TU BERLIN CAMPUS EL GOUNA

Petroleum Cities

A Case Study of Ras Gharib

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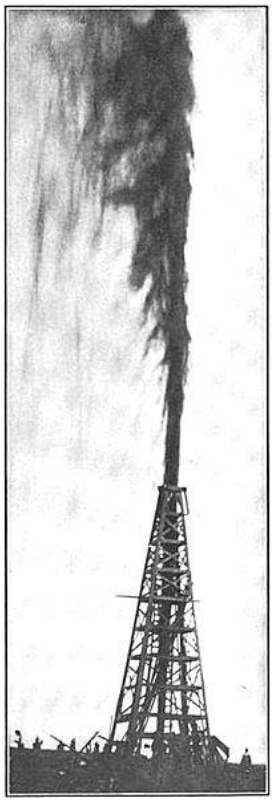

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(*) Image on cover: Lucas Gusher, Spindletop, Texas (Source: Kjell Aleklett)

FOR MY FATHER

fortis fortuna adiuvat

Declaration

I declare that this thesis is my original work conducted under the primary supervision of Professor Uwe-Jens Walther and secondary supervision of Dr. Anna Steigemann. All sources used in the dissertation are indicated by special reference in the text and no part of the dissertation has been submitted for any other degree. Any views expressed in the dissertation are those of the author and in no way represent those of the Technical University in Berlin. The dissertation has not been presented to any other University for examination either in Egypt or overseas.

Cairo, March 2, 2018

Signature: 

Acknowledgement

This work comes at a turning point in my life; the crowning jewel for a very long and tiresome path that I have taken for myself in defiance for a great deal of things. Along this path I have been blessed with people who had been like beacons of hope to me, showing me that what I have been doing was not in vain. I would like to thank Professor Uwe-Jens Walther for believing in me and accepting to be my supervisor. His inspiring character and profound knowledge and incredible patience helped me through a lot of terrible times. Thanks are due for Dr. Anna Steigemann for lending her time and effort to my work. I would also like to thank current and former staff members of the Urban Development Department at TU Berlin Campus El Gouna for their dedication and support: Professor Schaefer, Hassan Elmouelhi, Tooska Mosavat, Felix Hartenstein, Eslam Mahdy, Martin Meyer and Raffaela Betz. I must also say that I am deeply obliged and indebted for Lukas Born, the former Coordinator of the Urban Development Programme at TU Berlin Campus El Gouna, for his support and advice. I would also like to thank my colleagues for making the journey a lot more bearable.

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Abstract

This study examines the lifecycle of boomtowns in extractive industries through the examination of the life of petroleum cities. The economic and social dimensions of this phenomenon and its impacts on the residents and their surrounding environment is measured in the aspects of mobility, provision of services, demographic impacts, impacts on the physical environment, and governance. This matrix is used to examine three case studies: Houston, Sekondi-Takoradi, and Ras Gharib in order to determine their location on the Boomtown scale. The study concludes with a discussion of a tentative scenario for the remediation of the Boomtown Syndrome in Ras Gharib.

Keywords

Boomtown

Boom-bust Cycle

Resource-based economy

Extractive industries

Petroleum

Prospecting

Concessions

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List of Abbreviations

AEOC	Anglo-Egyptian Oilfields Company
BP	British Petroleum
CAPMAS	Central Authority for Public Mobilisation and Statistics
EPA	Environmental Protection Agency
ETJ	Extraterritorial Jurisdiction
GAPA	General Authority for Petroleum Affairs
GNPC	Ghana National Petroleum Corportation
GOPP	General Organization of Physical Planning
GPA	General Petroleum Authority
GPC	General Petroleum Company
HHA	Houston Housing Authority
LIHTC	Low Income Housing Tax Credit
NASA	National Aeronautics and Space Administration
NGO	Nongovernmental Organisation
NOAA	National Oceanic and Atmospheric Administration
STMA	Sekondi-Takoradi Metropolitan Assembly
TMC	Texas Medical Center
TML	Texas Municipal League

1. Introduction: Aim, Scope and Format of this thesis

Resource-based economies have effects on the locations where they are based. In many cases the discovery of one particular type of economic resource, like petroleum or precious metal, has led to the influx of capital and labour to remotest places which have been desolate or rural with little or no population service. This had been observed in the American West with the California Gold Rush, Texas with the discovery of petroleum, the Arabian Peninsula with the discovery of petroleum as well, and in many other locations all over the globe.

As a consequence, Petroleum industries can provide an example of this urbanisation pattern, called for the sake of simplicity 'Petroleum Cities' here. For such Petroleum cities can be seen as a typical example for the special features and shortcomings of such a type of urbanisation: The extraction of petroleum from the ground, the processes it undergoes to extract the variable economic components of the ore, and the production and manufacturing of intermediate and final goods from it, as well as the production of fuels, constitute together huge industrial processes usually in cascade formation. These processes act as anchors for other economic activities in the locations where they are settled. The presence of amble economic opportunities in these locations attracts investments, services, and ultimately retains population, which in turn attracts service providers, opens up the service economy, and so on. The rapidly increasing population and demand for services make it hard for supply to catch up - taking into consideration the very basic state of those services before the discovery of such resource. This leads to the deterioration in the quality of services, to inflation of the prices of services and commodities, and finally to out-migration of the original citizens who are not able to tap into the benefits of the resource-based economy and hence could not cope with the new prices. Housing can be an example for this cycle, as with the start of the inflow of capital and labour, there is a sharp increase in demand for housing with limited stock. Increasing the volume of the housing stock takes time. This leads to increased competition and hence increased rents on one side, and on the other side those who could not cope either from the original residents tend to settle for lesser quality that they were used to. Finally, those who cannot cope - especially from the original residents - opt for leaving.

For these reasons of growth, such cities that sprang around resource extraction and processing locations came to be known as boomtowns. This phenomenon has been witnessed in different places around the world and was not solely attributed to petroleum, but also to other economic activities, be they extractive, productive, or commercial. Some of these cities rise sharply and drop after they reach a peak while others plateau after reaching a certain extent in development. There is also a group of boomtowns that exhibit contraction or even obliteration of urban population. This cycle is called the *Boom-Bust cycle* or *Boomtown Syndrome*. In this thesis, these patterns will be studied in relation to the discovery and processing of petroleum in three cities; these case examples are Houston, USA, Sekondi-Takoradi, Ghana, and

finally Ras Gharib in Egypt. In the former two examples, the cities had substantial urban masses before the advent of petroleum based on other economic activities like agriculture and transportation. However with the discovery of petroleum in their vicinities both cities were catapulted into national and international sphere of interest. Houston represents the mature version of a city impacted by petroleum since its discovery in huge reserves in nearby Spindletop around the turn of the 20th century. Since then, the city served as an anchor for national and international businesses working in the field and with time, it became the fourth most populous city in the United States. On the other hand, Sekondi-Takoradi is considered a newcomer to the petroleum arena though the government and the society is anticipating change. Ras Gharib differs from both cases. The city did not exist before petroleum. It started as a labour camp run by the Anglo-Egyptian Oilfields Company until it was incorporated as a city by the Egyptian Government in 1962. And even though it is home to almost two thirds of Egypt's petroleum extraction processes; however, contrary to other petroleum production centers around the world, it failed to retain a population of more than fifty-six thousands.

It is the aim of this study to extract lessons from other cities like these that attributed their growth to the discovery of petroleum, and compare it to the situation in Ras Gharib, and try to diagnose how the Boomtown Syndrome has affected the city. This comparison will shed light on the organizational structure of the petroleum industry encompassing the public and private sectors and how it was reflected in city life in Ras Gharib in particular. Finally, the study will examine the potentials of Ras Gharib in fields other than petroleum in order to provide a roadmap for an ex-petroleum future.

In more general terms, the thesis intends to focus on boomtowns as social phenomena. It attempts to look at the nexus of economic and political reasons as well as the institutional framework pertaining to the governing structure of the resource extraction and processing industry, as well as the impacts it has on the residents in these cities and towns. ‘Petroleum Cities’ as a title is meant to indicate that the study is about cities that sprang from, and around, petroleum extraction. However, it can be seen as a particular case of the boomtown syndrome. In fact, it is the contention of this thesis that Petroleum Cities are one of the main types of Boomtowns.

This thesis aims to accentuate the core features that are pinpointed by the research work and literature on the Boomtown syndrome so far, taking Ras Gharib as a typical example. The main question around which it revolves is how much of the Boomtown syndrome has Ras Gharib got?

Given these intentions, the format of the thesis is as follows:

- The first chapter attempts to dissect the above mentioned array of cities as typical boomtowns. Essentially, this chapter presents the results of literature research. It will conclude by giving the typical features of

boomtowns/petroleum cities in order to define the symptoms of the Boomtown syndrome (like e.g. typical trajectory/ growth pattern etc..)

- The following chapters of the thesis will link this diagnosis and case history of the other cities to a more or less definitive diagnosis for Ras Gharib.
- Finally, the last chapter will concentrate on policy recommendations. It will give a summary and, by way of conclusion, it attempts to sketch out a tentative therapy to prevent, avoid, or compensate for, the most common shortcomings.

2. Review of the Literature on Boomtowns

2.1. Boomtown

Throughout history, the proximity of an economically feasible resource is a characteristic of human settlement. It enables people who live in a certain destination to fund their way of life and get the other things they need which they cannot grow, extract, build or hunt for in or around their settlement through trading. In some settlements, the whole reason behind the establishment of the settlement was the utilisation of such resource. The urbanisation of such locations is directly proportional to the feasibility of this utilisation, and a certain degree of stable urbanisation– or a plateau status – is achieved when the amount of wealth generated due to this utilisation is in equilibrium with the needs of the local population (Reid 1966).

Apart from these more general features of settlements, the historically more specific phenomenon of boomtowns requires further exploration. The proximity of the location of the resource to urban population has an important impact on the manifestation of the boomtown effects (Reid 1966). Historically, oil and gas extraction in North America for example took place in remote areas, also as of the 1940's, oil exploration in coastal areas commenced. Recently there has been a growing number of oil drilling operations in urban areas. For example Los Angeles County in California has 5000 active wells (Ruddell 2017). There are also several definitions for a boomtown that mainly revolve around the surge in population. According to US Census Bureau data for 2016, four out of five of counties with most rapid population growth rates in the United States were sites for vigorous petroleum exploration in North Dakota. However, due to the chaotic housing situation in the beginning of the boom phase, relying on population data may not be very accurate; this is mainly because many incoming workers settle for housing arrangements that do not regularly fit, like renting out garages from homeowners, living in their own vehicles, and shared accommodation. Also, a considerable number of workers in the petroleum sectors in those boomtowns may live in housing quarters provided by the investor – man camps. These are generally located either outside or on the periphery of the existing urban masses and hence may not be included in the census data.

In the literature, the term *Boomtown* usually refers to a city or town that had undergone a rapid growth due to the sudden introduction of an economic stimulus, usually the discovery of a natural resource or precious metal. Those towns are either created from scratch around or near the site of discovery or they have existed before but their growth was much of an average. The location exhibits high influx of migrant labour and investment. Some of the research literature tries to distinguish boomtowns from other towns through the sheer rate of growth, with various authors denoting the rate at 6 percent to 15 percent (Ruddell 2015). This increase in population is fast on its onset with the limitation in the physical structure of the settlement as the rate of physical expansion does not initially conform to the rate of population growth, which leads to a situation of limited supply of services and commodities faced by increasing

demand, crowdedness, chaos, and soaring prices due to competition for existing stocks. Over time, the situation tends to move back into equilibrium with the rising prices luring more investment towards correcting the supply and demand curves. Depending on the nature and reservoir of natural resource being exploited, or the nature of economic activity which earned specific towns or cities their boom status, the growth rate tends to plateau at this equilibrium level until the natural reserves are depleted or the economic activity(ies) moves elsewhere. Then, the growth rate tends to decrease with time or even the location loses its population if the economic base was not diverse enough to support the population after the cessation of activities relevant to resource extraction and processing.

The Boomtown is not a new phenomenon, albeit one which has not been fully studied yet. The very few examples that come to mind when referring to Boomtowns are those of the American West during the California Gold Rush. Cities like San Francisco rose sharply from a minor port with a population of 1000 residents in 1848 to a bustling town of 36,000 in 1852 (CSU 2002). Throughout its duration, the Gold Rush increased the population of California by 300,000 new settlers who came by land and sea from across the continental United States, Latin America, and even across the Pacific Ocean from China and Australia. This influx of people and money helped catapult California to statehood without going through the territory status. However, initially there was chaos as there was no established legal system to ratify the claims each one of the prospectors for gold would have for the land they work and settle on. It also meant that the native people who had lived in the area for millennia were forced off their lands by the newcomers who would work up the lands and rivers looking for gold. The natural environment, too, was affected and rivers were polluted. However this initial chaos was resolved by the development of specialised services needed by the newcomers and their economic activity. It had also led to the development of much of the Continental United States along the transportation lines that carried the prospectors from the eastern states to California through the provision of services and commodities needed for the march to the west. It had also left some marks on the cities of the West Coast of the United States from the demographic point of view; the majority of the prospectors who came to that part of the country were men, this created an imbalance in the male/ female ratio. Seemingly far-flung socio-cultural effects followed, because with this shift, homosexuality found roots in cities like San Francisco where men would seek paid sexual pleasure with women and other men alike. For instance, San Francisco was the first American city with an openly gay mayor more than a century later. With the depletion of accessible gold reserves the successes of prospectors came to a grounding halt. With this, a reverse migration happened in some of the locations that did not have any other economically feasible attractions, which left them as ghost towns.

Similar developments occurred around sites of extraction of coal, petroleum, and – later – natural gas. The 19th century witnessed the commercial discovery of petroleum in the United States and Canada. In the case of the United States, while digging for

water, a prospector happened to come across petroleum reserves in rural Pennsylvania. Later, that site developed into a township called Oil City. The technological advances in petroleum distillation created a wider range of usage for the extracted oil and increased the demand for it, hence increased investment in it and lured more people to move to nearby areas in order to secure jobs. The rush for oil had its permanent mark on the land as at the earlier stages there was no safe way to store oil. So it was stored in large pits in the ground that were not adequately insulated in order to prevent seepage into the surrounding environment and contamination of the groundwater. The process also initiated a cascade of the so-called 'land grabbing' as anyone with access to the reservoir was allowed to tap into it and extract the oil. This created a situation where smallholders were bought off their properties by investors with access to sizable bursaries and the pressure for increasing prices of services due to competition, inability to access the job market of the petroleum extraction industry, and the overall degradation of the quality of rural life they were used to. The result was similar to what happened in England around the time of the Industrial Revolution as smallholders had to give up their land possession off which they had lived for many generation based on subsistence farming. The openness of the petroleum extraction market in the United States and Canada to competition allowed it to be dominated by the private sector investors who had mostly established their wealth in other economic sectors. However, this caused a situation where the capital needed for investment would not be maintained at a certain location, or even it can be remitted elsewhere with no sustainable investments being made into the towns and cities where petroleum extraction took place.

