of expatriates arrived to fill traditional jobs which had been occupied by locals before they left them to work in the government sector. Urbanization in Oman reached a rate of 84% based on the World Bank data. Muscat received the majority of immigrants because it serves as the main business hub and head of main governmental institutions and companies. According to NCSI publications in 2015, expatriates represent about 63% of Muscat’s total population while nationals comprise the remaining 37% minority. The expatriate population exceeds nationals in Muscat by 352,611 people. These figures compare to neighbouring GCC countries with similar if not higher rates of expatriates. The expatriate community is generally excluded from buying property, but does contribute significantly to the rental market in Oman. The demographic pressure has been a main driver of urbanization. While the population continues to rise, the amount of space is gradually declining, and the urbanization curve of the Muscat Capital Area (MCA) will reach a saturation level of 80% in the near future. Furthermore, the ecological footprint in Oman is rapidly becoming more pronounced. The per capita consumption of electricity in Oman shows that the Omani population, and the inhabitants of the MCA in particular, use resources excessively.

According to NCSI forecasts, ‘322 thousand people is the biggest expected rise in population during the coming twenty five years 2015 – 2040 in Muscat Governorate under the assumption that the policy of reducing the number of expatriates will continue.’ It also indicates that

\(^{10}\)World Bank, 2017.

\(^{11}\)von Richthofen and Langer, Evaluating the Urban Development and Determining ‘peak-Space’ of Muscat Capital Area”, 2015.
‘313 thousand Omani would be the expected size of increase in Muscat Governorate population by mid-2040, 75% among them would be in the age group 15-64 years.’ The author seriously doubts this can be achieved due to the fact that the government has declared giant projects to enhance investment and to develop non-oil revenue in the short-term. For instance, the investment of OMR 500 million towards a tourism-based mixed-use waterfront development which will be built over 64 hectare of land will alone require several thousands of labourers.

Based on NCSI in April 2016, the expatriate workforce dominated the private sector by 89% while the Omani only represent 11% of the workforce. The growth trend of expatriate workforce (and population) may partly be an indicator of the failure of the “Omanisation Policy”, which has been in effect since 1988 with the intention of replacing the expatriate workforce with nationals. Unfortunately, the Omanisation could not attract the nationals to step into the construction sector. Salaries and incentives paid to employees in the public sector largely exceed those in the private sector. Thus, there is a clear reluctance for people to work in private companies. Generally, a graduate would rather stay at home for several years in order get a job in a governmental office than to work in the private sector. Thus, Oman is entirely dependent on expatriate-driven construction. Furthermore, since Muscat hosts the headquarters of government and private institutions, MCA has received thousands of migrants from other regions. Although plenty of employees stay in Muscat from Sunday to Thursday returning back to their hometowns during weekends, many of them have settled in Muscat with their families. They are incentivized to do so by the land law that allows them to acquire one residential plot either in their hometown or workplace. However, since the real estate market in Muscat is very high compared to other regions and many employees wish to live near their workplace, the vast majority of them prefer to get a piece of land within Muscat. This tendency has led to the rapid depletion of land in MCA.

Transformation of family structure

The phenomenal change on family structure over the past four decades has broaden the need for housing space. Until just before the emergence of the oil period, most families and their children formed “extended family” by living together with cousins, aunts, and uncles. They all lived in one house sharing all its utilities. They shared their work and their production formed a very strong cooperative society. More recently, each family maintains a more independent life, with only nuclear family members living in a single detached home. This new trend has led to the emergence of a highly patchy urban pattern and an overload on the use of natural resources. The dramatic change in family structure has added to the demand for larger plot size.
Unsustainable urban policies

Urban sustainability encompasses social, economical, ecological, political and spatial dimensions. The research presented here refers to the subset economic and social dimension, mainly the inefficient and socially unfair consequences of the present land-use policy in Oman. The research acknowledges the discourse on urban sustainability as a political instrument and its appropriation in the Gulf States.

