NO URBAN DESERT! EMERGENCE AND TRANSFORMATION OF EXTENDED URBAN LANDSCAPES IN OMAN.

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Figure 1: Temporal development of Muscat Capital Area 1984 – 2014 (von Richthofen and Langer 2015)

If 'urban jungle' was an adequate metaphor for expanding cities, then 'urban desert' might appeal as the equivalent for a process of extensive urbanisation in Oman. At first sight the larger metropolitan area of the capital Muscat seems like an endless monotonous sea of self-standing villas.

Like the metropolitan area, the landscapes of Oman ranging from the coastal plains of Al Batinah, to the plateaus of the Hajar Mountains, to the old cities in the Interior, the deserts of the Empty Quarter and beyond are subject to recent, dramatic changes. Multiple factors drive these changes induced by the discovery of oil in 1965, the gradual development of the economy since 1970 and followed by a demographic explosion thereafter. Housing for the population growing at 3% annually and provision of infrastructure in form of roads, ports, airports, schools, hospitals and mosques became a national planning priority (Development Council 1976) and the measure of progress as well as public satisfaction with the rule of the Sultan. Today, these processes manifest in an endless proliferation of individual residential houses sprawling across the Omani landscape and can be subsumed under the process of extended urbanisation as conceptualised on a global scale by (Schmidt and Brenner, 2014). The urban geography of Muscat Capital Area has been studied by (Scholz 1990) whilethe process of urbanisation and its effects on urbanised areas, urbanising areas and areas beyond have been researched by (Nebel and von Richthofen, Aurel 2016). As the research scope expands the definition of urban and rural in the Omani context need closer attention.



Figure 2: Monotonous urban sprawl in Al Batinah, Oman

Oman's urban turn

The description of rural-urban dynamics in Oman starts with methodic questions of how to define the terms urban and rural in Oman? Following from there we can ask how much space is urban in Oman? Yet, the definition of what an urban area actually is poses challenges in Oman and elsewhere (Brenner 2014, 181ff). According to the (UN HABITAT 2012), 85% of the population of Oman lives in urban areas, yet occupy only 3% of the Omani territory. The high urbanisation rate arises from a very low threshold index of 2000 inhabitants that qualify an area as 'urban' within the UN statistics for Oman (as compared

to 100.000 for other places). It would be wrong to conclude that the remaining territory is therefor non-urban or 'rural'. Large parts of Oman including mountains and deserts are nearly uninhabited and could be considered naturally wild rather than 'urban or rural'. But even if these territories are excluded from the study and the remaining territories considered subject to permanent human interaction it would also be wrong to concluded that this urbanisation process occurred unilaterally from isolated urban centers towards rural areas.

Since the opening of the country to the global market following the discovery of oil in 1970

and subsequent economic development, the government of Oman has pushed investment and planning strategies. In the Sultanate of Oman economic development is necessarily linked to spatial development. Indeed, the beginnings of the Omani urbanisation predated 1970 and were largely located outside of the core urban space of the few coastal port cities. A study of US and Soviet military maps dating 1945, 1964, 1973 and 1975 based detailed explorations and earliest satellite imagery reveals that the present metropolitan area is preceded by a dense network of interlinked rural communities of coastal and hinterland oasis'. The larger case-study area shows a 'compressed' temporal development due to the fast and immediate transformation from rural state into extended urban state. The urban morphology developed along these lines into the present urban form of Muscat Capital Area as (von Richthofen and Langer 2015, 6) showed. Development of a modern economy and industry relying on an urban infrastructure therefore had to first reconfigure the rural space into urban space for the economy to unravel.

Steffen Wippel described the spatial turn in Omani politics as a "political, economic and social dynamics of region-building [contributing to a] broader understanding of regions as social constructs and of processes" (Wippel 2013, 22). According to Wippel, the socio-economic development of the country contributed to the construction of regions through a shift to spatial practice. The spatial transformation of Omani landscapes assign them a supportive function in the modern vision of Oman. This economic-spatial transformation also overcomes traditional tribal structures and builds a modern Omani society wherein housing becomes a key strategy to secure the social contract. In extension of the spatial turn, I would like to propose that the Sultanate of Oman is undergoing a rapid urban turn since 1970 that accelerated since 1990 as the focus of state-orchestrated development measures put the 'urban' in the center of attention. Oman's urban turn therefor is a radical transformation of the Omani landscape, based on a pre-existing 'blueprint' of interlinked rural communities and economies. Yet, this process has not resulted a homogenous urban space, but in a complex process of urban emergence and expression out of rural roots - a reverse process of 'ruralisation'.