This dominance of private sector investors was – and still is – the case of petroleum-dependent urbanisation; private capital showed more flexibility in following the trail of petroleum developments. However, the scale of which received an very important boost around the turn of the 20th century with the discovery of petroleum in the Spindletop salt dome near Beaumont, Texas. The iconic gusher that shot oil 50 meters up in the sky for 9 days – an estimated 100,000 barrels of oil per day - was the dawn of a new era of the petroleum industry. Soon the image of that gusher circulated across the United States and the world and people and money started flocking to Eastern Texas and the Gulf Coast. The land grabbing occurred again in Beaumont and derricks were installed in every possible location to the extent that it was common to say that one could jump from one derrick to the other for a mile without having to set a foot on the ground. The abundance of the petroleum in Spindletop and the ease of extracting it ushered in more investment in downstream activities like refineries and petrochemical industries. This led the establishment of huge petroleum-based industrial complexes in Eastern Texas especially around Houston, with its access to the Gulf of Mexico which allowed for easy transportation of crude and other petroleum products by sea. Houston, which started at the time, had been around for only 70 to 80 years, was transformed into a petroleum boomtown.

2.2. The Boomtown Syndrome

The social and economic changes that occur in a Boomtown have various manifestations, medically speaking they almost resemble the cardinal symptoms of a disease or a syndrome. Many of these changes have something to do with people, money, culture and lifestyles moving in and out of the affected locations. Change starts with prospectors arriving on site after speculations of finding petroleum – as an example – or some inhabitants actually finding it by mistake like it used to happen in the 19th century. However, around the turn of the 20th century the process of prospecting was enhanced due to increased knowledge in the fields of geology and drilling technology. The process started with prospecting teams composed of businessmen, geologists, craftsmen, foremen, and other classes of workers moved in with their machines, tents, supply wagons and so on in order to set up camps and start their work. Most of the time they come from distant backgrounds as the rural or desolate situation at hand does not provide the opportunity for the acquisition of the necessary skills to be working in this field. They also bring gender imbalance as most of the people working in this field are males. This shift cases rise in prostitution as men away from home tend to yearn for female companionship, and in some cases homosexuality become accepted as with the case of San Francisco. There is also the rise of crime as the boom status attracts people from distant location, who upon arrival tend to act as if relieved from all social norms that had bound then in their original hometowns. Also the boom status tends to conceal in its burgeoning environment a lot of those who intend to remain hidden among the crowds. There is also the pressure that those newcomers exert on the service structures in the city due the sharp increase in demand which normally leaves supply lagging behind. This, in case of Police services for example, stretches out the capacity of services providers and leaves loopholes through which offenders can escape and cause harm to the society. While in other areas of the service sectors it unleashes the powers of the market due to the availability of non-local cash versus the limited provision of local services which leads to inflating prices.

2.2.1. Increased Mobility

Most of the locations that were affected by the Boomtown Syndrome were not fully urbanised or rural. According to Burfoot-Rochford and Schafft's study on two Pennsylvania counties that witnessed influx of investment due to the development in the shale natural gas drilling (2017), rural communities are viewed as relatively stable with less mobility going on through them. For a population of a rural settlement the perception of stability versus mobility is currently under testing with encroaching globalization. And this is manifested through the introduction of the petroleum and natural gas prospecting that brings the global demand for energy sources to the doorstep of backwater rural communities to make for the needed supply. The result of these tests result in different responses for such communities according to the varying perception of what they see as a stable quality and what they see as lacking and hence look forward to being mobilised towards achieving this goal. Eventually these varying

perceptions result in geographically uneven development. The transformation of such rural communities into boomtowns further complicates the situation for those communities. This is what happened in rural Pennsylvania counties of Bradford and with the exploration of the Marcellus Shale natural gas. The development of this shale gas was enabled by the advent of the horizontal drilling technology and hydraulic fracturing – commonly known as fracking. This made the shale deposits more feasible and enticed investors to develop them.

The inflow of investments was materialised through the flow of people, trucks, and equipment necessary for fracking. These inflows were viewed by many residents who were sampled during the study as disruptive to their daily life. This disruption was manifested with the industrial change that took hold of the two counties, especially with Bradford County which had little history of industrialisation. This change was also manifested with the constant degradation of roads due to the operation of heavy lorries and transportation in general. Road quality was upgraded to cope with the requirement of such intensive operation but it was a symbol for the residents of the counties that their old simpler ways were not enough anymore. Also the introduction of the extraction activities competed with the ways local people dealt with open space. Some residents referred to the fact that previously they could spend some leisure time in an open spot that was publicly or privately owned but such location were getting more harder to find as the natural gas industry people would be grabbing all the available land for their activities. Also the environmental issues were of great concern these counties were located near coal mining locations whose operations in the 1950's polluted local water sources like springs that according to a resident in Greene County would turn orange.

An important issue was the promise of economic booming and job creation. To the discontent of the local population most jobs were occupied with people from outside the counties – if not from other states. The explanation of the investors would be that the local population lacked the necessary skills required for the jobs. However, this issue was less felt in Greene County and more so in Bradford County, due to Greene County's history with the coal mining industry and the presence of technical expertise among its residents. And pertaining to this particular point, these new jobs lured members of younger generations of coal miner families to switch to the shale gas industry which affected the continuity of the extended family tradition of which Greene County coal miners were known for.

The local communities also had to cater for the needs of the incoming workers in order to tap into the benefits of the developing industry. One example would be the change of menus of local restaurants in order to accommodate for the taste of workers coming from other parts of the United States (Burfoot-Rochford and Schafft 2017). Also socially the bond between the transient workers and local population was not permanent as those workers moved on to follow the gas trail. This moving trailing following in the footsteps of gas development mobilised some members of the local population who were able to either get jobs in the gas industry or make enough money

to follow the trail on their own in order to make more money wherever the gas people would settle. The stable populations of Bradford and Greene Counties were now more in contact with distant people and events relevant to the gas development and less stable as a lot of mobilization had taken place (Burfoot-Rochford and Schafft 2017). In other words, hypermobility has kicked in and the idyllic pace of a rural life will never be the same again.

2.2.2. Pressure on Local Services and Inflated Prices

The standard of service provision in rural communities is not the same as in urban communities. The reason behind this difference can be attributed to many factors among which are the distribution and density of population, the nature of economic activities which dictate certain demands in education and other social services, and the nature of the residents which is perceived as laidback and relaxed which allow for more time in service provision. Also the perception that a rural environment is not an intense site of production like cities may justify the delay and the extra time needed to acquire some of the basic services.

In the work on the new boomtowns in the State of North Dakota, Weber et al. (2014) mention that the state witnessed a period of economic growth brought about by an investment boom in oil exploration due to high oil prices and development of hydraulic fracturing after the discovery of new petroleum reserves in the state. This reversed economic stagnation and depopulation. However, among the negative impacts of the boom was the arrival of 'economic refugees' and the distress that fell upon the social services in that rural community. With the sudden increase of population came the increase of crime and rising prices. Also the rural communities of the state were suddenly subjected to an economic environment that has global tributaries, and the paradox between the slow-paced rural life and the fast-paced global lifestyles became very evident. When it comes to service provision to support the burgeoning community of a petroleum city, the process was governed by both hope in the future and reluctance due to past experiences from previous boom-bust cycles that follow the occasional flares in oil prices. With each boom phase the communities tend to spend more on infrastructure in order to harness the potential of inflowing investments for a more or less permanent benefit of the community. But when this phase eclipses and the bust phase is ushered in, the public expenditure in those infrastructure projects does not create immediate revenue and a phase of slow growth coupled with inflation due to the decrease in demand for goods and services when the boom was on.

Housing is an example for this cycle and how the service is impacted for both the local residents and the inflowing labour force. For starters, the community is faced with a sharply increased demand for housing with a limited housing stock at hand. This leads to both demand groups that they are settling for lesser quality or higher prices. After a while the community starts to adjust by providing more housing – increase in supply – and outmigration of those who cannot afford the new situation –

decrease in demand. However, when the bust phase is on, the community is faced with a situation with investments bound in permanent structure that nobody is asking for, the demand group that asked for it is not there anymore, the original population are also either not there or incapacitated by inflation .

Weber et al. argue that in order to counteract the effects of the boom on the community and the services needed a set of tools and policies have to be applied. Among those tools are rent controls, local permanent and temporary taxation, and the encouragement of public-private partnerships in the fields of social services. The last tool is aimed at stimulating the flow of private revenues into the communities which pay a higher toll than outside investors. Through networking between local regulators and incoming investors, a situation can be created where the boom does not actually bust but rather more peacefully deflated (Weber et al. 2014).

2.2.3. Gender Imbalance, Demographic Disturbances and Crime

The boomtown effects are diluted by the sheer size of the population in such well-established urban centers with considerable service infrastructure, as the migrant workforce that come to these towns with the extraction projects are easily absorbed. However, those effects can spill over the decisions of individuals along lines of class, race, or gender. Being a rapidly changing environment, these differences can play an integral role for each individual's capacity in coping with the ensuing changes.

Based on their work on the city of Darwin in Northern Australia, Taylor and Winter (2013) stated that among the most significant adverse effects of the boom phase in the life of a boomtown is the imbalance that occurred in the male/female ratio among the local population. It is associated with the construction and operation of such large scale projects which is characterised by the injection of a large number of male workers. Cities with larger population sizes may be shielded from this effect, but the situation is different in smaller cities and towns.

The cycle starts with the influx of a significant number of fly-in/fly-out workers with technical backgrounds and pay higher than the average workers in the locality of the project. They are not residents and tend not to invest in permanent presence in the city or town where they temporarily stay. They create high demand for available goods and services like real estate – especially rent – as mostly, they do not intend to reside permanently and hence do not invest their earnings in buying property. They also create demand for some services which are not present locally and hence are then served only for them. As with large male populations, demand for female companionship can rise, and services like prostitution, night clubs and escort services may disturb a more or less provincial lifestyle. With the end of the construction phase and withdrawal of the majority of the workforce, high rents are abandoned and real estate loses value. Also the services providers who depended on those outsiders for their income are suddenly out of the market with the service they are providing not suitable for the local community (Taylor & Winter 2013).

The nature of the petroleum industry offers what can be identified as 'masculine' jobs. This leads to the fact that most of the jobseekers flocking to the boomtowns are males. In locations with lower number of population this can tip the male/female ratio of the population towards the masculine side. However this effect is diluted in locations with higher number of people. In Fort McMurray in the State of Alberta, Canada, as of 2006, O'Connor (2015) found that the city had females as 46% of the population, compared to Alberta's 50% and Canada's 51%. This change however attracted women who were affirmative about their feminist identities and intended to challenge the stereotypes of working in contention with a masculine environment. It posed a challenge for affirmative feminists which they were interested to take up. Economically, boomtowns can be rather challenging for newcomers and long-times residents alike as there is plenty of demand for a limited supply of commodities and services. However, it can also be an inspiring environment as it provides a variety of jobs that require little or no skills especially in the construction phase and the build-up to the boom status. This can affect the decisions of young people especially in times when they are required to look for a job or make future commitments. It is also important to acknowledge the economic – or class – background of the individual at the point of making the decision. For longtime residents or those with well-off economic background would be challenged by the rapidly changing environment to maintain their current status. However, for young people who belong to that class, it will be much easier to find support from their families in order to cope with these changes. For example, families with higher incomes or savings can support their children in getting education that will help them get a job relevant to the boom.

In the case of petroleum companies working in Fort McMurray (O'Connor 2015), some had special recruitment programmes especially directed at Aboriginal people. This helped young individuals belonging to this group get access to better jobs and trainings. Also, for student, the government of Alberta provided special funding for Aboriginal students. This financial support gives them the opportunity to focus on their studies, and hence get the most out of their education. Despite the fact that those aforementioned recruitment programmes were restricted to certain groups of jobs, the still offered a more or less preferential access to those jobs and also better quality of education (O'Connor 2015).

It is the social composition of the introduced population that matters. Boomtowns – as places or destinations with high rate of population *influx* - offer safe havens for people who will most likely try to conceal their social backgrounds - like people with criminal backgrounds, runaway adolescents and young adults seeking refuge from family control, and other *escapees.* Also by nature of their new arrival, workers in projects driving the boom will be less acquiesced to follow the social norms of their new place of residence and hence less likely to be controlled by such norms. On the other hand, original residents of those towns may feel threatened by the mostly sudden change in their environment on social and economic levels (Ruddell 2017).

2.2.4. Changes in Space, Densification, Gentrification, and Ghettoisation

Loss of open spaces within and on the fringes of cities is an inescapable consequence of growth. In a Boomtown scenario the rate and nature of open space loss is starker. In her work on the city of Perth in Western Australia, Valerià Paül (2016) noted that in addition to encroachment on the periurban space outside city limits, cities also tend to get denser through the obliteration of open spaces. As for the periurban spaces, they are subdivided into two categories, farmlands and bushlands – the Australian term for forests or shrub-covered areas. Bushlands are protected as parklands, while farmlands are not as safe from urban sprawl. This difference was deepened by the rise of environmentalism which favoured the protection of forests over farmlands, and hence farmlands are designated for urban change when the time comes.

Despite the absolutely important need for creating proper venues for urban expansion, metabolising periurban farmlands into the city should consider other dimensions of city life other than the physical space itself. For example, the presence of these farmlands encourages the existence of shorter circuits for the production and distribution of foodstuff in cities; hence creates a window for short distance transport services and reduces the overall cost of transport on farm products. With the elimination of near farmlands, the cost of such farm products will rise and the window for short distance transport services needed to move those products to the city markets will be narrowed. Long distance transport of everyday consumable products have more adverse effects on the environment that will be compounded by the elimination of the farmland, in what can be described as a circuit with a negative impact on the environment (Paül 2016).

Space is also affected in a different manner. In their study of the recent boost to the extractive industry in Mozambique, which was manifested in the accelerated urban development in Tete City, at the center of Tete province which has huge proven reserves of coal, Kirshner and Power (2015) found out that the flow of investments to the boomtowns could affect their urban fabrics through the creation of enclaves which house segments of the population directly benefiting from the access to the global mining industry, and marginalised periphery housing those who have been dislocated from their way of life due to competition on services and rising costs of living. This came in contradiction to the Mozambican Government's plan to keep inequality at bay during the time it took to restructure the national economy through industrialisation. The ruling party in Mozambique is clearly aiming at eliminating the country's dependence on foreign aid through the exploitation of the nation's coal wealth. But in their effort to make this aim, the government played into the hands of big businesses driving the flow of foreign direct investment. It gave little or no say to ordinary citizens, despite being most directly affected through the degradation of road and transportation infrastructure, or the dedication of a growing sector of state revenues to fund the expansion and upgrading of the infrastructure relevant to the extractive industry instead of uplifting social service sectors deeply needed by the local population. The biased expenditure of the Mozambican government made the core

areas of the city less affordable for the original residents and pushing them aside into the marginalised periphery: In other words: the government induced the gentrification of the core areas of the city.

