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URBANISATION IN OMAN – BACKGROUND AND TRENDS

The Sultanate of Oman is located at the south-eastern border of the Arabian Peninsula and covers an area of about 309.500 square kilometres. Of this land the coastal plain amounts to 3%, the mountains make up 15% of the total area and the remaining 82 % is mainly valley and desert land.[1]

The country's average population density of 9p/km² (2010) does not reflect the real situation, as the population is concentrated mainly in the coastal strip. According to the Statistical Bulletin from June 2013 the total population registered in May 2013 was already 3.876.383, compared to 3,623,001 in mid 2012[2]. While the surface of the country is comparable to the surface of Italy, the developable areas are limited and coincide with agricultural land, vulnerable ecosystems and heritage sites. Current urban development is still based on diminishing fossil fuel resources. Population growth, limited land resources and transition to a post-fossil fuel economy pose mayor challenges to sustainable urbanisation in Oman.

Oman has seen a steep population growth corresponding to a high urbanisation rate over the last 45 years. Since the Renaissance[3] of the country in 1970 the population multiplied eight times, from 500.000 to nearly 4 million inhabitants in 2014. Before the discovery of oil and gas in Oman - with the first commercial oil export in 1967[4] - the country relied on fishery, agriculture, animal husbandry, handicraft, and trade.[5] Oman was a rural society, socially organised in tribes and family clans, living in villages and hamlets, mostly oasis settlements.[6] After 1970, when Sultan Qaboos bin Said took power, the percentage

of urban dwellers increased from 47.6% in 1980 to 72.8% in 2010.[7] Population projections show that this percentage will continue to increase to reach 82.9% in 2050.[8] In 2011 73.44% of the total population were considered to be urban and 26.56% rural.

UNBALANCED POPULATION DENSITY

Focusing on Muscat Governorate the average population density increased to 257.4 inhabitants per km² in 2011 and up to 25,000 per km² in Mutrah. Migration plays a vital role in the country. There is rural to urban internal migration but as well international migration, mostly towards Muscat Capital Area (MCA). Although the Governorates of Muscat and Al Batinah represent merely 5.3% of the total area of the Sultanate, they accommodate about 56% of the total population, nearly 28% in each. The 2010 census revealed that 53.3% of the total population lives in the two Governorates of Muscat and Al Batinah, both only covering an area of 16,400 km². (Al Batinah 12,500 km² and Muscat 3,900 km²).[9]

The on-going population increase in particular in the two Governorates, has led to a considerable decrease of agricultural activities in these coastal areas. More and more land is taken for new residential and commercial purposes as well as for national governmental institutions that all concentrate in the Governotate of Muscat. Urbanisation in Oman has been fostered since the 1970s by different driving factors that in particular influenced the area around the Capital City.

OIL-BASED ECONOMY

Increasing oil exports and the newly introduced open market policies stipulated the private economy that expanded considerably. More shops and storage space created a high demand on land. The development of the governmental and administrative sectors coincided with an increase of governmental staff from 1,750 in 1970 to 66,648 in 1985[10], and contributed to further centralisation of the government in Muscat. More and more buildings were constructed for new ministries and administrations started shifting towards vacant land westwards of the city. Both the economic boom and the growing importance of the

governmental institutions created a high demand for housing. New residential areas developed, some initiated and controlled by the municipality, and others through individual private initiatives. The beginning of 'urban sprawl' can already be noticed during the 70s and 80s of the last Century.

Oman recently started to reflect on its depleting oil reserves. During the past decades, however, energy saving was not on the agenda due to the seemingly never-ending fossil resources. Buildings – also residential units - were erected without using "soft" measures to save energy. Skills that have been plentiful in the country for climate-responsive urban and architectural design have been lost. Air conditioning devices are the predominant way of adapting the non-insulated free-standing villas, which are exposed to the difficult climate in the coastal region of Muscat Capital Area, to a comfortable indoor climate for human beings. Apart from the consumption of limited resources, household expenses for electricity are very high and considerably impact families' budgets. The state economy is still based to a high degree on oil, though diversifying the economy has for the first time become the ultimate development goal, promoted in 1995 with the "Vision 2020".[11] Fossil fuels of oil and natural gas in particular are the sole energy source tapped in the Sultanate. Natural gas is used to fire turbines and generate electricity. Desalination plants use energy to separate water from salt. A large proportion of electricity is used to run air-conditioning (AC) units. Without these AC-units no comfortable living is possible in buildings made of hollow concrete blocks. The design of modern Omani villas requires one AC-unit per room. Since both petrol at the pump station and natural gas for combustion in factories, power and water plants is heavily subsidized, there is no incentive for the population to reduce consumption or look for less demanding alternative cars, devices, house typologies and sustainable ways of living. These finite resources also pollute the environment and contribute to global warming. While the absolute number is small due to the number of inhabitants (<3 million in 2011), the respective carbon footprint is astronomical.