Single detached house on large plot size in single land use zone

Large size of plot is another contributor to the rapid consumption of land in Muscat. Unfortunately, the land law does not differentiate the cities that have limited areas in terms of the size and quantity of granting plots. Therefore, since there was no restriction on demographic and spatial circumstances, Muscat had the greatest detriment as far as rapid consumption of land within the last four decades. One of the significant factors for the rapid exploiting of land in Muscat, and elsewhere in Oman, is the transformation of built-form structures. Muscat, as well as the entire country, has had a drastic change in the degree of urban city form and construction of free-standing buildings over the last four decades. Since the late 1960s, the built-form of Omani cities has progressively changed.

Unlike the current housing units which have been occupied a single nuclear family, every housing unit in traditional neighbourhoods was occupied by two to three extended families

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despite its tiny area. The building structures were normally built on rocks and non-fertile land whereas the fertile land was preserved for food production. The transformation of built form from mud-structure buildings to current villa-structure buildings has largely influenced the consumption of land. The land consumption for housing prior to the oil-period was very limited. The housing units were attached to one another and the built-up area for every unit did not exceed 200 square meters. Even after the economic transformation which began in early 1970s, the urban form has passed through various stages. With every stage buildings needed larger land areas up until today's current stage. According to Al Gharibi, the size and built form of a residential unit has considerably changed since the early 1970s. The standard size of residential plot had not exceeded 240 square meters prior to 1970s, it reached 400 square meters in the period of the 1970s and 1980s, and further increased to 1200 square meters in the period of the 1990s to present. This is driven by the emergence of the villa as a common housing typology.\footnote{Al Gharibi, "Urban Growth from Patchwork to Sustainability Case Study: Muscat", 2014, 116.}

![Figure 2: Transformation of plot size and housing unit within the past four decades. Source: (Al Gharibi 2014, 89).](image)
Setback is a common planning standard that provides reasonable space between buildings, and basically aims to attain privacy. ‘Setbacks which are 3 meters as a minimum width consume a vast majority of the plot area. Figure [3] indicates a plot with an area of 600 square meters and maximum built up area as 40% (240 square meters), which means 60% (360 square meters) of the area is not allowed to be developed. Hence, these areas are neither suitable for a courtyard nor for other purposes.’ This area is normally left vacant because it is neither appropriate for a house-garden nor for an out-door courtyard. This is a strong indication that the existing planning standards have largely contributed to the extreme consumption of land.

Figure 3: Built form based on the planning standards for plot 600 m² (20 m x 30 m)
Source: (Al Gharibi 2014, p.104) based on MoH

Land for car utilities

Automobile infrastructure, such as asphalted roads and parking lots, have contributed to rapid consumption of land, particularly in Muscat where nearly 50% of Oman’s population own at least one car. The urban policies that cater to private cars as the main mode for transit has led to extreme consumption of land. The great demand for cars stem from the lack of alternative modes of transport, which has led to grid lock and heavy traffic on most streets in Muscat. The solution has been limited to constructing new roads or widening the existing ones, all of this exacerbating the matter further and allocating more land for cars. The consumption of land for parking and car utilities includes providing huge space for parking lots in shopping malls and hypermarkets, which occupies valuable land in cities. For instance, in spite of its valued location in Muscat, the City Centre shopping mall in Seeb and Lulu Hypermarket in Baushar have built-up areas for shopping that represent merely one-third of the area designated for car parking.

Integrated Tourism Complexes

According to Ministry of Tourism statistics, there is a list of 14 main existing and ongoing projects that are classified as Integrated Tourism Complexes (ITC) across Oman. These projects were undertaken to attract investment in real estate so as to promote the rental market. Commonly, these projects occupy very unique positions in cities for the purpose of attracting clients to buy or rent at a very limited time. However, large part of beaches and public spaces have become exclusively utilized by the investors of those projects. With such, the public realm has been restricted and has become very scarce. For instance, Al Jassah Beach, which was a natural beach where many families used to spend holidays and weekends to enjoy blue ocean waters away from the busyness of the city centre, has now come under a property development company and is blocked from public access and use. This place is not a typical beach, but it stands out as a natural blend that combines mountains, land, and sea. It was a safe haven for those who had troubles due to daily stress, who sought to get some fresh air or wanted to get reprieve from of the city’s noise. Yes, it is in the heart of the capital Muscat, and majestic as a natural place. Historically, it has been said, whoever owns this place, owns the heart of Muscat. At times, the place was the subject of conflict between European empires during the 19th century. Along with Al Jassah, Azaibah, Yitti, Madinat Al Zarqaa beaches have all been turned into resorts and hotels, thus people have nowhere to go.