Against the backdrop of coalescence of the – previously – socialist and anti-imperialist ruling party with the contemporary manifestation of imperialism, the spatial segregation of the local population of Tete into enclaves with full amenities and marginalised peripheries plays on. And unless the current regime changes its direction from serving the exporter to serving their constituents, the dispossession of the local population will continue (Kirshner and Power 2015). This also refers to the importance of governing structure of both the industry and the urbanisation process, where a free and democratic atmosphere can create a more just environment for the fair distribution of the burdens and fruits of development.

2.3. Boom-Bust Cycle

The utilisation of finite resources like petroleum is destined to end with the depletion of the resource. This means that the entire structure which was built to accommodate the extraction process will be rendered useless and obsolete once this end is ushered in. Though this may not apply to the tools and equipment used for the technicalities of the extraction process itself, as with the advances of technology the percentage of reusable equipment has raised vis-à-vis the consumable or none-reusable ones.

This is also manifested not only in the physical structures of the boomtowns but also in the social habits and culture of the inhabitants. While one of the paramount obstacles to urban life in boomtowns is the provision of housing, the construction of new permanent houses proves both costly and time-consuming. Also, when the bust phase commences, those – now empty houses – find no one to rent them out and sit empty for long time waiting for either falling into decay or new users. Also the provision of infrastructure is caught in a paradox; whereas the rise in the demand for utilities due to the influx of new residents and migrant labour necessitates investment in new infrastructure networks to accommodate the rising demand, the city management tends to be fearful of the induction of the bust phase which will render their investment in infrastructure – which normally have their return on investment over prolonged periods of time – a gamble (Weber et al. 2014). This gamble is eventually translated into ghost towns. In the wake of the California Gold Rush in the mid-19th century, many of the locations were abandoned once the gold reserves were depleted and some of them still stand to this day as *ghost towns*.

Before the transformation of those locations into ghost towns, they first suffer from declining population for two reasons; the first one is that some of the original residents – who were able to find jobs within the petroleum sector for example – move out from the cities to follow the petroleum – or gas and other resources – trail (Burfoot-Rochford and Schafft 2017). The second reason is that for those who manage to provide for the needs of the migrant workforce, whether through the

provision of housing or custom services, the departure of their new client base means that they will go out of business. And if they do so, they would leave their original location looking for means to earn their living elsewhere.

A growing trend among petroleum companies now is to shift their housing and services provision in general – in collaboration with the local government of the boomtowns – towards labour camps (Weber et al. 2014). In those facilities the labour force are housed in temporary housing provisions where the support services are centrally managed by the petroleum company which allows for the segregation of the labour force from the rest of the local community and decrease the cost of providing such services (Taylor and Winter 2013). This trend may save some of the costs for the investors and developers of the petroleum and other extractive industries. On the other hand it will have negative social impacts on the workers themselves as they will bear the social cost of leaving their homes to an environment to which they cannot bring their families. And eventually the petroleum companies will not be able to confine the labour force to, and keep within, those camps for prolonged periods of time, especially if they live within the vicinity of active urban centers. And while this strategy may prevent the development of boomtowns – and eventually ghost towns, it will prevent the flow of investment in the infrastructure and other services within those towns.

2.4. Conclusion

The Boomtown is an integral part of the extractive industries environment. It symbolises the capitalist drive to extract every possible resource with minimal investment without repaying the social costs that would befall on the local communities nearby to the extraction sites. It also symbolises the drawbacks of depending on a finite resource as a base of economic development for a city. Such cities or towns may enjoy a limited period of exponential growth. But with very few exceptions this growth comes to a halt and the physical and social structures that were developed in its midst are left in tatters (Burfoot-Rochford and Schafft 2017). Also for the energy resource extraction sector, the global context in which it is being operated means that unless the governance structure enjoys high integrity, the affected population may not be served properly (Kirshner and Power 2015).

3. Subjects and Methodology

3.1. Methodology

The primary goal of this work is to pave the way for a better understanding of the *Boomtown Phenomenon*, and the social and economic changes that it brings with it in order to be better able to mitigate the negative impacts and capitalise on the positive ones. It is also important to provide such understanding and make it an integral part of the planning process for the utilisation of natural resources in the underdeveloped areas of Egypt. In order to address this goal, a comprehensive approach was utilised in order to create a consolidated academic evidence-based foundation for the research framework and an integrated picture of the application of this framework on the ground. The following is a brief on the study design, research questions and data collection.

The argument will be based on the study of the socio-economic dimensions of the Boomtown phenomenon and its relation with exploitation of natural resources. This study will be projected on three cases which will categorise Boomtowns into three different stages of the Boomtown spectrum; nascent, mature and stunted growth. This conceptual frame of stages will help shed light on how to deal with the case of the city of Ras Gharib which, according to this work, falls under the stunted growth category. This study will reflect and attempt to qualify the socio-economic and institutional factors that have led to the development of all the three cases.

3.2. Research Questions

The main questions around which this study revolves are:

- What is a Boomtown?

- What makes up the Boomtown Syndrome? What are the symptoms of it?

- Why do Boomtowns behave differently among themselves?

- What are the impacts of the core economic activity on the urbanisation?

- What are the roles of the planning policy and governance structures of both economic and urban development in predisposing the Boomtown Syndrome?

- Can the Boom-Bust cycle be broken?

- Is there a cure for the Boomtown Syndrome?

3.3. Aim of the Research

The foremost aim of this research is to determine whether the Boomtown Syndrome is curable or not through the extraction of lessons learnt at both the nascent and mature of its stages.

3.4. Hypotheses

- A deeper, historically informed understanding of the Boomtown Phenomenon will allow better planning for the development of resource-based local economies. The planning method should include social dimensions in order to mitigate the negative repercussions of the boom and bust phases.

- The dependence on finite natural resources as bases for urbanisation can be complemented and thus alleviated through a diversified economic base.

3.5. Research Work Plan

Key Concepts

This research starts with attempting to define the concept of Boomtown. For that purpose, it uses the body of existing scientific research that has dealt with the phenomenon and studied the previous occurrences in some parts of the world, namely America and Australia. It then moves to frame all the attributes of the Boomtown under the umbrella of the Boomtown Syndrome. This term is used to describe the socio-economic nexus that grabs a location which attributes its acute development to the discovery of an economic resource in its vicinity. Similarly, the Boom-Bust cycle describes the mechanism in which these effects are manifested. In this work, the focus will be on petroleum; however, lessons will be drawn also from other developments based on natural gas and coal. Central to this work is the social dimensions as they represent the parts that affect the people most: impacts on community services, imbalances in gender ratios, social mobility, and alteration of the social environment with the introduction of capital and labour from backgrounds with different cultures. The governance structure of development was studied, too, as it had its importance in the development and management of the Boom-Bust cycle and in the positive cases help to mitigate the negative impacts of it, while in the negative cases aggravated them.

Case Evidence

3 case studies were selected in order to determine the prognosis of the Boomtown phenomenon based on the stages of petroleum-derived development was at. The city of Houston, USA, was used as an example of a mature boomtown that had capitalised on the oil boom they had from as early as the turn of the twentieth century in order to create a diversified economic base that would help create jobs and retain the population. The second case study was the city of Sekondi-Takoradi, Ghana. It helped as an example of a nascent development in the field of petroleum and an opportunity to see the inception of the boomtown. The third and main case study is Ras Gharib, Egypt, which fell into stagnation and failed to retain significant population despite its lucrative petroleum sector.

Areas of Analysis

The Boomtown effects on the lives of residents were studied in the following areas:

- The housing condition.
- Gender Balance/Imbalance.
- Quality of services provided for the residents.
- Outmigration of original residents as opposed to the influx of migrant labour.
- Prospects for personal development for residents

Fieldwork Results

4 field trips were executed to the city of Ras Gharib in order to obtain a clearer picture for the living conditions of the local residents in 2016. During these field trips local residents were interviewed after being notified that it was done as part of a scientific study. The interviews were qualitative, open interviews and proceeded casually. The interviewees were a mix of government officials, functionaries and passers-by in the streets of the city. A meeting was held with the city mayor in his office where he set out on a monologue describing the central government plans for the city as opposed to the current situation. 3 interviews were conducted with local government engineers, 1 in the Zoning Department and 2 in the Water Department, revolving around living conditions and service provision in the city. A number of other interviews were conducted with shopkeepers, 1 with the local priest, 1 with a teacher at a local school, 1 with a local contractor. The third site visit was interrupted by the Police Investigation Service and the field party was summoned to the local police station before being ordered to the National Security Department in Hurghada. The final trip was conducted in the aftermath of the October 2016 flash flooding event.

4. Case Studies

4.1. Houston

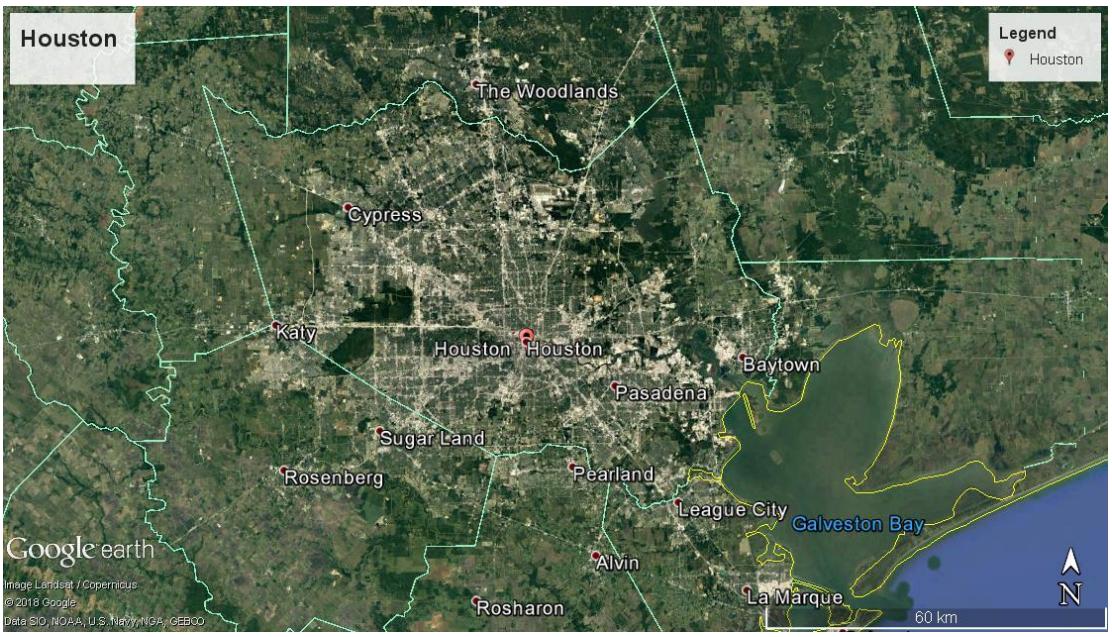

Figure 1 Satellite Image of Houston (Source: Google Earth)

4.1.1. Introduction

The city of Houston lies in the eastern region of the State of Texas on the banks of Buffalo Bayou. It is the most populous city in Texas and 4th most populous city in the United States. It lies at the heart of the petroleum industry in the United States and the world since the discovery of petroleum in the nearby Spindletop salt dome, which is considered by some as the discovery that changed the face of the industry.

Houston was established in 1836 by two real estate developers from New York – Augustus Chapman Allen and John Kirby Allen - and was incorporated into a city in 1837. It was named after Sam Houston, the president of the – then independent – Republic of Texas. The contention pertaining to the seat of government of the Repulic of Texas, and the State of Texas after the annexation to the United States in 1845 remained all the way till 1872 when finally the seat of local government in Texas was settled in Austin by popular vote.

Figure 2 Map of the Allen Brothers' Development of Houston on the western bank of Buffalo Bayou (Source: University of Houston Digital Library)

In their original bid to attract investors to the site, the Allen Brothers publicised the site as the new hub of Texas and a port with navigable waters where ships would come from the ports of New York and New Orleans through the Buffalo Bayou. First arrivals to the site through the bayou found the waterway clogged and the weather rather humid, contrary to the exaggerated publicity of the Allen Brothers. In January 1837, the city had only 12 residents and in four months the population expanded into 1,500 (McComb 2017).

Houston capitalised on its location on Buffalo Bayou and on the crossroads between various destinations to thrive. And thus investments in communications and transport were essential to the growth of Houston and trade in the eastern parts of Texas. Railways were established between Houston and the hinterland of Texas on one side, to the port of Galveston and Beaumont on the other, eventually linking up with the national railways network in 1873. Also major investments were dedicated to enhancing the navigability of Buffalo Bayou and the establishment of the Houston Ship Channel which was inaugurated in 1914. The destruction of the port of Galveston in 1900 led to the rise of the importance of the Houston maritime transport infrastructure. Now Houston is an international shipping hub for both inbound and outbound trips.

Figure 3 Plan of Houston in 1873 by Augustus Koch (Source: Wikicommons)

The presence of developed transport infrastructure and abundance of natural resources in the vicinity of the area led to the inflow of investments to the region. Also the natural endowment of a vast groundwater aquifer contributed to the city's growth (Kotkin 2007). And by the time of petroleum discovery in Spindletop Hill in 1901 in nearby Beaumont, Houston was already an established economic hub in the American South rivaling those in the American Eastern and Western Seaboards.