CAR-BASED MOBILITY

One major issue has been given attention in all five-year plans concerning the expansion and improvement of the road network.

The priority accorded to roadway projects accounts for high state expenses every year. The length of asphalted roads doubled within 7 years from roughly 15,000 km to 30,000 km in 2011. (NCSI 1012) The long distances between the settlements, the separations of functions in the zoning of Muscat, the absence of formal public transportation require a car-dependent life style. All daily activities ranging from work to shopping, and from education to recreation, require a car. Generally families own several cars. Each family member spends many hours daily in the car either driving or been driven. Commuting comes at the expense of productive time, not counting the impact on the environment. The large distances also lead to social isolation.

Transportation of goods takes place exclusively by road. Heavy trucks are not just a traffic obstacle, but also carry dangerous goods. All potable and irrigation water, as well as wastewater is trucked across the country from the nearest desalination plant, usually on the coast, to the nearest water treatment plant. Besides the long-distance bus lines from Muscat to major cities in Oman and to Dubai, public transport does not play an important role for Omani citizens. The few mini-bus lines cover limited areas and don't cater for the majority of the urban population. School buses and shuttle services by companies and governmental institutions may reduce traffic peaks here and there, but are not a viable alternative to private vehicle ownership. Besides the already mentioned negative outcomes related to the environment, car-based mobility in the long run creates high social costs, caused by traffic accidents, stress, and environmental pollution. Furthermore, it contributes to social inequality as it excludes less affluent non-car-owners as well as the elderly population from necessary and desired mobility.

DEVELOPMENT AND HOUSING POLICY

Policies designed during the past four decades have been focusing on what might be called 'catching-up development'. Development in this sense meant rapid growth and expansion to improve the country's basic infrastructure, social and health facilities, as well as modern government and administration structures, most of which were lacking. Housing policy in particular went hand in hand with overall national devel-

opment policies and tried to meet the growing needs for additional residential areas. Housing policy guidelines have been redefined in detail in 1991 in the Muscat Area Housing Study based on comprehensive surveys. A main goal of the Omani government is to allow all Omani citizens to build their own house. Thus land is granted to them forming part of a public welfare system of the Sultanate. Housing Banks have been established to grant long term loans for construction of new houses or the purchase of existing ones.

The high growth rates plus the concentration of population in the MCA, plus the fact that since 2008 female Omani nationals are also eligible to be granted a plot, have led to long waiting lists for such plots. About 4,000 applications have been registered in only one month in 2011 in Muscat, posing a challenge to the governmental bodies concerned. In order to meet this extremely high demand for new residential plots the government had to find new additional land to allocate, which was located far away from the city centre. People often didn't wait for the plots to be serviced but started to build as soon as possible. This fact contributed significantly to the patchy structures and to a high consumption of land. The non-Omani nationals (who during 2012 comprised more than 50% of the total population in Muscat Governorate) are excluded from the right to own property in the country, except in Integrated Tourism Complexes (ITCs).

Private-sector activities however are essential for the implementation of the Omani housing policy. The land allocation system allows the plot owner to either build up his or her plot right after allocation or to wait two years before he or she may sell the plot on the private estate market. Many plot owners speculate on land. Land prices increase rapidly on the market as soon as the land is to be serviced by roads and other infrastructure. This policy has led to a dual land market, on the one hand land is distributed practically for free and on the other hand land is sold on a highly speculative market.

PHYSICAL URBAN PLANNING AND INFRASTRUCTURE

The guidelines for future urban development patterns were formulated until 2010 in the Muscat Area Structure Plan, taking the given development trends into consideration when

designing future spatial structures. It was decided to follow a functional separation, where areas are dedicated to one function only, be it residential, industrial, administrative, or commercial land use. This generates a need for commuting long distances between residential and workplace, schools, or shopping, leisure and health-care facilities. Furthermore, this approach creates empty spaces during nighttime, when ministries are closed, and workplaces or the banking sector are shut down. The basic unit for the residential schemes is the individual family house covering 40% of the private plot. Low residential densities are the result.