In normal circumstances, projects like these are first launched on papers only, accompanied with well-organized media campaigns and presented in graphical and physical models that

20 Al Jassah Beach is located in along northeast Muscat’s northeast coasts, it is one of Muscat’s features highlighted beaches which has a with very clean silver sand, aligned with the mountains that wraps the area and works to block the strong winds to and turns the beach into a quiet lake. What distinguishes this beach is the beautiful rocky islands that are scattered over areas near the coast. These islands lie on quite quiet waters to add an aesthetic touch to the site. People can rent small boats to have short marine cruises and enjoy the exclusive natural landscape of terrain and the quiet blue sea.
fascinate people’s eyes and assure funding from customers before the construction process commences. The problem that those projects occupy plenty of acres of land in cities. These projects which are based on freehold ownership of real estate for non-Omanis, owe nothing for the local community and have a very limited contribution to the GDP. Large parts of these projects are being developed in Muscat due to the large revenues they are expected to generate since Muscat represents the most vigorous real estate market in Oman. Therefore, these projects have largely contributed to extreme consumption of land in Muscat. The Wave Project which is situated just north of Muscat Airport, alone occupies more than 6 kilometres along on the beaches between Al Arabia to Seeb. Madiant Al Zarqa also occupies more than 16 kilometres of coastline along the area at Al Sawaadi (45 minutes from Muscat).

The impact of these projects was not only on the consumption of public space, but also on the ‘health’ of local public life. For instance, ‘the filling up and alteration of the site of the future Yitti Resort, initiated in 2006, is causing problems for the people living nearby. The water from the sea does not reach the Yenkit village anymore and the marina is also causing problems for the inhabitants: water coming down the wadi cannot escape into the sea and it ends up flooding the villages instead.’ This project also caused people to relocate from their beach-side villages to new areas which are away from the sea. These resorts had a major impact on the social fabric amongst families because families were lived in a form of social cohesion through their teamwork as fishers. Since they relocated to new housing settlements which are relatively far from the sea, the relationship between them and the sea has become weaker since they need to use a car to access the sea. In turn, this has impacted the social relationship among them and their overall fishing production. This relates to the idea of social spatial justice also applicable in Oman.

Natural and manmade constraints limit land

There are various environmental and artificial constrains that have eliminated the quantity of proper land for development in Muscat. The natural part includes the physical terrains of mountains, valleys, etc., which represent more than 15% of the total area in Muscat. These natural constrains have largely contributed to the dispersing of urban development in Muscat. See fig. (5) The second element which is related to the land is that it is mainly occupied by some governmental institution. Over the past forty years, several acres of land in Muscat have been handed over to various authorities, such as Ministry of Defence encampments, Diwan and Palaces, Ministry District, Embassies District, etc. According to Weidleplan-Muamir, ‘these institutions occupy a total of 3,164 hectares’ of Muscat’s total area. Part of these land are developed but the majority of the areas have been ‘left vacant for ages.’

21 Jovanovic, Meili, and Diener, “Muscat and Oman - Restructuring a Desert Landscape”, 2013, 286.
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Figure 4: Physical terrain restricts land availability for development in Muscat.

Figure 5: Major Land Use Restrictions in Muscat. Source: Weidleplan and Muamir, Muscat Structure Plan, 1991.
Impacts of rapid land consumption
The limitless land expansion within a limited space

The settlement patterns prior to the Omani Renaissance in the present location of Muscat Capital Area that have been reconstructed from military maps show a dense network of links and cores structuring the landscape.25 According to Jovanovic, Meili, and Diener ‘there are mainly three urban types repeated within the Greater Muscat Area and together they constitute the city today: (a) the historic fishing villages, (b) the city built into the space between the mountains from the 1970s on, and (c) the city expansion in the direction of the Batinah Plain since the 1980s, later also on the Al Amarat Plain.’26 The main problem of urbanization is that the city of Muscat, as with many cities across Oman, has not set a limit for the urban expansion.27 Horizontal development continued and upward pacing over the past four decades due to the continuation of urban policies that allow every national citizen to get a piece of residential land upon reaching the age of 23.