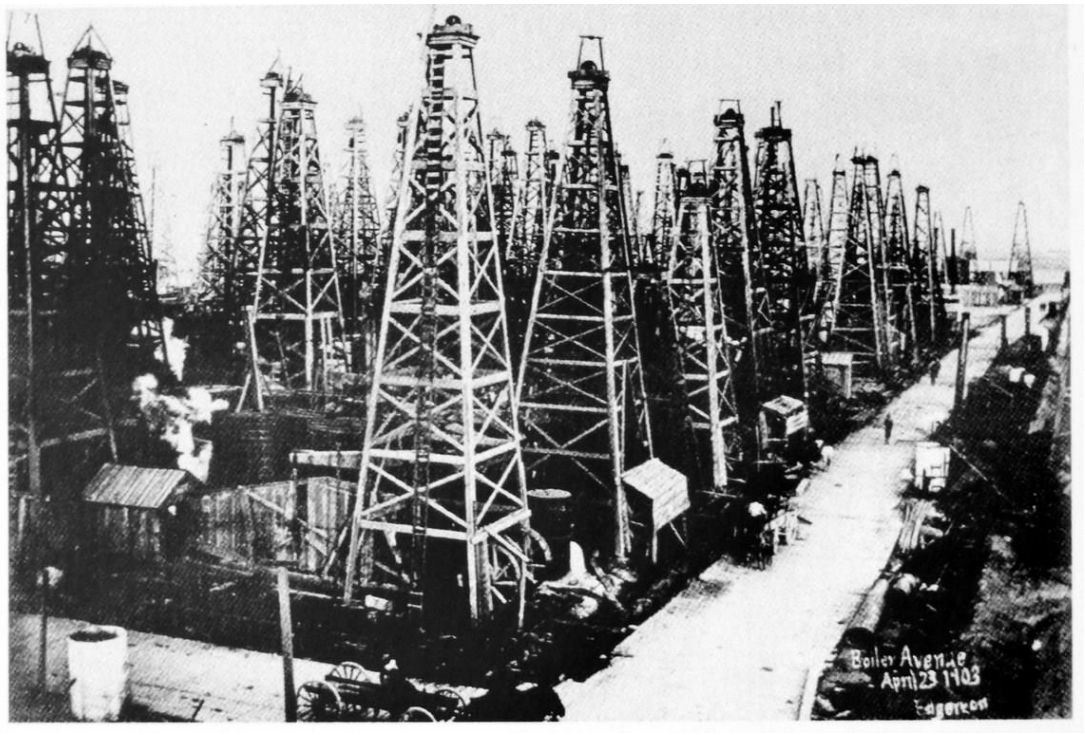

Figure 4 Spindletop, Texas 1903 (Source: Kjell Aleklett)

4.1.2. Houston *the* Boomtown

The discovery at Spindletop Hill changed the face of the region, the state, and the entire world. It was the first time on record for prospectors to come across such a gigantic find: 100,000 barrels of petroleum shooting up for 50 meters in the sky for 9 days before it was finally brought under control (GEO ExPro 2008). However, it did not come to fill a void. The surge in investment in Houston found an established base for its settlement and growth. Around the turn of the 20th century, the population of Houston was 44,633 (US Census Bureau) living in a city with established economic activities attracting and retaining population. This strong base acted as an incubator for the newcomers; almost all amenities and services required by the new industry were present. The petroleum industry picked up pace as of the 1920's with the development of drilling and refining technologies. By the time of World War II, Houston became a very important center for manufacturing important war-related commodities like fuel, petrochemicals, and armaments. Also along the Houston Ship Channel, shipbuilding works started to set up business which added to the importance of Houston as a port city.

The average population increase in Houston per decade until the 1960's was 60% (Feagin 1985). This was translated into Houston surpassing Philadelphia as the 4th most populous American city in 1983. As of January 2017, the population of Houston is estimated to be 2,319,603 (City of Houston Planning Dept. 2017). At the core of this economic development which enabled the retention of population was the petroleum industries sector. And as of 1985, almost 150 years after the city's foundation, 34 of the major American petroleum companies had headquarters in the

city including administrative, operative, productive, and support functions. This also attracted and retained other businesses servicing the petroleum sector companies like law firms, banks, and other administrative and consultancy firms (Feagin 1985).

4.1.2.1. Mobility

In the words of the original promoters of Houston, the Allen Brothers, one could sail in ships from Louisiana and other ports in the United States up the Buffalo Bayou and right to the doorstep of the city (McComb 2017). From the very first moment the developers of Houston acknowledged the importance of mobility and transportation to the development of their city. This knowledge was shared by both the city government, the state of Texas and individual developers alike. Central to the development of Houston to its current status was the development of a functional railways system that would connect the city to the surrounding area and beyond. The navigability of Buffalo Bayou was enhanced over the course of the 19th century and after then the Houston Ship Channel became a national project in which the federal government participated (McComb 2017). The development of the maritime transport infrastructure enabled the rise of the shipbuilding industry along the Houston Ship Channel. The residents and government of Houston also had to deal with building roads in their marshy region. Roads had to be carefully and continuously maintained especially during the rainy seasons.

Houston had its first airport in 1928, an international airport inaugurated in 1954, then another one in 1969. The city also bought a former Air Force base and turned it into a civil airport in 1984 (McComb 2017). Houston has maintained its position as a transportation hub on regional, national and international scale. It is also befitting of Houston to be selected by NASA to be the site of Manned Spacecraft Center in 1961, which was renamed into Johnson Space Center in 1973 (NASA 2016). And hence, Houston had earned its place on the gateway to the sky as well.

Also the city of Houston tackled mobility of their products; a network of pipelines deliver petroleum products from ports and wells to refineries and from refineries to the markets in various areas of the United States and even abroad.

The concepts of mobility and transport were so essential to the growth of Houston, and this fact was embraced by the different city administrations. This was translated into both capital and labour-intensive projects that made way for a lot of job opportunities for the blue collars.

On the other hands, the emphasis on transport and its importance to growth had its negative manifestations. Around the time of Houston becoming the 4th most populous city in the United States in 1983, the city was the most dangerous to drive in with a fatality rate for traffic-related reasons reaching 23 in 100,000. Traffic-related pollution is also high. Rush hours extended for more than 4 hours in the morning and 4 in the evening. The Texan gun culture might have contributed to the flare fatalities as many Houstonians and Texans in general carried weapons in their vehicles (Feagin

1985). As of 2001, more work was done to alleviate the traffic problems through the incorporation of traffic control technology, incident management and better design and execution for intersections and other traffic components (Texas Transportation Institute and the Texas A&M University System).

Houston exemplifies the importance of mobility and efficient transport systems to the growth of cities, and how an efficient transport network inside the city and linking it to its surroundings is essential for a city to develop the resources around it. However, Houston faces serious problems with regards to planning, construction and maintenance of mobility. Firstly, for decades Houston had no transport authority until the establishment of the Metropolitan Transit Authority in the 1980's in order to seek the alleviation of the increasing traffic jams in the city. Also, transport development favoured individual motorised traffic over other means – namely public transport. The nature of the soil on which Houston is located causes a challenge to road construction and maintenance as it is mostly clay which high groundwater tables and abundance of surface water. This causes frequent mudslides and the asphalt on the road surface to crack. Houston roads are described to have the worst potholes in the nation (Feagin 1985). In 2016 the city of Houston launched a website to enable residents to report and follow up on the maintenance of potholes with the mayor promising the residents to fix reported potholes in 24 hours (Houston Public Media 2016).

4.1.2.2. The Service Sector

In their effort to attract people to the city, the Allen Brothers told their clients in the advertisement that there would be abundant services that would make life in Houston very convenient (McComb 2017). There was also the abundance of potable water in the underground aquifer underneath the city. This assured the newcomers to the town that their main needs like drinking water can be met. People dug artisan wells extensively that land began to subside until the city administration stepped in and took control of the water distribution. The occasional flooding of the Buffalo Bayou was also a cause for concern and led to the establishment of a local flood control agency in 1937 (McComb 2017). However, the soaking soil and the high humidity for the soil made it a breeding ground for mosquitos and other pests which caused several outbreaks of Yellow Fever that decimated the population for many times in the middle of the 19th century. This was made even worse by the fact that nearby Galveston and Houston itself were ports-of-call or final destinations for many ships coming from Latin America and the Caribbean. Finally quarantine was established in Houston on the occasion of the Yellow Fever outbreak in Galveston in 1870 (Ackerman 2016).

Since then, general hygiene and public health were taken into consideration by city administration as they saw epidemics destroy the population of nearby Galveston. It was even more important to plan for proper healthcare facilities with the influx of population from far and wide coming into the city seeking economic prosperity. As of 1925, the first entity around which the Texas Medical Center started to operate: the

Hermann Hospital. Over the course of more than 9 decades, this cluster started to grow with more private and university hospital joining until it was proclaimed the largest healthcare facility in the world (TMC 2016).

Housing in Houston had to cope with the growing demand by way of increase in population of 60% each decade. Private developers were the main promoters of housing expansion of the city. In turn, the city administration responded by annexing more lands to accommodate the expansion until their hands were tied by state legislature. It was always – almost – good to invest in housing in Houston for those who had the money, but for those who did not have it, they would have to apply for public housing through the Houston Housing Authority (HHA). HHA was established in 1938 as a response to federal legislation on housing. It is mandated to provide decent housing for low income families, currently numbered at 60,000 Houstonians (HHA 2017). The agency subsidises both developers and low income families seeking housing units. The subsidy goes to the developers through the Low Income Housing Tax Credit Programme (LIHTC) – a federal programme for finding of low income housing. Through LIHTC developers applying for this tax cut should assign a portion of their development for low income families with the approval of local stakeholders like school boards, neighbourhood groups,…, etc. A new legislation – House Bill 1792 - was proposed by a right-wing politician to expand the range of interest groups that should be mandated to have a say in the development. The problem with that proposed legislation is that it gives power of people living in well-off areas to prevent low income families from residing in their neighbourhoods. Under the current political atmosphere in the United States, the rise of right-wing political figures will help reinstitute old forgone traditions like segregated housing policies and put a cap on funding for subsidies housing (Capps 2017).

Houston also had a variety of cultural and artistic venues that were constructed throughout the years.

Houston city administration participated actively in the regulation and provision of services because it is good for business not out of social responsibility.

4.1.2.3. Demography

Houston was started from scratch by the Allen Brothers in 1836. The site had no population and remained to be viewed as repulsive by some visitors for its humidity and mosquito infestation, and that description persisted even after the discovery of petroleum and the affluence that came through, well into the twentieth century (Kotkin 2007). However, the site soon attracted a growing number of people and as of 2017 the city is home to 2,319,603 residents.

Year	Sources	As of (Date)	Population
1900	U.S. Census Bureau	April 1	44,633
1910	U.S. Census Bureau	April 1	78,800
1920	U.S. Census Bureau	April 1	138,276
1930	U.S. Census Bureau	April 1	292,352
1940	U.S. Census Bureau	April 1	384,514
1950	U.S. Census Bureau	April 1	596,163
1960	U.S. Census Bureau	April 1	938,219
1970	U.S. Census Bureau	April 1	1,233,505
1980	U.S. Census Bureau	April 1	1,595,138
1990	U.S. Census Bureau	April 1	1,631,766
2000	U.S. Census Bureau	April 1	1,953,631
*2010	U.S. Census Bureau	April 1	2,100,263
**2017	City of Houston Planning Dept.	January 1	2,319,603

Source: U.S. Census Bureau 1900 - 2010

*Note: *2010 Population as revised by the U.S. Census Bureau*

** *2017 Popluation Estimated by Planning and Development Dept.* *January 2017*

Table 1 Historical Population Development of the City of Houston 1900: 2017 (Source: City of Houston)

By 2015 the Greater Houston Metropolitan area, comprising of 9 counties, was home to 6,656,947 residents. This city is now home to more than 100 ethnic groups, divided into 4 main divisions with Hispanics ranking 1st with 43 percent Whites 2nd with 26 percent, African Americans 3rd with 23 percent, and Asians 4th with 6 percent (McComb 2017).

In the middle of the 19th century and before the discovery of petroleum, Houston's economy depended on plantation agriculture. And like most of the southern states in America, depended heavily on slave labour. Houston became heavily segregated, with African American communities having their own facilities separately from the Whites. Segregation continued into the 1960's (McComb 2017). Mexicans and Latin Americans also were present in Houston and Texas in general since the very beginning, after all, Texas was part of Mexico before being an independent republic. Also being a port increased the window through which the community of Houston could deal with foreigners.

With the discovery of petroleum, the city started to attract more people from various backgrounds. And as with the cases of other boomtowns, the influx with newcomers, the lower strata of the community were pushed to the periphery. This helped accentuate the class and racial differences in Houston, and African Americans – and other people of colour - were more affected with the negative impacts of the petroleum industry than others (Fleischman and Franklin 2017). This comes in many ways: these segments of the community were manipulated into accepting lower paying jobs in the petroleum sector that would normally expose them to greater health

risks, and in the same time the petroleum industry facilities with all the pollution they emit would be located closer to the neighbourhoods where they live.

Houston exhibits no significant prominence of male population over their female counterparts; with ratios of both almost equal (US Census Bureau 2017). This can be attributed to the already large number of the population which can absorb the influx of male workers.

4.1.2.4. Spatial Dimensions

Houston was established by the Allen Brothers of New York around 1836 on half a league of land on the western bank of Buffalo Bayou that they bought for 5,000 dollars. In their bid to attract settlers, the Allen Brothers promised to build government buildings and a Texas Capitol. These promises were not entirely delivered. Similar efforts were done in Texas during a land speculation surge which was endorsed by the Government of the Republic of Texasin order to catalyse investors to develop land and settle and retain population. At that time Houston was publicised as an inland commercial hub that was also accessible through Buffalo Bayou. Early visitors' accounts of the city stated that most of Allen Brother's propaganda was nonexistent. One of the primary selling points promoted by the Allen Brothers was accessibility of Houston by ships through Buffalo Bayou. Initially, the bayou proved very difficult to navigate, and its navigability was subject to flooding and other factors related to tides from the Gulf of Mexico. This point was finally dealt with when the Houston Ship Channel was opened for navigation in 1914. Another factor was the humid weather and frequent rains that – combined with the high groundwater table – made the soil soggy and turned the roads into muddy stretches where one could go half a foot deep. The city had very few residents compared to the potentials it held as claimed by the Allen Brothers, to the extent that the passengers onboard the first ship finally making it to the city through the bayou could not realise that the few log cabins and shacks were actually what was publicised as the *emporium of Texas*.

Developments were attributed to private initiative rather than to city government. Many of the suburbs surrounding Houston owe their existence to private developers starting in the late 19th century and early 20th century. Among these suburbs are Pasadena, Houston Heights, Deer Park, and West University Place. With the affluence provided by the petroleum industry, a new class of urban development was coming into place. More attention was given to expressions of wealth and amenities. The River Oaks suburb was developed by the Hogg Brothers, especially designed with grand homes and large green lawns that would show such grandeur along its curved streets. It became home to the new business elite thriving in Houston and seeking distinction from ordinary working class. In time, and with more accumulation of wealth, petroleum industry magnates started to invest in real estate. An example of this kind of development was the Woodlands, developed by George T. Mitchell, a petroleum industry businessman. By 1970, the United States Congress approved a

scheme provided by the department of Housing and Urban Development to support private developers in their efforts to establish new communities. 14 Title VII new towns were established before the process was relinquished in 1978. Mitchell used this scheme to develop the Woodlands, which is now a statistically acknowledged locality and part of the Houston-the Woodlands-Sugar Land metropolitan area. Though many of the Woodlands residents commute to work in other parts of Houston, the area is not purely residential as many companies have their headquarters there.