Learning from oasis settlements

The rural roots of the present day metropolitan Muscat Capital Area can be found in the network of oasis settlements and trade hubs scattered at relatively even distance in the AI Batinah region. Two types of settlements can be distinguished in this pre-oil situation that remained unchanged till 1970. Both types are intrinsically linked to the hydrological conditions of the region. Fresh water sources can be found at the foot of the Hajar mountains at the point where wadis (dry river beds) enter the Al Batinah plain. Water was collected by water channel and distribution systems (falai) and used for drinking, cleaning and irrigation. The first type of oasis settlements along the mountain ridge based on falaj technology can be found here (Siebert, Nagieb, and Buerkert 2007, 3). As the fresh water disappeared underground it eventually contributed to the ground water table at various depth below the gravel plain of Al Batinah. Upon meeting salt water intruding from the sea, the lighter fresh water was pushed upwards so that a second type of settlement was possible along the coastline (Zekri, Al-Rawahy, and Naifer 2011, 5). These coastal oasis' relied on wells powered by animals to pump fresh water on the surface and irrigate the fields. In a cross section perpendicular to the coastline towards the mountains reveals the correlation of hydrology and settlement patterns. These settlements were interrelated by trade links and

depended on each others produce and commerce (Nagieb and et al 2004). Each coastal settlement had a counterpart on the mountain edge and the system proliferated like a lattice across the Al Batinah plain. Certain places eventually gained moderate power over a larger region to become centers within a hub and spoke system. The size of each settlement as well as the density of settlements across AI Batinah was given by the amount of water extractable over longer periods of time and therefor the number of inhabitants it could support. This natural limit also meant that the largest regional center Muscat counted barely more than 10.000 inhabitants prior to 1970 while the total number in Al Batinah was estimated at more than 200.000 (Korn and et al 2004). The inhabitants lead labour-intensive and demanding lives, but had achieved a circular and sustainable economy. While the present number of inhabitants in this region has increased 10fold since 1970 and is now close to 2 million a return to such an idyllic past is neither possible nor desirable.

The spatial configuration of the built-environment as well as the configuration of settlements within the extended network was, in the past, directly dependent on water management and the resulting agricultural production. Scholz (1984, 273) identified fundamental structural correlation while studying the oasis settlements of Dariz in the Omani Interior. These particular oasis' were fed by a long falaj and 'sunken' into the relatively featureless gravel plain. Thus these particular settlements were planned from scratch by their inhabitants, designed without external factors interfering the 'ideal' layout and completed according to the optimal use of available resources. For Scholz the spatial layout of the oasis was dictated by the best use of the scarce resource water. Within the spatial configuration of the settlement water was used sequentially first for drinking, second for cleaning and third for irrigation. This multi use of water also resulted in a multi use of space with dedicated extraction wells, washing places and irrigation channels each sided by dedicated communal spaces. Both usage patterns of water and space followed sequential functional cycles to maximise the efficient use of these resources. Space serviced with fresh water and prone to agriculture was equally scarce as the fresh water itself. These oasis' represent the latest form within a long tradition of planned agricultural settlements; the culmination of pre-oil technological, agricultural and urban co-evolution. The sequence of uses can also be studied in oasis' settlements on the foothills of the Hajar mountains of Al Batinah, such as Halban. Thus, in these settlements, the availability and functional distribution of fresh water resources gave rise to equally precious spatial resources usable for agricultural production and inhabitable space. This overlap of hydrology, agriculture and architecture is the blueprint for a sustainable urban-rural network. A visit to the site in 2016 revealed that the symbiotic relationship of water management, agriculture and the built environment yield the potential for adapted and sustainable development strategies for Oman originating from rural networks.