The Ministry of Housing continued the granting of land to citizens in Muscat without consideration that the space is finite. The main focus has been to satisfy an applicant with a piece of land who may hold or sell it to fulfil other life needs. As such, the Ministry of Housing is not dependent on a comprehensive land-use plan that may, in a sort of way, curb the regional urban growth. The areas that occupy granted lands appear absolutely void of basic infrastructure at the time of land distribution. Therefore, those areas remain cheap until services are gradually provided. Land speculators tend to buy lots of plots to reserve them until the arrival of services so as to sell them at higher prices. Sometimes, land may remain on hand of the land speculators for long time without being developed. Consequently, the overall urban development in most areas is observed as fragmented and dispersed.

Certainly the local community has the right to enjoy safe and comfortable housing units. However, there is a problem related to the extreme depletion of land that might affect the economic and social development, and consequently disregard the rights of future generations. During the past four decades, thousands of acres of land have been handed over for private ownership. Currently, the country plans to conduct mountaintop mining in Muttrah (Northeast Muscat) to cover the scarcity of residential land in the capital city that has been an issues for more than a decade. Based on Ministry of Housing statistics, there are more than 216,000 land applicants in queue awaiting their residential plots in Muscat since 2008.

In relation to privatizing land, Gillham28 argued that ‘as long as land remains privately owned and its rights remains unencumbered… [it] is susceptible to being subdivided

26 Jovanovic, Meili, and Diener, “Muscat and Oman - Restructuring a Desert Landscape”, 2013, 52.
and built upon.\textsuperscript{29} The author of the book “The Limitless City” explicated that ‘without a highly developed system of private land ownership and a viable market for land, sprawl as we know it would be virtually impossible.’ designates that the ‘concept of private land ownership is the foundation upon which the private home is built’. He also demonstrated that ‘the private ownership of land and the huge, almost liquid, market for it are vital to the very survival of suburban sprawl.’\textsuperscript{30} Gillham indicated that ‘the unique pattern of sprawl can be partly attributed to the abundance and relatively low cost of land, which is necessary to allow dispersed, low-rise development to occur.’ 

Over forty years, thousands of acres of land in cities have been transformed for private occupation. According to Ministry of National Economy statistics, 492,642 plots of all uses have been granted throughout Oman up to 2008. Of this amount, 433,187 plots (approximately 88\%) are for residential uses. Muscat has dominated about 30\% of the total amount of distributed lands in Oman by 146,010 plots. The residential plots that have been granted in Muscat up to 2008 are estimated to be 128,816 plots, which also represents about 30\% of the total granted plots in the whole of Oman.\textsuperscript{31} The land scarcity in Muscat which curbs rapid land distribution, has boosted land prices particularly in most densified urban areas such Khuwair, Qurm and Khoad. The land prices in all of Muscat have continuously risen despite the decline of prices in other regions in Oman.

Urban growth in MCA was first monitored by Fred Scholz up to 1990.\textsuperscript{32} Then, Al Awadi measured urban growth in MCA from 1970 until 2003\textsuperscript{33} in a designated area while he mapped scenarios for the urban expansion in Muscat up to the year 2050 according the current rate of land allocation system. Al Awadi showed in his research “Analysis, Assessment and Modelling of the Urban Growth in Greater Muscat” “the major increase in urban growth has taken place in the decade 1970 to 1980 and amounted to more than 3.5 times the previous extension. At the same time, a significant increase in residential land has taken place in the same period. In comparison, the agricultural acreage barely changed from 1960 to 1970. A large number of dynamic enquiries can be made of this dataset concentrating on the different land use categories and the extensive time periods afforded by the data. For example, Public building category has the largest share of the built-up area especially in period of 1980 and later. It formed about 29.8 \% in 1980 and rose to 30.2 \% in 2003\textsuperscript{34} and with further detail by for the timeframe 1984 – 2014 by von Richthofen and Langer.\textsuperscript{35} According to Al Awadhi, in Muscat ‘the total urban expansion reached more than 650\% between 1960 and 2003, with an annual growth rate of approximately 20\%’.\textsuperscript{36} This huge trend