Houston used annexation to accommodate for the growing need of the population for development space – a process in which the local government at Houston would annex unclaimed lands outside its jurisdiction - in Harris County, Houston's local county in Texas. Cities in the United States use annexation for two main purposes: acquisition of land for the purpose of development and increasing the population base liable for taxation through annexing the land on which the target populations live in return for taking over the responsibility of providing them with services or utilities either entirely by the city government or in conjunction with the relevant utility district (Houston 2012). Houston derives its power to annex extraterritorial jurisdiction (ETJ) land from its status as a home rule city. This status gives cities in the United States with a population over 5,000 residents the right to legalise any action that does not contradict with state or federal law (Houston 2012). This contest for annexation in Texas was necessary as the state provides little to no financial assistance to cities. However, in certain cases more than one city would contest on the annexation of a certain area which in 1997 led to the Texas legislature to limit the annexation powers of cities (McComb 2017).

4.1.2.5. Current Trends in Urban Development

The city of Houston expanded exponentially from half a league in the original Allen Brothers development scheme back in 1836 – roughly 9 square kilometers – to more than 1600 square kilometers in 2017 - within the span of 180 years, 18000 percent increase. This means that an area equal to the original development was added every single year.

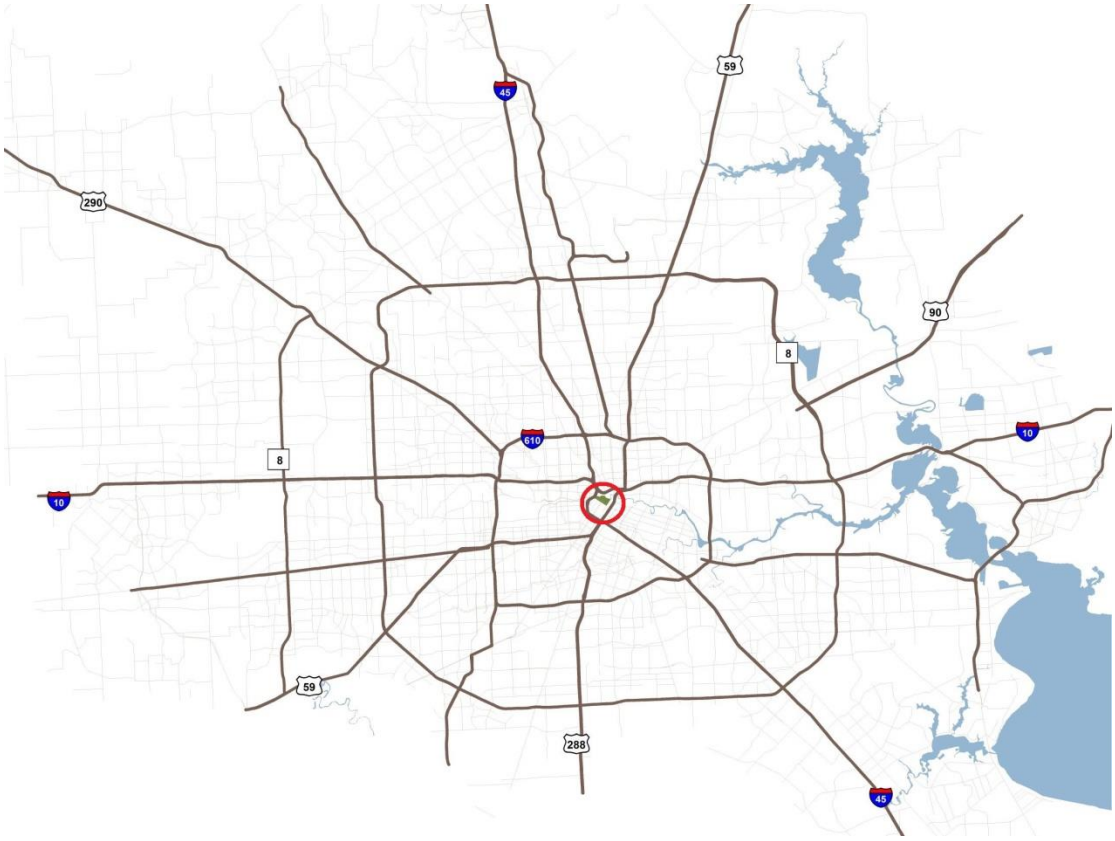

Figure 5 Map of the Original Allen Brothers Development is shown in brown inside the red circle (Source: City of Houston - edited)

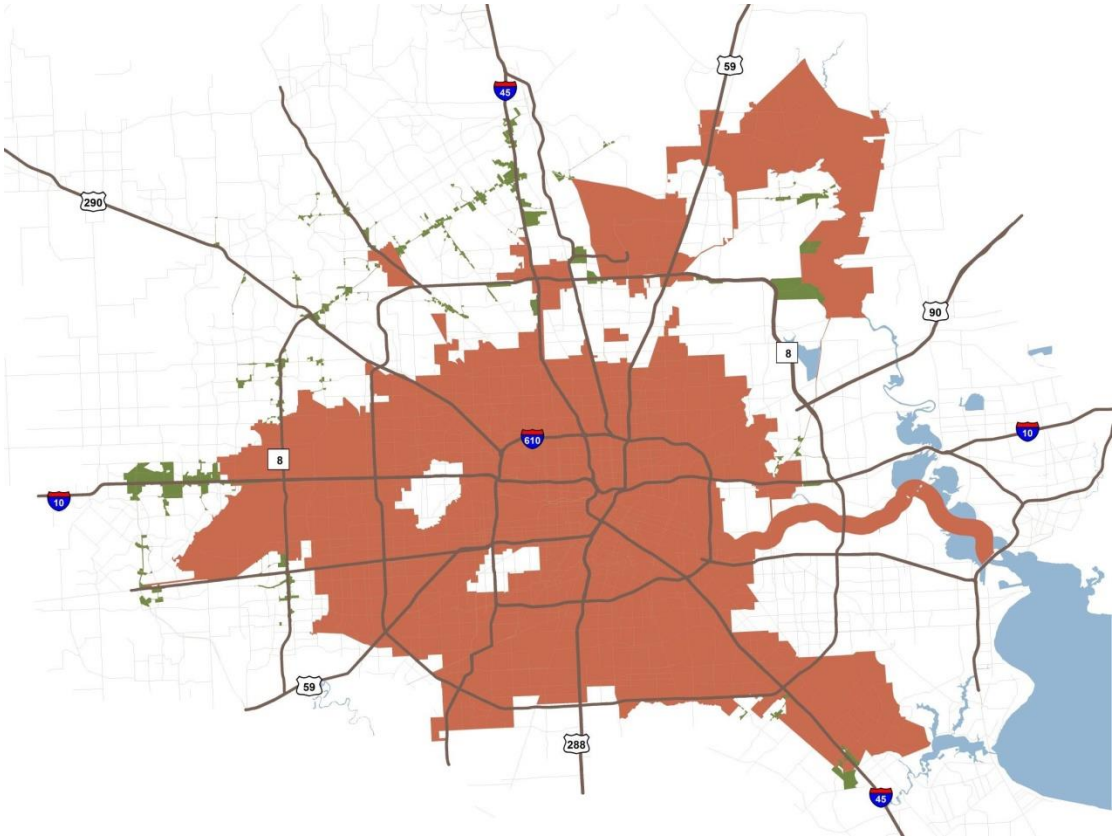

Figure 6 Map of the Current Extent of Houston (Source: City of Houston)

This growth had been mainly administered through annexation. Previously, annexation of land is enacted by city council and in some cases did not have to consider the opinions of residents of land to be annexed. That was until recently allowed within the local government charter of the state of Texas. As of December 1st 2017, the cities of Texas are compelled to take heed of the residents consent. Accordingly, the power of annexation has been withdrawn from Houston as well as from other Texan cities. The passage of this legislation will put Texan cities between a rock and a hard place; where city governments are not getting any financial assistance from the state, and on the other hand, their hands are tied when it comes with expanding city limits to include tax-revenue-generating activities (Houston 2017). The limitation of municipal financial resources will hinder the capacity to maintain or provide new services for its residents and attract and retain businesses and investments. This will in turn decrease Houston's capacity to compete with other petroleum industry centers across United States and the rest of the world which enjoy abundant regional and national government assistance. After the enactment of this Texas legislation, Texan cities will be the only cities in the United States that are deprived of both state or federal assistance on one side, and the power to annex land to generate revenue to finance municipal services.

This adds another constraint on Houston's expansion. Considering the geographical location of the city within a unique environmental system liable to torrential rain and flooding, Houston eventually expanded into flood-prone areas around Buffalo Bayou and freshwater wetland systems around Galveston and Trinity bays.

Urban expansion into wetland systems comes with a very high cost; both to the environment and the local economy (Jacob et. al 2014). The wetland system on the northern shores of the Gulf of Mexico acts as drainage field for the freshwater bayou draining the coastal plains, where the contaminants and other pollutants are diluted before entering the marine environment of the Gulf of Mexico. On the other hand, the wetland system acts as a natural reservoir where storm water drainage during extreme rain events can be held until the tides subside and the drainage takes place back into the sea instead of flooding the coastal plain. Clean Water Act mandated that developments in wetland areas should prove the construction of substitute wetlands in lieu of the area consumed by the development before issuance of permits. However, a recent study states that that rule was not much adhered to during the period of the study (Gonzalez et. al 2017).

In 2017, the city of Houston witnessed the passage of Hurricane Harvey, a grade-4 tropical storm and the strongest in the 2017 Atlantic Hurricane season. It was also the second most severe in terms of destruction in the history of the United States after Hurricane Katrina in 2008, with destruction worth of 125 Billion US Dollars (NOAA 2018). The aftermath of the disaster revealed a lot of problems with the urban development of a large city such as Houston in a flood-prone region of the Texas coastal plains. Some of the developed areas are located in areas designated by the Federal Emergency Management Agency (FEMA) as flood zones. Some

developments depended on outdated flood data, and almost a quarter had no flood insurance (Campoy and Yanofsky 2017). These findings can be attributed the fact that Houston has no proper urban planning regulations. Houston is the largest city in the United States with no zoning regulations. And despite the presence of several federal, state, and municipal regulations, their enforcement was not complete (Gonzalez et. al 2017). And with the current political environment that is geared towards deregulation, rolling back many of Obama era laws, and decreasing of funding for important federal institutions like the Environmental Protection Agency (EPA), it is more likely that the reconstruction of Houston and the other areas affected by Hurricane Harvey in the states of Texas and Louisiana will follow in the footsteps of the existing structures.

4.1.3. Conclusion

Houston's milieu of services to industry and community was described by Kotkin as Opportunity Urbanism (Kotkin 2007). In its bid to capitalise on the natural endowments of the surrounding environment, the city invested heavily in infrastructure in order to attract more businesses. Even before the discovery of petroleum in nearby Beaumont around the turn of the 20th century, the city bolstered its position as a transportation hub between the area of the coastal plain of Texas and the inland areas to the north and west. The completion of the railway links in all direction was of prime importance. The city jumped to the opportunity when Galveston, the primary Texan port on the Gulf of Mexico, was destroyed by a hurricane in 1900, and steps was taken towards the completion of the Houston Ship Channel by federal support, thus helping Houston to replace Galveston as the primary port.

The petroleum industry arrived at a very robust incubator when it established its presence in Houston. Houston had the transportation means needed to ship the extracted petroleum through rail and ships. The home rule status coupled by the abundance of capital from existing investments in cattle, lumber and other agricultural sectors provided the necessary funding for the industry and the needed infrastructure. Also, both Buffalo Bayou and later the Houston Ship Channel served both for the transportation of petroleum and as sites for the construction of refineries along the banks of those two water-bodies (McComb 2017). This however led to notorious pollution of the marine environment after discharging into the Galveston Bay.

Houstonians boasted themselves as the entrepreneurs of the day, and the city exemplified a progressive mode of capitalist urbanisation. The progressive nature of business in Houston is that it was inclusive as long as it benefited business owners and helped the flow of money into the city. Among such examples was the construction of Houston Negro Hospital in 1926. The premises seemed to be presenting quality healthcare to African Americans, but it might as much have been indoctrinating racial segregation in the healthcare sector. Segregation in public remained till the 1960's.

Houston benefited from its status as a home rule city through the enactment of legislation that would enable its growth. A stark example is the utilisation of annexation powers to enlarge its area and include small hamlets and small settlements in the surrounding region for more taxation. The amendments to the annexation rules in Texas in December 2017 will curb this power and leave Houston more inclined towards densification and vertical expansion.

Houston was not very much affected with the tribulations of the boom-bust dynamics of the petroleum industry due the presence of a developed and diversified urban economy. However, some of the ailments of that cycle are still manifested like the social and spatial marginalisation of the lower strata of the community. This is evident through some studies on the reality of people of colour living in quarters of Houston which are most adversely affected by pollution and general public stigma (Fleischman and Franklin 2017).

Finally, the tendency to disregard the rules necessary for maintenance of the environment and mitigation of adverse impacts of development, which is driven by deregulation for the betterment of the business environment, led to the city of Houston bearing the brunt of catastrophic environmental events like Hurricane Harvey in 2017 (Gonzalez et. al 2017). Houstonians' desire in keeping the boom status of their city going brought upon them damages which could have been averted through regulating the boom. This leaves their city liable to other kinds of busts which no amount of diversification of economy will help mitigate.