Changing rural spaces

As studied by Nebel and von Richthofen (2014) the rural-urban interface in the Al Batinah region produces both urban enclaves as extended rural systems. On one hand, the urban enclaves are new settlements planned from scratch and developed solely to house the growing number of inhabitants without consideration for the management of scarce resources of water, land and energy. On the other hand, the extended rural systems develop out of former agricultural settlements gradually devoid of their productive agricultural function as nucleus of new housing settlements. Both forms converge and contribute to the formation of the present metropolitan area

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Figure 3: Halban oasis settlement in Al Batinah, Oman

as a functionally segregated, energy demanding, inefficient and unsustainable region. As studied by (Al Shueili 2015) the administrative system and planning framework currently accelerate this process with incentives and subsidies in form of land-allocation low mortgages. (Al Gharibi 2014) adds that social and cultural factors like the perceived need for representation and privacy as well as the economic and political support encourage space-wasting architectural typologies like the 'Omani villa'. This self-standing and space-consuming houses transform the landscape despite obvious climatic disadvantages.

The proliferation of the 'Omani Villa' had consequences beyond aesthetic far the component of urbanisation as studied by (von Richthofen 2016) in the comparison of the urbanisation of Muscat Capital to an extended 'mass-ornament'. The need to serve both urban enclaves and extended rural systems with road access and electricity, changed the intermediate landscape even further: Dry-river beds were dammed up-streams, mountains cut and valleys filled-in to make way for roads, topography leveled to create convenient industrial spaces (von Richthofen 2015, 98). Unique archaeological and historical monuments like the bronze-age tombs are being lost forever (Cleuziou and Tosi 2009, 29). The scarce agricultural land is overused and then neglected and often converted into building lands (Zekri, Al-Rawahy, and Naifer 2011, 12). In the eyes of the planners and decisionmakers the dry gravel and stone landscapes of Al Batinah seem to have no monetary value and can be manipulated at will. An interview with the Ministry of Housing, Oman revealed that neither surveys nor feasibility studies precede the design and development of housing zones. This growing disconnect between planning and resource management is destructive, irreversible

and not sustainable.

Since the beginning of modern spatial planning with the adoption of the first 5 year plan in 1970 housing and later urban planning has been given priority over development of agriculture, water and energy-management. In a seemingly deserted country land-resource management was not perceived as a priority. The (Weidleplan 1991) planning strategy separated the interlinked aspects of water management, agricultural and industrial production and land resources. As a result, the hierarchy of planning and housing over resource-management further structured the 'functional' layout of the city. The ONSS (Constatt Ltd and Supreme Committee of Planning 2014) spatial strategy did not offer further insights to this. Throughout the planning legacy of modern Oman economic development in general and that of urban areas in particular depended on rents from fossil resources. As seen in the sharp fall of oil prices in 2015, this financial resource might be worthless even before it becomes exhausted. Indeed, Oman relies like most of the Gulf States on oil-based revenues. If the dramatic changes in rural spaces were not sustainable so far, they are now no longer affordable.

Sustainable landscape in Oman

The study of rural transformation in Al Batinah reveals that processes of extended urbanisation in Oman are guided and based upon pre-oil, preurban, agricultural patterns. These patterns still exist to a large extent today even though they have been partially over-built and transformed. Furthermore, the study of late oasis settlements in the Omani Interior offers insights on the correlation of resource-management and spatial configuration. This knowledge can be gathered by reexamination of the water-agriculturespace paradigm and mobilised for sustainable development. This paradigm implies, under



Figure 4: Extended urbanisation in Oman: The urban-rural interface Fanja, Al Khoud



Figure 5: Wounded landscapes in Oman, 2016



Figure 6: Sequential use of space illustrating the water-agriculture-space paradigm

the rural precedent, a productive agricultural component that could be extended to production in a more general sense under the extended urban; the production of renewable material, food, energy, social-capita, etc. in conjunction with the development of space. This formula requires slow and gradual growth.

Yet, given the current development pace and lack of integrated planning, the fragile rural-networks in Oman and the knowledge how to manage their resources are at risk of being depleted and lost. As shown above both challenges and answers to the problem of sustainable development for the Al Batinah in Oman and arid regions beyond lay in the comprehensive planning of rural areas. A re-valuation of rural over urban qualities would also lead to a reversal of the planning hierarchies that currently prioritise resource consumption over resource management. A reverse process of 'ruralisation' as the expression of complex processes of urban emergence could be the way forward towards sustainable landscapes in Oman. Acknowledgement: The fieldwork and initial research was conducted in Oman from 2011-2014 under a research grant by The Research Council Oman CBS-ORG-09-001 with Dr. Sonja Nebel.

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