\textsuperscript{29} Jovanovic, Meili, and Diener, “Muscat and Oman - Restructuring a Desert Landscape”, 2013.
\textsuperscript{31} Al Gharibi, “Urban Growth from Patchwork to Sustainability Case Study: Muscat”, 2014, 199.
\textsuperscript{33} Al Awadi, 2008.
\textsuperscript{34} Al Awadi, 2008.
\textsuperscript{36} Al Awadi, 2008.
on land expansion is considered as a wake-up call that refers to the size of the problem that will ail Muscat after converting their territories into private-single family residential villas.

Figure 6: Muscat urban body.  
Source: Diener, R. et al. (2013), p.1/72

Figure 7: GIS simulation for urban expansion in Muscat (2005-2050).  
Source: Al Awadi (2008)
Low density urban morphology

Density is another significant parameter that measures urban growth. The land granting system, which is based on drawing residential plots by citizens in public random lottery, boosted the scatter development. Since the drawn plots are not given a set time-line limitation for being developed, the development takes several years until reaching a reasonable density. In addition to residential plots, huge areas have been kept undeveloped within every urban settlements as Kader indicated: ‘a large number of unused plots and board areas of free space along many streets, often even along smaller residential ways, were found’37 The latest research that focused on the same subject is held by von Richthofen and Langer.38 They introduced a concept to examine the urban morphology in Muscat Capital Area (MCA) by using the technique of Object-Based Image Analysis (OBIA). The technique intended to measure and analyse the regional urbanization area based on the concept of ‘peak space’ as an ‘indicator’ in order to establish the limits of the MCA’s growth. Low density is a significant element for urban sprawl. Despite urban expansion, Muscat has experienced a gradual densification over the time at a spatial level as shown in figure (8); population density remains at modest level. The reason is because urban development relies on horizontal urban morphology that is based on the villa as a common housing prototype. Von Richthofen and Langer illustrated that low density areas dominated most of MCA territories in 2014, as shown in the ‘spatio-temporal evolution of the Urbanised Regions.’

Figure 8: Spatio-temporal map of the urbanized regions (UR) of MCA 1984-201. Source: von Richthofen & Langer (2015), p.5

37 Kader (2015) in TRIALOG 114, p.21
According to NSCI data, the relative distribution of the Sultanate of Oman shows significant differences in areas between various regions. The smallest area is Musandam Region (the far northern part of Oman) with less than 1%, while Dofar (the far southern part of Oman) is the largest region with 32%. Although Dofar possesses about one third of the total area of Oman, the population represents merely 9% of Oman’s total population. The three regions: Muscat, North Batinah, and South Batinah occupy merely 5% of total Oman’s area despite being home to more than half of the population (56%). Obviously, the population density ranges from less than one person per square kilometre in Wusta Region and 204.4 persons per square kilometre in Muscat.
Destruction of local habitat

In Muscat, over time, many areas which are considered as natural channels for valley runoff have been turned into residential and commercial utilities. Various malls and other commercial activities were built along or within valleys runoff channels and rain collective bonds. For instance, The Qurm City Centre Mall was recently developed in the valley’s basin. Before this, on the other side, ‘in the late 1980s the central area in Qurm was turned into a commercial district despite its initial function, which was basically for wadi run off. Currently, this area accommodates multiple commercial malls and is surrounded by acres of car parking lots. Consequently, it becomes a drainage basin for water runoff particularly when it is flooding.’ Also many valley channels have been developed as transport corridors, such as the end part of Muscat Express Highway in Qurm. Due to the increase in traffic, local authorities decided to widen this part of the highway by occupying the only valley channel that drains rain water. When it rains, the traffic has to be halted because the highway turns into a channel for torrential water. The large parts of the unique mountains which adorn Muscat were levelled to make new roads or various utilities. For instance, ‘at many points, large parts of the mountains are being excavated in order to gain more buildable plots, creating also health problems for the nearby inhabitants.’