Urban planning and technical services planning and provision are closely interlinked. In the majority of the new residential areas fresh water is trucked to the buildings. The water is pumped into tanks on top of the buildings. These tanks simmer in the heat, reducing the water quality. Wastewater is stored in septic tanks to be emptied on a regular base. The leaking sewage contaminates ground water and pollutes dry rivers. Illegal wells with electric pumps drain the ground water. The depletion of ground water levels damages traditional irrigation systems and destroy oasis plantations.

Urbanisation has been furthermore accelerated through social changes in the Omani society initiated through the opening and modernisation process that rendered tribal structures less important, capable to support individual professional careers and personal economic success. Rural-to-urban migration began as tribal living patterns dissolved and 'modern' life-style patterns took hold.

FAMILY AND LIFE-STYLE PATTERNS

Residents' life style patterns have changed from the traditional life in oasis settlements, farms, fishing villages and port towns that were predominant before the 'Renaissance' of 1970. The car-based mobility and communication devices, but also the ubiquitous availability of electricity and water, have fundamentally changed the social fabric.

The changing life-style patterns have a negative effect on the social fabric of the Omani society. Due to the re-distribution of the population, extended families break up into nucleus fami-

lies. This also disrupts traditional clan structures. Ultimately, the changing life-style patterns create a modern Omani society, albeit not a sustainable one.

The individual resident and his/her family probably play the most passive and conservative role within the whole process of urban development. The individualisation of families on their walled-in plots is seen as the best way to assure the highly esteemed privacy. People are reluctant to embrace any kind of co-housing schemes, which are accepted as social housing patterns for low-income populations, but not as suitable for the middle class or the more affluent parts of the population.

The freestanding villa, as prescribed in the ruling building regulations, has been internalised as the house type that all families are looking for. State and private housing banks also propagate the villa. People accept high costs of energy to cool down their properties and don't invest into better insulation. Many people are not aware of environmental stress that is caused by that type of construction and the related life-style patterns. Citizens assume no responsibility in return for the land allocated to them.

The fact that a car is indispensable in an area, where one finds neither schools, shopping and health care facilities nor ones relatives and friends close by, causes inconveniences that seem inevitable to the citizens.

Mobile communication devices have changed the way people socialise. Mobile phones amount to two or more phones per resident in the Sultanate. Recently social media and instant messaging services have increased the volume of data exchanged via the mobile Internet. Due to the long distances, certain meetings do not take place in person anymore. Thus, people segregate even more.

MUSCAT CAPITAL AREA – SPATIAL DEVELOPMENT

In 2009 the capital area of Muscat covered the coastal strip of about 5 to 8 km width between the sea and the Hagar Mountains for a length of about 50 km between Mutrah/Muscat in the east and Seeb in the west. Assessments of aerial photographs and high resolution satellite imagery, covering the

years 1960, 1970, 1980, 1990, 2000 and 2003 revealed that the area of Greater Muscat expanded by 650% in the period 1970-2003 with an annual growth rate of approximately 20%.[12]

At the same time not only existing urban areas –mainly along the coastline- were expanding, but also rural to urban transition occurred in the inner mountain regions. There the traditional land-use balance between limited irrigable land for agriculture and less precious land set aside for settlement purposes, is widely threatened or even already destroyed.

Agriculture-based income structures are transforming and thus accelerating rural to urban migration. This goes in parallel with a decline of complex rural eco-systems again fostering the progress of urbanisation.

In 1973 Muscat/Seeb International Airport was opened. The coastal road opened in 1974, called "Batinah Road", connecting for the first time Muscat via Seeb to Sohar and encouraging new settlements along this road, which was upgraded after 1980 into a 4-lane highway, then named Sultan Qaboos Highway.

This highway is one backbone of the strip-like urban development that started in the 1970s. In 1985 the government had started to develop six new residential areas offering a total more than 14,200 new plots; for example 1,200 were located in Ghubrah South, 1,200 in Khuwair South, and 910 in Azaiba. (see Scholz 1990:133)

Land distribution followed the regulations laid down in the Land Law of 1984 and its amendments in the following years. Land dedicated to residential development is generally divided into plots of 600 sqm. Very often in recent years, the plots essentially stayed subserviced for a long period. Plots are distributed by lottery to persons who are eligible.