Figure 7 Flooding in Houston during Hurricane Harvey in 2017 (Source: Paul Dellagatto on Twitter)

4.2. Sekondi-Takoradi

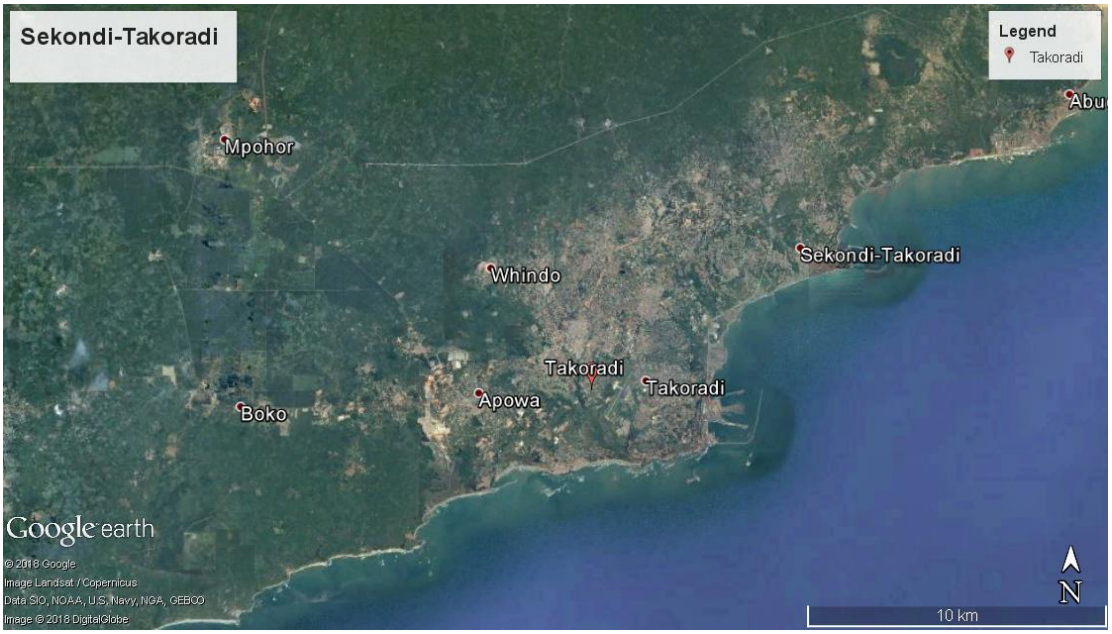

Figure 8 Satellite Image of Sekondi-Takoradi (Source: Google Earth)

4.2.1. Introduction

Sekondi-Takoradi is a metropolitan area and the capital of Ghana's Western Region. It is a coastal sea with borders the Gulf of Guinea. It is the third most populous city in Ghana with a population of 559,548 in 2010. The number was projected to reach 700,034 by 2017 (Ghana Statistical Service 2010, 2014). The city is an established economic hub that received additional prominence since the discovery of petroleum offshore in 2007.

Sekondi-Takoradi Metropolis covers an area of 385 square kilometers. It is the most developed city in the Western Region, which is rich in natural resources like cocoa, coconut, palm oil, as well as important minerals such as gold, and recently petroleum and natural gas (Quayson 2012). The *Twin City* as it is called in Ghana was formed by the municipal union of two settlements Sekondi and Takoradi in 1963. But before that, the area had been inhabited by the Fanti people who migrated from central regions of what is now Ghana during the 17th century and established viable social bonds and governance structures in the region (Britannica 2017).

Sekondi was a notable fishing town until it rose to prominence around 1900 as a commercial hub for the inland area of the western region of Ghana. This was helped by the construction of railways to the interior in order to exploit the natural resources. Eventually the town was upgraded into a city and the local council was established in 1903 (Quayson 2012). On the other hand and around the same time, Takoradi was developed from its primitive status by private enterprise. The area was rented out by a Polish trader from the local chief and a port was built (Obeng-Odoom 2012). Later the railways were relocated to Takoradi which propped its status for economic growth

and attraction of migrants from other locations in Ghana. By 1946, Takoradi was merged under the local administration in Sekondi municipality and by 1963 they were proclaimed one city with the name of Sekondi Takoradi (Quayson 2012).

Both Sekondi and Takoradi, in the run-up for their union, owed their growth to being transportation hubs and outlets for the rich interior. That status was supported through the construction of railways and land transport, as well as maritime transport. Takoradi was West Africa's first artificial port constructed by the colonial administration in 1928 as part of a plan for the exploitation of timber and gold riches in the region (Obeng-Odoom 2012). Government as well as private enterprise and capital flowed to the region and helped establish a diversified economic base. This economic base was maintained under both colonial rule and during and after independence. And with the discovery of petroleum in the Jubilee offshore field, Sekondi-Takoradi's status as a national economic growth pole was accentuated.

Figure 9 Map of Sekondi Takoradi Metropolitan Assembly (Source: Ghana Statistical Service)

4.2.2. Sekondi-Takoradi: Anticipating the Boom

The discovery of petroleum in the offshore Jubilee field southwest of Sekondi-Takoradi was announced by President John Kufor of Ghana himself. Mr. Kufor described that discovery as a boaster to the national economy of Ghana that needed to be well administered in order to realise its full potential (Nguyen 2015). The local economy in Sekondi-Takoradi was already expanding and contributing to the growth of Ghana's GDP. The Ghanaian Government was intent on making the best out of the expected revenues of the discovery and plans for physical and legal infrastructure were underway.

The presence of an established business climate in the city helped in its publicity as the future petroleum city of West Africa. There were an active base in the fields of transportation, trade in timber, gold, cocoa and other resources from the inland. Also the function of ports of Sekondi and Takoradi and import and export destination helped create a pathway for the transportation of the produced petroleum.

Also, when the last public census before the discovery was made in 2000, the Sub-metropolitan area of Sekondi had 114,157, while that of Takoradi had 175,436 (Ghana Statistical Service 2005); an established population base and market that would provide the needs of the incoming petroleum industry in terms of labour and services. USD 20 Billion in revenues were projected by the International Monetary Fund between 2012 and 2030 (Nguyen 2012). That prompted the Ghanaian Government to pay more attention to the infrastructure needed and help publicise the city for international investors, in anticipation for the economy to boom.

4.2.2.1. Mobility

The development of the port and railway facilities was central to the development of Sekondi-Takoradi. The ports were important for fishing and commercial activities. It gained more prominence in colonial times for the shipment of African goods and later slaves to other destinations in the world. Then by the late 19th century the British Administration in the region established the railway which remains to this day part of Ghana's national transport infrastructure. When the British relocated the Railway administration from Sekondi to Takoradi in the 1920's this help shift the balance of economic development from the former to the latter (Quayson 2012). The national transport system in Ghana focuses on the southwestern region due to its proximity to the resource-rich region in the center and west of the country. Sekondi-Takoradi is linked with Kumasi by railways, which nationally witnesses a decrease in passenger traffic and increase in cargo traffic. Railways in general helped to pull and retain population in Sekondi-Takoradi as it created more economic opportunities and enhanced production in the nearby cocoa fields (Obeng-Odoom 2012). The port of Takoradi on the other hand is one of Ghana's only two deep water ports and is preferred for national exports despite the construction of Tema port in the vicinity of Accra, the capital of Ghana. It is also home to the Ghanaian Navy Western Command,

and it (Berry 1994, Obeng-Odoom 2012). An airport in Takoradi operates domestic flights to other locations in Ghana.

It was also part of the national transport system to focus on road traffic and not railways. This is evident in the little development in railways for examples when compared to roads. Also, it is mainly depended on privately owned transport and not public, both on the urban and regional scales. The situation is getting more intense with the influx of investments to Sekondi-Takoradi and the city is exhibiting more affluence in the circles connected with the petroleum industry; where more people are able to afford private motorised means of transportation on one hand, and the absence of a reliable means of public transport (Obeng-Odoom 2014). Due to this situation, public efforts and investments in maintaining public transport modalities are being eaten away by the increase in private motorised traffic.

The established transport network and port facilities in Sekondi-Takoradi played a major role in cementing the city's position as the country's leading petroleum city since extraction of petroleum from the Jubilee field started; as it presented investors with existing infrastructure from moving their equipment, labour, and products to and from the city.

4.2.2.2. The Service Sector

Despite its economic prominence, Sekondi-Takoradi faced a lot of shortages in the service sector. The city constantly faced shortages in food and housing. And despite presence of nearby farmlands and presence of farmers, fishermen and similar activities in the city, these were not always enough to support the local population and ultimately the city would get its food from elsewhere. Housing on the other hand was also a problem, both in quantity and quality. The rate of construction of new houses was less than that of population growth – 163 percent and 264 percent respectively – in 1970. And housing quality was not good either; only 17 percent of the houses had en-suite lavatory or kitchen facilities around Ghana's independence in 1957.

Since the discovery of petroleum in 2007, new homes have been constructed in response to the influx of workers from other parts of Ghana (Obeng-Odoom 2012). However, not all companies working in the petroleum sector provide housing or transport services for their workers. Some workers still have to commute frequently between their work in Sekondi-Takoradi and their homes in other cities like Accra and Tema. Also, some of the companies do not provide transportation for their workers at all, or restrict transport service between company facilities and local transport stops like the airport.

Also, the introduction of the petroleum industry in the local economy helped to shift workers from other service sectors due to lucrative payroll and inability of the other sectors to compete with the capital of petroleum. The drain of skilled workers and new entrants to the labour market being unwilling to join brought about their decline (Ablo 2012).

Among the sectors that benefited from petroleum was technical education. The proficiency of local workers had been an issue for a long time. The German Organisation for Technical Coopoeration (GTZ – now Germal Organisation for International Cooperation, GIZ), established the Takoradi Technical Institute (TTI) in collaboration with the Ghanaian government. Later TTI hosted Africa's first fab lab which was funded by Massachusetts Institute of Technology (MIT). TTI expanded to include courses and programmes relevant to the petroleum industry in order to train local population (Wikipedia 2015). Healthcare on the other hand is under pressure from the increasing population. The existing healthcare centers are distributed almost equally on the sub-region of the metropolitan area, with the government planning to increase the capacity (STMA 2014).

4.2.2.3. Demography

Historically speaking the coast of the Gulf of Guinea in what later became Ghana was inhabited by Ashanti and Fante peoples who descended upon the coast from further inland and worked in fishing. Their precolonial history has a lot of references to established political and social orders that governed these regions in the forms of many political units and kingdoms that fused and disintegrated, and regularly fought among themselves. The first Europeans to arrive to the coast were the Portuguese in the later part of the 15th century. However, they were later expelled by the Fante. The Portuguese were followed later by the Dutch and British, with the later managing to form stronger ties with the local populations and outlasting and even buying off other European existence (Stocks 2009, Quayson 2012). The coastal cities continued to represent urbanised settlements with better quality of living and services than the predominantly rural hinterland. That was further manifested with the establishment of colonial authority by the British in the late 19th century; where the population of the colony of Gold Coast and later Ghana were linked to the British sphere of influence in those settlements for acquiring those services. This was evident in the number of people joining British educational facilities in future Ghana who would also go to carry on with their further education in Britain.

Generally speaking Ghana has a population pyramid with a wide base indicating abundance of youth, with the group aged 24 years and younger constituting 55.2 percent of the population. There is no large difference between male and female residents of the city, constituting 60 and 63 percent of the population respectively (Ghana Statistical Service 2010). This raises the demand for new jobs and warrants investment in labour intensive opportunities. It also gestures to the importance of education in transforming this population mass into active human resources.

Focusing on Sekondi-Takoradi, the city had a population of 103,834 in 1970 that increased five folds by 2010, reaching 559,548, with only 22,037 – less than 4 percent – in rural communities. This is contrary to the rest of the Western Region, which is 57 percent rural. The population is also 92 percent Ghanaians by birth, 4 percent by naturalisation, and the rest are foreigners, mostly from neighbouring West African

Countries. It is also important to notice the increase in number of internal migrants – arriving from other parts of Ghana. Numbers emerging for the 2010 census indicated a spike in internal migration since the discovery of petroleum (Ghana Statistical Service 2010).

The increased percentage of young people couple with increased rural-to-urban migration created a situation of mass delinquency. Even in pre-petroleum times the city attracted the rural population looking for better quality of life. With the increased work load for parents to support their families, a lot of juveniles were left unattended. The city featured signs of failing social structure as a growing percentage of juveniles had to support themselves. Coupled by the endemic housing crisis, that group of the population took shelter in the streets. With the increased competition and rise of costs of living, they started looking for illegal venues for making money. Theft and prostitution were among those illegal activities. Another thing is the absence of security institutions; Takoradi did not have its own police station until 1975, and the police force took more time to establish active control (Obeng-Odoom 2012).

4.2.2.4. Spatial Dimensions

Sekondi-Takoradi Metropolitan Assembly is made up of four localities, called Sub-Metro areas. These are Sekondi, Takoradi, Essikadu-Ketan and Effia-Kwesimintsim. The direction of spread of urbanisation can be determined from the map as to have happened along the coast, with roads and other services decreasing as we go inland. Accordingly, major roads and transportation networks are stretched parallel to the coast, and little of it is going northward towards the farmland. As mentioned before, a railway link to Kumasi in the Central Region is important for the transportation of raw materials to the export terminal in Takoradi port (STMA 2013). Also, the city gets less dense in the inland direction, where it is surrounded by farmlands and forests.

Figure 10 Map of Administrative Divisions of Sekondi-Takoradi (Source: STMA)

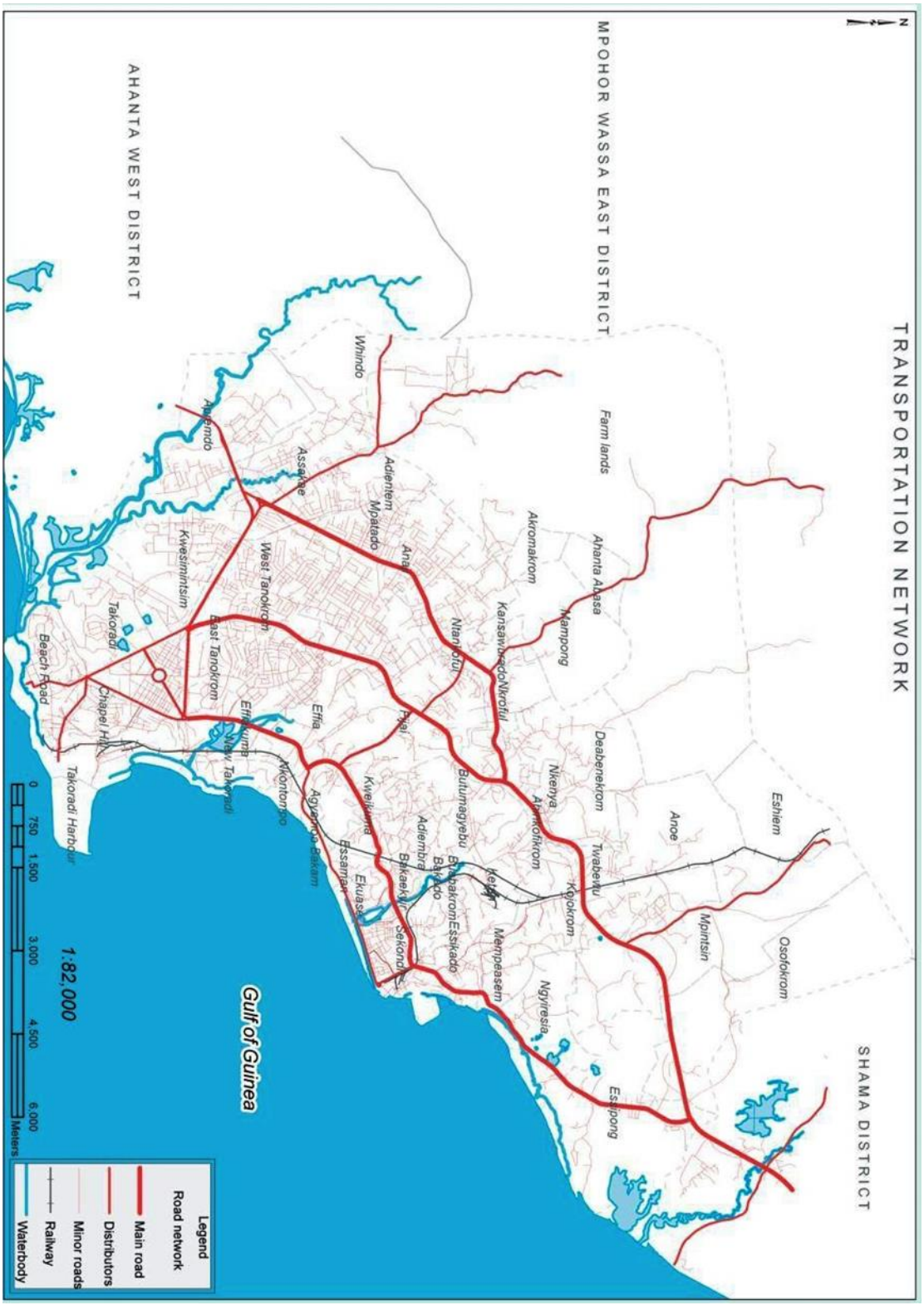

Figure 11 Transportation Network Map in Sekondi-Takoradi (Source: STMA)