Lack of identity and sense of place

Serag El Din et al. introduced ‘seven main dimensions which contribute to realize the urban quality of life: The first dimension, generically titled Environmental Urban Quality of Life, refers to the natural aspects of the neighbourhood. The second dimension, Physical Urban Quality of Life, refers to facilities, urban fabric, land use, services and facilities, and infrastructure. The third dimension, Mobility Urban Quality of Life, discusses the accessibility, traffic and transportation issues. The fourth dimension, titled Social Urban Quality of Life, comprises the indicators that refer to the social dimension of the neighbourhood and to the people interaction, that is, questions regarding individual choices and the participation of citizens. About the fifth dimension, Psychological Urban Quality of Life, it discusses the issues concerning the feeling of citizens toward their neighbourhood, such as the identity of the place. The sixth dimension is Economical Urban Quality of Life which characterizes the neighbourhood as a place of economic activities. Finally, a seventh dimension, titled Political Urban Quality of life, refers to the city policies which support the concept of urban quality of life and the extent to which these policies are implemented. The liveability of cities is essential to improving a city’s identity and values, making it attractive to inhabitants, visitors, talents, as well as businesses, developers and investors.’

40 Jovanovic, Meili, and Diener, “Muscat and Oman - Restructuring a Desert Landscape”, 2013.
42 ISOCARP, 2010, 2.
It has been argued in thousands of debates that neighbourhood is a place where its members can socially interact and have substantial face-to-face communications. The new urban development that have been emerged over nearly four decades have dismissed the traditional neighbourhood (locally called hara) that was based on collaboration and cohesion relationships amongst the inhabitants. Despite the rapid urban development throughout the country, the sense of space in most current urban settlements remains very weak. The scattered large-scale development with lacking basic infrastructure in most urban areas in Muscat decreases the sense of place and community involvement. The lack of public spaces and public green areas in urban areas in Muscat also eliminate the feeling of community and sense of enclosure. The great traffic with lack of safe pedestrian pathways in most urban areas also affects the sense of space. When we walk through this urban landscape, it generates an inside feeling of illusion and disorient. The urban development in Muscat, as well as other regions throughout Oman, lacks the elements that characterize neighbourhood at any city. The frequent urban planning that results in similarity in many areas has not only minimized the quality of place but also decreased the level of identity and sense of community. The outline of a neighbourhood with its ordinary urban form as it was described by scholars cannot be observed in the existing scattered urban development in Muscat.

Urban expansion destroys land for food production

The urban expansion has not only eliminated land for housing and investment but also contributed to harming food security when land suitable for agriculture started to become scarce. It is often argued that cities, in collaboration with suburban areas, have to achieve food security by encouraging local food production. Local authorities created an issue by allowing farm owners to convert their agricultural lands to commercial and residential use and disregarding the need to preserve these arable lands to sustain food security. Since the early 1970s, thousands of hectares of arable lands have shifted to commercial and residential purposes. Consequently, nowadays, more than 90% of fruits and vegetables are imported from other countries. Meanwhile, revoking the “General Authority of Marketing Agricultural Products”, which moderated and marketed local agricultural products in the 1970s and 1980s, has largely had the impact of decreasing the rate of local food production and the general participation of the agricultural sector in GDP.