This procedure developed in the early 1970s to implement a social welfare system of land granting to Omani citizens, but nowadays is hampering social equity among the urban Society: land is only given to Omani nationals and non-nationals are not allowed to possess land except in Integrated Tourism Complexes (ITCs).

A number of governmental institutions (Ministers' Council, Ministry of Higher Education, Ministry of Transport, Ministry of Regional Municipalities, Ministry of Water and Electricity, Supreme Committee of Planning,) are involved in urban policy and decision-making, planning and implementation. Unfortunately, coordination among the entities concerned is low. Areas that have been selected as new residential zones for years remain without basic services. Even roads are not always constructed after people have moved into their new properties, let alone social services such as schools, health, sports and leisure facilities.

Urban development goes virtually unmonitored. Once the plot has been allocated it is up to the individual plot owner either to develop his/her land or to wait for a value increase and sell it on the private land market. A huge amount of plots are kept undeveloped for long periods and contribute significantly to sprawl.

The real estate market is booming and the demand for rental housing is increasing constantly, in particular within Muscat Capital Area. What was initially meant as a welfare policy has turned into a profit-oriented market–led urban development, out of public control.

The urbanisation process of Muscat Capital Area is based on a comprehensive structure and urban design plan produced by Weidleplan in 1991. [13] Key documents are the Muscat Area Structure Plan, including maps for the Strategic Road Network 2010 and Major Land Use 2010. This planning framework had a target of twenty years up to the year 2010 and can be considered more or less achieved to date. The aim of this strategy was to locate future citizens around As Seeb in order to create a second centre in an attempt to decentralise Muscat area. Massive zones were allocated for residential land use such as Mabailah, Mawaleh and Al Khoud. Another center under development is Al Amerat across the mountains south of Muscat. All major roads, neighbourhoods and infrastructure envisaged in 1991 are now completed.

The resulting urbanisation is similar to processes recognised by Neuman in Western cities:

"Urban sprawl results from the confluence of several factors: the lure of cheap open land outside the city, advances in transportation, easily available capital to buy property, the rise of the real estate developer, mass production of housing, and the always-present image of the single family home."[14]

While Weidleplan's Muscat Area Structure Plan was a child of the 1980's zeitgeist of prevailing expansion and advancement in technology, its design was not updated nor revised in five-year cycles as initially anticipated. This could have limited the damage of relying on a single planning strategy, considering the large expenses of land, energy and other resources necessary for its implementation.

PHYSICAL AND ADMINISTRATIVE CONSTRAINTS

Understanding the particular growth patterns of Muscat one has to consider its physical setting and topography. Muscat Capital Area is facing certain constraints that also foster the vast expansion of housing areas. Some restrictions to land use for settlements are related to natural conditions such as inhabitable mountains, valleys (wadis), and flood-prone areas. The narrow strip between the Al-Hajar mountains and the coast of the Golf of Oman has set a precondition for the ribbon-like development that Muscat took during the past decades. When the latest structure plan was elaborated in 1991, expansion areas had to be designated far away from former settlement cores because of land claimed by governmental institutions, for certain purposes of the Ministry of Defense, for the Petroleum Development Company, or for extension of the international airport. Other areas had already been allocated i.e. to the Sultan Qaboos University, or formed part of Diwan and Palace properties. These restrictions contribute to a considerable east-west extent along the coastline.

Urbanisation patterns in Oman are characterised by dispersed and patchy settlement structures, not only in the urban expansion areas of the Muscat Capital Area but in the areas of rural to urban transition as well.

Patterns of urbanisation in rural mountain areas follow the patterns of urban expansion. Disperse settlements consisting of single villas on extended plots are sprawling around the widely abandoned traditional residential structures. Former compact settlements in balance with limited land resources, following a climate-responsive urban layout and building types and not depending on long distances to commute are rapidly disappearing.

Most modern settlements in Oman however are made up of detached dispersed building blocks with wide grid streets facing severe climatic and environmental problems. Neither the urban layout nor the building design copes with the requirements of the climate and environment. The process of urbanisation at the outset of this study in 2010 was far from sustainable. It became evident that the multifaceted and interlinked spatial transformation has, and will continue to have, a lasting impact on the future of the Sultanate. Given the concentration of economic, social, political and environmental aspects in urban and rural-urban areas of Oman under diminishing resources the study of urbanisation is more urgent than ever.

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