Figure 12 Land Use Map of Sekondi-Takoradi (Source: STMA)

With the exception of the industrial area in the northeast, most of the business and commercial activities lie on the coast or near to it. These activities also expand along the main east-west corridors of the city. This concentration of activities is more visible in two nuclei around the centers of Sekondi and Takoradi sub-metropolitan regions. The center of Takoradi for example is the famous Takoradi Market Circle, otherwise known as simply the Market Circle. Fishermen and traders working in the ports usually sold their produce in market circles, while port workers go there to find additional means to earn their living (Obeng-Odoom 2013). The Market Circle was planned and built when the city of Takoradi was built in the early 20th century. Being the most important of the circle, a large number of the local population use it to get their needs. By the 1980's the Market Circle had no more spaces for new traders and STMA built a new circle further north, however traders refuse to relocate due to the distance between the new location and the commercial hub of the city (Amiteye 2015). The Takoradi Market Circle can stand as an example of how the petroleum discovery affected the physical structure of Sekondi-Takoradi and vice versa. The city was planned and built during colonial times where it had its share of infrastructure and services. With the development of the economy the city expanded, and it attracted more people from other parts of the Western Region and beyond, this led to the deterioration of physical structures like the Market Circle. So in order to make more room for traders and keep them working in the area, STMA devised plans to provide more services and upgrade the structure itself to maintain the functionality of the Market Circle. The same goes with the city itself. It is the commercial hub of the Western Region, but with the discovery of petroleum and the influx of people and capital moving into the city. Their operations generate pollution, and so the operations of traders in the Market Circle generate filth, and in both cases STMA has to work hard to create a better more attractive business environment.

Figure 13 Satellite Image of the Market Circle (Source: STMA)

4.2.2.5. Current Trends in Urban Development

The role of oil extraction and processing in establishing economic development in Africa is still not clear despite the proven reserves of the crude oil abundant in the continent. It can be both a blessing and a curse. The curse-blessing dichotomy is distributed along class lines and is supported by social contracts and power structures within the urban sphere. Using evidence from Ghana's Sekondi-Takoradi, it was found that the oil industry has led to stimulation of the local economy through new investments in construction and real estate, and job creation both directly and indirectly. It was also found that distribution of impacts and ramifications of oil on the local economy is greatly affected by the integrity of the governance structure, whereas weaker and corrupt local governments lead to the lower, weaker strata of the local society bearing the brunt of adverse economic, social, as well as environmental effects, eventually being marginalised or crowded out of a seeming prosperous and affluent economy. This means that local and national governments should be strengthened through appropriate legal and institutional frameworks in order to fend off their constituents from the adverse effects of the industry, ideally by increasing their accountability and mastering the role of facing off private investors to make sure that the process of oil extraction is governed by law (Obeng-Odoom 2013).

As with other petroleum cities in the world, the discovery of petroleum brought about contest for land. And in turn, this contest led to multiple disputes that had social and economic ramifications. Among these disputes over land rights are evictions and terminations of usage by landowners who would terminate an otherwise legally binding tenancy agreement for land and real estate in general for a new demand from a richer competitor. This also brought problems related to land rights and whom they lie with. Some lands owned by several members of the same family would be sold off multiple times by more than one faction of the same family disputing ownership. The same would happen upon disputed ownership between two or more chiefs. A chief is generally a patriarchal figure who represents the rights and interests of a member group of a certain ethnicity in Ghana. The laws pertaining to landownership and related disputes have to be revised and a dedicated arbitration apparatus has to be put (Ernestina 2016).

When it comes to the resource curse-blessing paradox, research has often overlooked the power that institutional framework has over the process. The shift from blessing to curse or the other way around is tipped off by the strength and integrity versus weakness and corruption of governing institutions. These institutions play key roles in safeguarding public interest and warding the society from the negative effects of the influx of cash and migrant labour. The strength of institutions can also guarantee the fair distribution of revenue within the immediate vicinity of the projects that would help mitigate the negative economic and environmental impacts of those projects. This role is becoming more and more important as the extraction and production of oil lie in the hands of powerful transnational conglomerates with no consolidated affiliation to a certain location, nation, or group of people. The breakage of those

conglomerates from social bounds necessitates the importance of strong governance on the local and national levels. It is also important to measure the exchange of impacts between a fixed location on the map - like a city or township – and the global capitalist machine in the field of oil industries. In that since, it is important to notice that the oil industry in Ghana as a whole is relatively new as compared to other more established oil producers worldwide; the parameters and institutions governing the industry in Ghana are still in formative phase. However, the resource curse-blessing paradox is clearly evident in the picture where policymakers are trying to establish roles that would bolster the positive role of the oil industry on development and avoid falling into the category of the curse (Obeng-Odoom 2015).

Local taxation of land property can provide for enhancing the infrastructure that those property owners depend on partially for increasing their values. The application of this taxation system is greatly influenced by the existing political, economic and social construct. The institutionalization of exceptions can affect the application of these taxation measures especially when the local governments apply them in order to attract investors. In Sekondi-Takoradi the influx of oil related capital and investment had led to increasing demand on property. The local government of the Sekondi-Takoradi Metropolitan Assembly has opted for the application of a number of attraction measures to lure investors which include exceptions from property taxation schemes. While mostly governments depend on taxation relevant to oil rents when it comes to profiting from oil production, when it comes to indirect revenues associated with oil governments in developing countries are lagging behind the investors (Obeng-Odoom 2014). The governing structure in the petroleum sector is also important. The sector was largely deregulated until specific regulations and organisational structure were put in place in the 1980's with the establishment of the Ghana National Petroleum Corporation (GNPC). Though petroleum had been prospected for in Ghana since the late 19th century, there was no consolidated governing structure to manage the process (GNPC 2018). The government of Ghana is caught in a place where it has to balance between the interest of their people and creating a potential attraction for investors, including the provision on amenities and logistics.

4.2.3. Conclusion

The city of Sekondi-Takoradi was an established economic and social hub of the Western Region of Ghana and beyond before the discovery of petroleum. Population growth had been significant in the city even before the Jubilee offshore field became operational in 2007. Accordingly, it is still early to discuss the full range of the symptoms of the Boomtown Syndrome in the case of Sekondi-Takoradi especially that the city had an initial transport-related boom when it was first established in the early 20th century that was more or less sustained during colonial rule and after independence.

The existing literature is more relevant to the social impacts of the expected boom. This includes the impact of the boom on rural-urban migration, gentrification and crowding out of the urban poor, delinquency and prostitution. On the other hand, evidence from the literature shows Ghana's government intention in capitalizing on the boom for the development of Sekondi-Takoradi, the Western Region and the whole of Ghana. This is evident in the effort to create the legal bases, maintenance and upkeep of infrastructure and attraction of investors. However, it is important to mention that so far the developments provided by the government are directed towards the investors, not towards the residents of the city. An example of that would be the focus on investing on road transport and not on any other means of public transport or railways.

4.3. Ras Gharib

Figure 14 Satellite Image of Ras Gharib (Source: Google Earth)

4.3.1. Introduction

The city of Ras Gharib lies on the western coast of the Gulf of Suez, at the northern extremity of the Red Sea. Administratively it is part of the Red Sea Governorate in Egypt. It has been an integral part of the country's petroleum industry for more than a century.

There is no evidence for a permanent settlement at the site prior to the discovery of petroleum in the area with the exception of the lighthouse that was commissioned in 1871 by the famous French engineer Gustav Eiffel (Wilkinson 1832, Richards and Clark 1870). From that time on a limited number of people manning the lighthouse were stationed there and provisioned by sea from Suez, as with the rest of the lighthouse facilities on the entire Red Sea coast in Egypt. This is due to the lack of subsistence in the desert hinterland, albeit with Bedouins herding sheep and getting their water from nearby wells (Tregenza 1950).

The first site with proven petroleum capacity was further south along the coast in Gebel El Ziet - the Arabic translation of Oil Mountain, where travellers could observe crude oil bubbling from below the rocks. This attracted the attention of the Egyptian State as well as private - mostly international - investors to come to the region and start prospecting for petroleum. The Royal Dutch Shell Oil Company and the British Petroleum Company established a joint venture in order to start their business in Egypt, establishing the Anglo-Egyptian Oilfields Company (AEOC) in London in 1909 and started operating in Egypt at 1911. They first worked in Gebel El Ziet, then

in Hurghada before moving to Ras Gharib in 1938. By the next public census in 1947 the town had 3799 residents (Hamdan 1950). AEOC kept their refining operations away from Ras Gharib, in Suez closer to the main markets in Cairo. That limited the economic development potential in Ras Gharib to petroleum extraction.

4.3.2. Ras Gharib: A Boomtown?

As mentioned earlier, Ras Gharib did not have any permanent settlement before the start of petroleum extraction work by AEOC. Aerial reconnaissance photographs taken by Luftwaffe pilots surveying the petroleum production in the area during World War II showed no sign of town structure on the site.

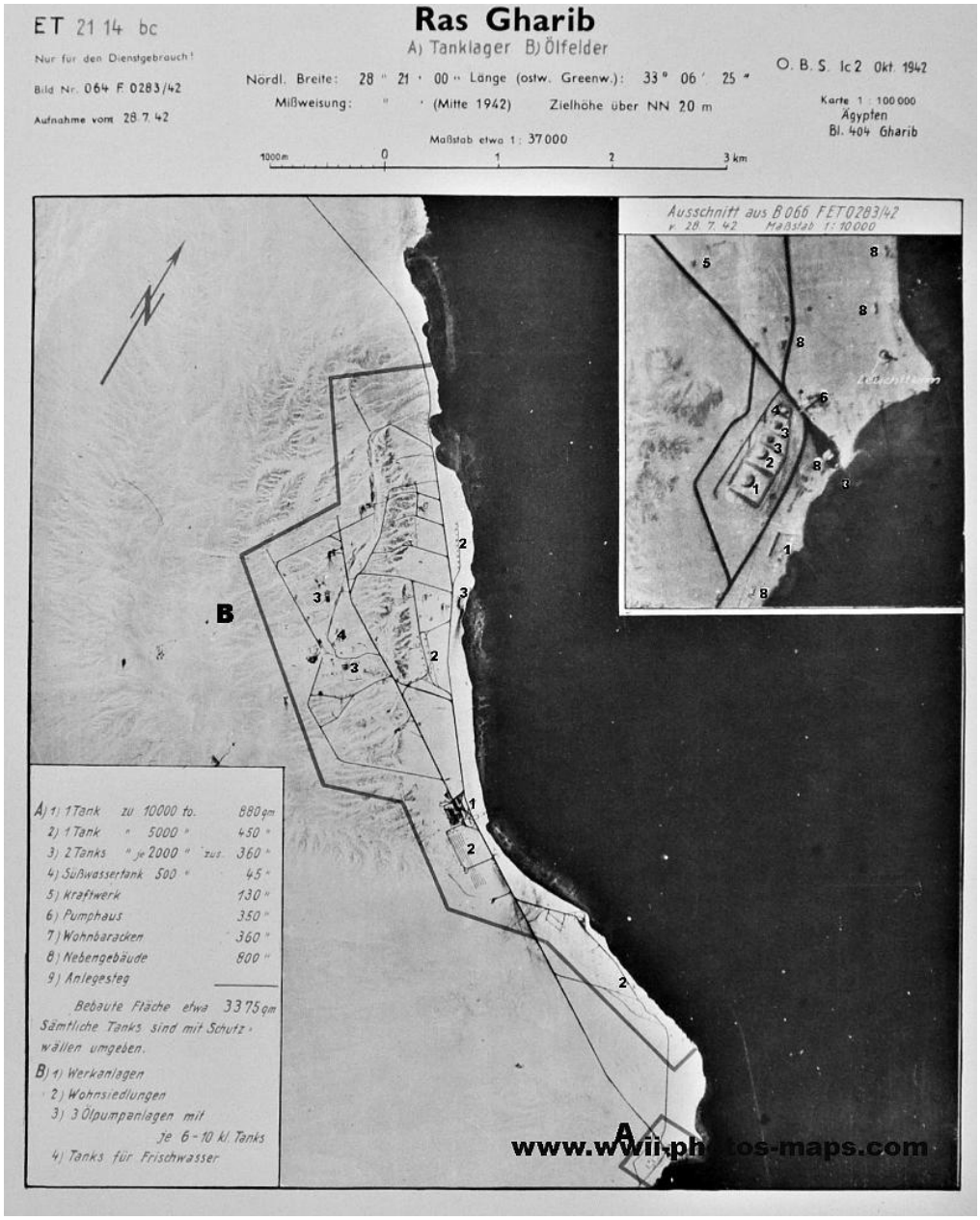

Figure 15 Luftwaffe Aerial Reconnaisance Photograph of Ras Gharib (Source: WWII Aerial Photos and Maps, by License of Luftwaffe Museum)

Ras Gharib Municipality was established in 1962, and in 1964 AEOC was nationalised and their operations were transferred to the General Authority for Petroleum Affairs (GAPA) and split between two subsidiaries; Al-Nasr Petroleum Company, which took over the refining facilities, and the General Petroleum Company (GPC), which took over the extraction facilities around Ras Gharib. To this day GPC remained the main employer despite the opening up of the market for other private petroleum companies. Jobbins describes Ras Gharib as a company town that developed after the discovery of petroleum into an industrial metropolis with lots of amenities and services like a hospital, banks, a hotel, and some other services that the author listed (Jobbins 1989), while Sims described it as a stunted dwelling of 28,000 around 1996 despite its petroleum and gas potential (Sims 2014). After the 2011 Revolution and the political and economic upheaval that happened in Egypt the petroleum sector suffered a lot after foreign investment chocked on fears from inability to remit the revenues abroad. This limited the expansion of the of the petroleum sector and heightened the importance of GPC as a stable employer as it was state-owned.