Discussion and Conclusions

The author believes that sprawl in Muscat as well as in some other areas in Oman is mainly a result of unsustainable planning for urban development. A number of scholars and researchers consider ‘sprawl’ as the main liable cause for extreme consumption of land and many other socio-economic issues. It is obvious that some debates which focus on sprawl are applicable to the existing urban patterns in Muscat. For instance, Gillham delineates sprawl as ‘a form of urbanization distinguished by leapfrog patterns of development, commercial

strips, low density, separated land uses, automobile dominance, and a minimum of public open space.\textsuperscript{44} Furthermore, Connerly et al. was more precise to note that ‘urban sprawl was defined as one or more of the following developments: (1) leapfrog development; (2) ribbon or strip development; and (3) large expanse of low-density, single dimensional development.\textsuperscript{45} Bullard argued that ‘sprawl is frequently defined as poorly planned, land-consumptive development at the edges of cities, surrounding suburbs, or in rural fringes within commuting distance of metropolitan centres.\textsuperscript{46} This description summarizes the existing context in Muscat and some other parts in Oman. The lack of planning strategies encouraged the emergence of single land use in Muscat. The high demand for land within a short duration caused the local authority to focus on residential land use and to ignore the other significant land uses. For instance, areas like Mawaleh, Khoad, and Mabela emerged as residential areas without a balance of mixed-uses activities. Therefore, people who live in those areas now must travel a distance to access all other uses such as workplaces, leisure, etc.

Returning to the main questions that were raised at the beginning of the paper: How can Muscat cope with rapid population growth with the current high demand of land for housing and investment? How can Muscat provide housing for the middle-class with the current land scarcity since this group represents above 60% of population? What is the expected scenario associated with social and economic aspects in the case that current urban policies persist? How can Muscat refine the existing planning policies to create sustainable urban development and be competitive with cities in the region? Since Muscat’s population has reached approximately one and a half million people according to NCSI statistics, governmental officials have to seriously consider some degree of reform to land administration laws. Despite the prevailing belief that granting land in public random lottery would result in social equity, a great deal of economic, social, and environmental issues have emerged. At the economic level, consuming land for low density residential development for car use has led to the loss of some valuable resources that could be better used to enhance GDP revenues. A new strategy to reserve land for attracting business and investment will have better economic profits and social benefits. On a social level, continued land consumption by this outdated mode will eliminate future generations’ rights to land. Hosting nearly half the population of Oman, Muscat has to be considered as an exceptional case when compared to other governorates. Its acute demographic growth must be accompanied by sustainable urban management that attains balance at all levels: social, economic, and environmental. While sustainable development enhances social security and quality of life, unsustainable urban growth leads to less viable and more harmful results. The current urban pattern which is based on a single, detached housing prototype that accommodates only one nuclear family, has to be re-envisioned and modified to be more efficient by integrating high-density urban settlements that are surrounded by

\textsuperscript{44} Gillham, The Limitless City: A Primer on the Urban Sprawl Debate, 2002, 8.  
\textsuperscript{45} Connerly et al., Growth management in Florida: planning for paradise, 2007, 38.  
\textsuperscript{46} Bullard, Growing Smarter: Achieving Livable Communities, Environmental Justice, and Regional Equity, 2007, ix.
basic services, work, and leisure places all in one location. In terms of land distribution, it is the author’s conclusion that now is the time to halt land granting for single detached residential villas in urban areas, particularly in Muscat where land has become so scarce. Activities that may damage the environment and local habitat, such as the excavation of mountains for housing, have to be have to have a moratorium. Tampering with the local environment by cutting down trees, mountains, and terrain could adversely affect the population and public life through environmental downturns, which may lead to an increase in the proportion of environmental disasters, such as floods and heat waves.

What is most pertinent now is to develop thriving public transportation to reduce the use of private cars. Public transport is one of the key system-change approaches for the gradual transition towards being an intelligent or resilient city. This action will not only reduce the number of private cars on the streets but will largely reduce land consumption caused by paving streets and other car-related utilities. On an environmental level, this will lead to a huge reduction in the rate of air pollution and noise. At the social level, this will reduce the rate of car accidents and the number of deaths and injuries. Therefore, this will also lead to reduced fuel consumption which will cut spending on fuel and maintenance. Decentralization is another significant tool that helps achieve a sustainable city. Linking government organizations and companies with a unified system will lead to ease the concerns of investors and people in general in terms of communication; thus it will also lead to cost reduction. Technology can reduce need for land. Since retail and shopping utilities occupy a lot of space in every city, online retail and current advanced telecommunication can help to reduce the urban expansion, in particular for shopping activities. Gillham argued, ‘internet shopping and telecommuting may even have the potential to reduce development pressures for new commercial retail and office space.’

According to the demographic and geographic conditions that have been discussed in this paper, Muscat has to follow an exclusive urban policy to balance its urban growth and social equity. The most important short-term issue is to provide housing for all, which compose about 60% of society. Integrated Tourism Complexes which have never added value for the Omani middle-class have to be halted. In contrast, the recent declaration to launch ‘Integrating Residential Complexes’, a new governmental scheme, has to be push forward for near-future implementation. Mixed-use and high-density residential complexes integrated with an efficient public transport network could be a pragmatic remedy for current urban patterns that have been discussed throughout this paper.

Initiating comprehensive land-use planning becomes essential to regenerate and form compact settlements that are based on pedestrian orientations and incorporate efficient transit with mixed-used development.

It becomes obvious that most of the blame for rapid urban expansion in Muscat and other areas in Oman has been the cause of the outdated ‘Land Regulation Law’, which needs to be reviewed so as to be more pragmatic and fitting to the current and forthcoming

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circumstances. The current urban policy is based on granting vacant land to fulfil the need for housing. Keeping the same policy will eventually lead to the depletion of any remaining land in Muscat. Converting land for owner-occupation means shrinking the amount of land for investment. On a social level, it has demonstrated that the current urban policies do not improve social factors in terms of providing homogenous urban patterns. The existing urban policy fosters dispersing and fragmenting of urban form that leads to decay in social cohesion and family interaction. With the current rate of population growth and limited public resources, maintaining the same urban policies for the next 10 to 20 years will aggravate these problems. It has found that social equity has not been achieved by granting land initiatives at remote areas where there is a lack of infrastructure and basic quality of place. Dwellers in these areas remain without a sense of place and community. The government should set a timeline for developing the vacant plots as part of the recently declared decision that authorizes the government to withdraw undeveloped plots that are owned by GCC nationals. In order to enhance the city’s regional competitiveness, it should be demonstrated that ‘the success of policies attempting to improve a city’s competitiveness and quality of life need to be designed at the right scale – for ‘the adequate territory’ – if we do not wish for the reverse effect to occur.’\[48\] Meanwhile, convening all society’s parties on urban development issues becomes necessity by ‘reforming agreement, pleading the creation by law of a ‘metropolitan community’: regional, municipal, provincial, and federal representatives should sit around the table to sign a cooperation agreement on topics relevant to the metropolitan scale. This would certainly instigate public and private stakeholders to actively take part in a multi-scalar integrated planning process combining both top-down and bottom-up strategies to foster economic and urban development.\[49\] Local authorities have to define techniques to combat urban sprawl and manage rapid urbanisation. Several theories and paradigms around the world offer remedies to these issues, starting with Howard’s Garden City, which aimed ‘to create cities that were efficient yet allowed people to live without all of the clutter and social problems found in sprawling metropolises. He recommended limiting cities to 30,000 people who would also own the community through a type of cooperative socialist framework.’\[50\] The world’s ‘Resilient City’ paradigm could be also a practical intervention for remodelling the urban patterns in Muscat in the upcoming future. The core concept around resilient urban developing is to ‘make optimal use of existing opportunities and translate them into a qualitative and highly diversified urban environment for economic activities.’\[51\] Ultimately, it might be concluded that ‘a successful city must balance social, economic, and environmental needs: it has to respond to pressure from all sides. A successful city should offer investors security, infrastructure (including water and energy), and efficiency. It should also put the


\[50\] Chen, Orum and Paulsen, *Introduction to Cities: How Place and Space Shape Human Experience*, 2013, 3.

\[51\] Casabella and Grulois, *RE: WORK: making place for industry, logistics and wholesale in Brussels centres Louise (ULB) and SteR* (EHB) with the support of the Secretary of State in charge of Urbanism for the Brussels-Capital Region, 2012, 156.
needs of its citizens at the forefront of all its planning activities. A successful city recognises its natural assets, its citizens and its environment and builds on these to ensure the best possible returns.\textsuperscript{152}

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