Ras Gharib as a city did not get the amenities that would allow its residents to show the affluence perceived by the general public about people working in the petroleum sector. For example, until 2017, the city had the population of around 56,000 residents, and despite the fact that it is served by a 28-bed hospital, well below the national average (CAPMAS). Another 87-bed hospital was being built at the time of writing this thesis. The residents tend to travel for great distances in order to get what they need.

4.3.2.1. Mobility

For most of its time in existence, Ras Gharib had remained partially isolated and hard to reach. It lies on the coastal highway between the larger cities of Suez to the North and Hurghada to the south. Travellers to and from Cairo had to go by the way of Suez first. There is also a road across the Eastern Desert that links it to the Nile Valley in Elminia Governorate. At the time of commencement of petroleum work, the location was provisioned by sea from Suez. It was also accessible by the local Bedouin tribes that lived in the valleys and mountain slopes of the Eastern Desert near wells. Those Bedouins were recruited by the British for the provision of supplies and security for their petroleum extraction sites (Tregenza 1949, 1950). Other than the main roads, the location was also accessible through a network of desert trails and wadis (pl. wadi; a dry desert valley) known only to the local tribes (Tregenza 1950).

During much of the time after the 1952 Revolution until the early 1990s, most of the Red Sea coast of Egypt was only accessible after permission from the military as it was treated as a front during the Arab-Israeli wars (After the War of June 1967 and the Israeli occupation of the Sinai Peninsula, Both Al-Nasr Oil and GPC moved their operations elsewhere, with GPC in particular starting to prospect for petroleum in Egypt's Western Desert). The Oil facilities in the vicinity of Ras Gharib were not

directly targeted due to its proximity to the Ras Gharib Lighthouse, which is protected by the international conventions governing armed conflicts.

Due to lack of services in Ras Gharib, the residents travel to nearby cities to get their needs. The closest city is Hurghada, the capital of the Red Sea Governorate, is 150 kilometers to the south. For some residents in Ras Gharib this is a daily commute (Personal Interview). It is also the perception of the local population that people working in the petroleum sector originating from outside Ras Gharib tended not to invest in the city due to the obvious lack of services and amenities. While on the other hand, successive generations from the same family would work and reside in the city, namely working for GPC. This is an indication of the limited social mobility in the city, which was further manifested after the post-2011 investment crunch. As of then the petroleum sector started looking less appealing while people working in other sectors, especially those with technical backgrounds and working in the local government in the same time, started contemplating abandoning the cities for other places in the country and beyond (Personal Interview).

Ras Gharib did not exhibit the hypermobility characteristic of petroleum boomtowns. The reasons for that are attributed to either physical reasons like its remoteness from any economic attraction other than petroleum, and to political reasons which limited the movement of population from its inception up till the 1980's.

4.3.2.2. The Service Sector

AEOC was responsible for providing their staff with all they needed for their lives. They provided housing for their staff; the management staff of the fields stayed in houses with stone foundations which were slightly elevated from the surrounding ground, walls made of a mixture of masonry and wood, with tiled roofs. These houses were located on the seafront, with plenty of space between units, allowing for more privacy. The workers on the other hand were stationed in brick houses with wooden roofs that were built in rows looking slightly like trains, and hence nicknamed by the local population as *'Masaken Al-Qutorat'* – Train Houses. Those were significantly denser and located closer to the company's main site at the northern part of the town.

After nationalisation, GPC continued to be the main services provider in Ras Gharib; allowing all residents – even non-GPC employees – to commute using GPC vehicles free of charge, providing meals for school children, healthcare for employees, and recreational facilities to the public, some in collaboration with the local municipality. GPC continued to offer housing for their staff resulting in most of the urban expansion of the town. The tenancy agreement that governed the relationship between the company and its workers was a so-called Lending Contract. It is a form of tenancy which allows the tenant to use a unit free of charge, for a fixed term - in this case employment – without transferring ownership. As with rental, the tenant cannot introduce any permanent change to the unit without prior permission from the owner, and is obliged to return the unit to its original situation by the end of the term. In rare

cases, the company built houses for its employees who would then buy them through a long-term lease-to-own agreement, paying it off through instalments deducted from their salaries.

Figure 16 Ras Gharib Southern Area Housing (Source: Kosta Mathey)

Figure 17 GPC Employee Housing (Source: Kosta Mathey)

The city has no cinema, and only serves cultural events in the local government-operated *culture palace* (state-owned and operated venues for cultural events all over the country). And despite being a coastal city, it has no public beach close to the urban population. The nearest public beach is around 5 kilometers south of city center and is totally isolated and almost abandoned, the other beach is inside the GPC camp and is accessed only with special permits. And for the residents living in houses with a sea view, instead of enjoying it, they are rather faced by a skyline littered with oil platforms and a shoreline strewn with lumps of crude oil condensate (Site Visit Report). Swimming in the local waters is both hazardous and grotesque as swimmers would have to bath in cooking oil and scrub crude oil off their bodies afterwards (Personal Interview). The presence of international companies did not alleviate the deteriorating service condition; those companies could afford to send their staff for out-of-town, better-off healthcare, social and cultural facilities.

Some steps were taken in order to try to remedy the situation in Ras Gharib through imposing tighter control on oil spills that from time to time happen and endanger the marine environment. Earlier in 2016 the local government started a project to create a local public beach within city limits by clearing up those oil lumps and spills (Ras Gharib Local Government).

4.3.2.3. Demography

As mentioned earlier Ras Gharib had no population prior to petroleum works. The nearest groups of people were Bedouins living in the desert near wells. Most of the workers who came to work in the area came from Upper Egypt, particularly Qena. The people of Qena, some of them of Arabian descent whose ancestors came to Egypt from the Arabian Peninsula across the Red Sea during the Muslim Conquests of Egypt, maintained social and economic ties with the Bedouins of the desert littoral of the Red Sea. The Bedouins would regularly go to the Nile Valley at Qena and the surrounding region for their supplies of grain, foodstuff and provisions in general (Tregenza 1947, 1949, 1950, Power 2014). The routes between the Nile Valley at Qena and the surrounding region and the Red Sea were well-known passages dating back to Ptolemaic times and beyond (Tregenza 1947). This link between the Red Sea coast and Upper Egypt allowed for movement of people and trade in either direction. Nowadays most of the families of the modern day Red Sea Governorate can trace their lineage to Upper Egyptian ancestry. It started with Hurghada, and the situation in Ras Gharib was not different. Some of those actually named their new locations in Ras Gharib after their ancestral hometowns and villages in Upper Egypt, like the locality of *Elhirajeyah* next to the GPC camp in the northern end of the city, named after a village in Qena. However, there are no clear data on the size or dates of these population movements. Also, statistically speaking, it is even harder due to the fact that not all people moving to Ras Gharib change their official addresses to their new addresses despite owning or renting property in their new homes. They also tend to maintain property in their ancestral hometowns and villages in Upper Egypt and frequent those places with visits during holidays.

This also meant that the community in Ras Gharib is an extention of the Upper Egyptian community with all its characteristic features like stronger family bonds and ties, hierarchy, and patriarchal control, especially over women.

Later waves of migrants came from Elminia in northern Upper Egypt. Those came along the road traversing the Eastern Desert from the village of Elshiekh Fadl directly to Ras Gharib. Those settled mostly around the northern camp of GPC and contributed to the enlargement of the informal area called *El'eshash* – the Shanties. The informal area was densified with the arrival of more migrants from Elminia in the wake of the 2011 Revolution seeking better living (Personal Interview). However, with the declining investments in the petroleum sector in the city and the flight of foreign investors, the aspirations of the newcomers were not met leading them to settle for lower qualities of life and resorting to illegal activities like smuggling and illicit trade in narcotics (Personal Interview).

4.3.2.4. Spatial Dimensions

Ras Gharib grew from a land prominence in the coastline of the Red Sea (Richards and Clarke) to a city with an area of 14890 square kilometers and a population of roughly 60,000 residents (Red Sea Governorate). Geographically speaking it has a roughly rhomboid shape, with the northern extremity representing GPC north camp and the informal area, the eastern sides from north to south representing the coastline, the southern extremity represent the southern petroleum facilities and landing strip operated by petroleum companies, and finally the western extremity representing the cities expansion towards to coastal highway linking Suez – and Cairo – to Hurghada further south.

The city has two growth axes; the first is from north to south running from the northern GPC camp to the Southern Area housing for the administration of GPC – waterfront development, while the other is from east to west, running from the western entrance to the city, at the intersection of the coastal highway and the road to Sheikh Fadl on the Nile Valley. The core of the city is an area of commercial and administrative use, with the main market, bank, city administration and hospital in the same area. Its growth, however, was determined by two important factors; the petroleum industry and the military. The military had certain rules regarding the height of buildings which is dictated through a map for each city on the Red Sea that designate the allowed heights in order to allow for proper observation of the approaches over the coast. One the other hand, other than the fact that people populated the area initially to work in the petroleum industry, the actual layout of the city is also affected by it. The denser more populated areas are those closer to the main petroleum industry facilities to the north. Certain rules are also mandated by the petroleum industry like the prohibition of any construction activity within a 500 meter radius from the storage tanks on the hill south to the city. The city is also affected by presence of pipelines in some areas of the city which have their own safety distance

around them, as well as affecting the street layout in points where roads and junctions cross path with those pipelines (Almoghazy 2018).

GPC and AEOC before it were the main providers of housing in the city, i.e., promoters of urban development in the city. The expansion of the city followed the path of the two intersecting axes. However, GPC's policy to switch from permanent labour to workers on 2 weeks rotations living in camps meant that the role of housing provider was shifted to the local government. In the strategic plan for the city issued in 2000, the western side of the city located to the west of the main urban mass and east of highway was parceled and allocated as plots and parcels for people to build their houses on. Also another location in the area was designated for the social housing units provided by the – central – government. According to interviews conducted with local government officials, all the plots are already sold but at the time of the site visits on 2016, almost none of this western extension was built with the exception of the social housing units. That plan also included a remodeling scheme for the informal area which included cutting wide streets through the built up area and the introduction of integrated local service areas, but that part of the plan never came through.

A new strategic plan is currently underway, which is as of late 2016, had ended the analysis phase. It is still not implemented, although the government is still building social housing units in the areas designated in the previous strategic plan.

Figure 18 Ras Gharib Strategic Plan 1981 (Source: GOPP)

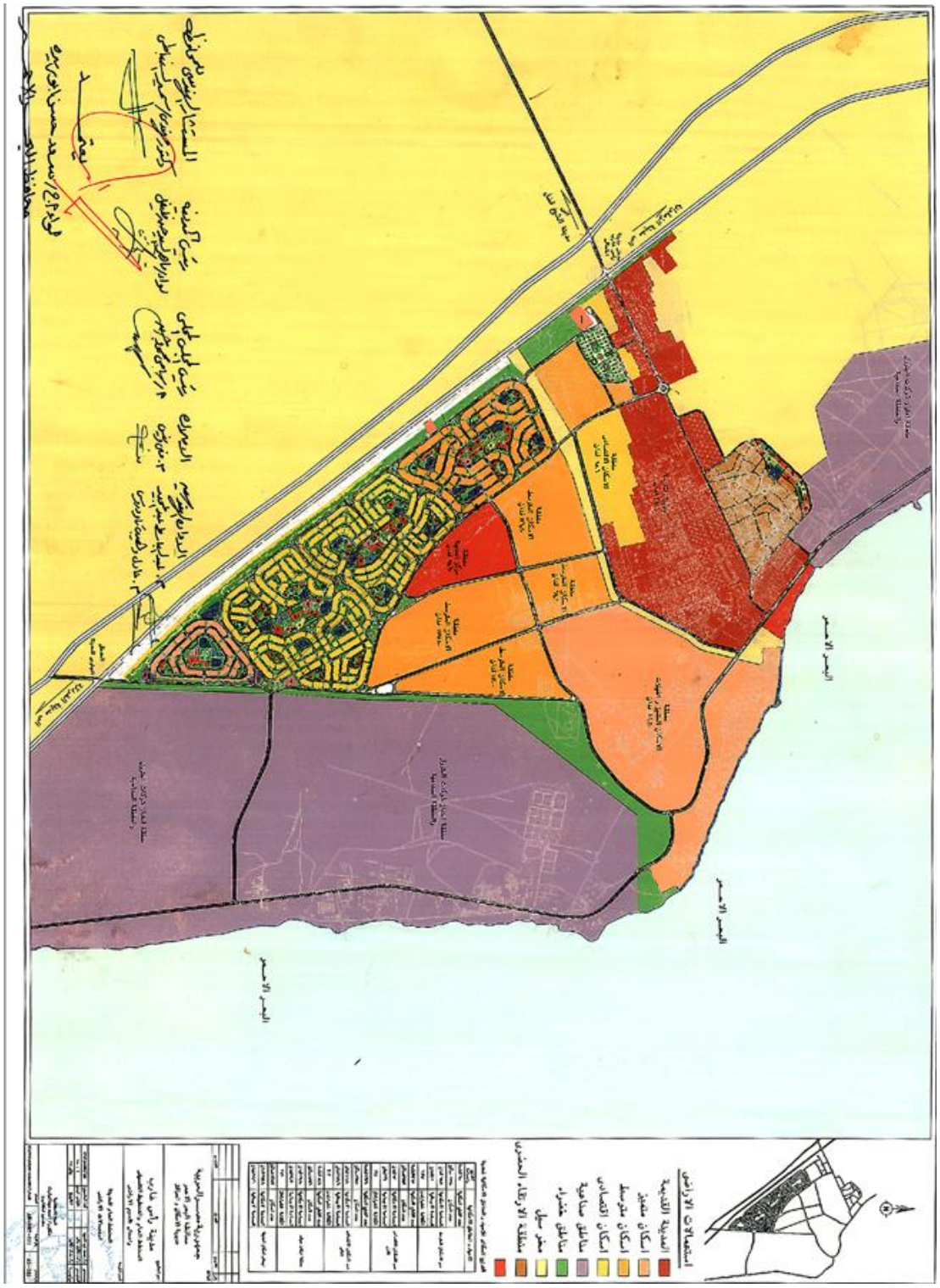

Figure 19 Ras Gharib Strategic Plan 2000 (Source: GOPP)

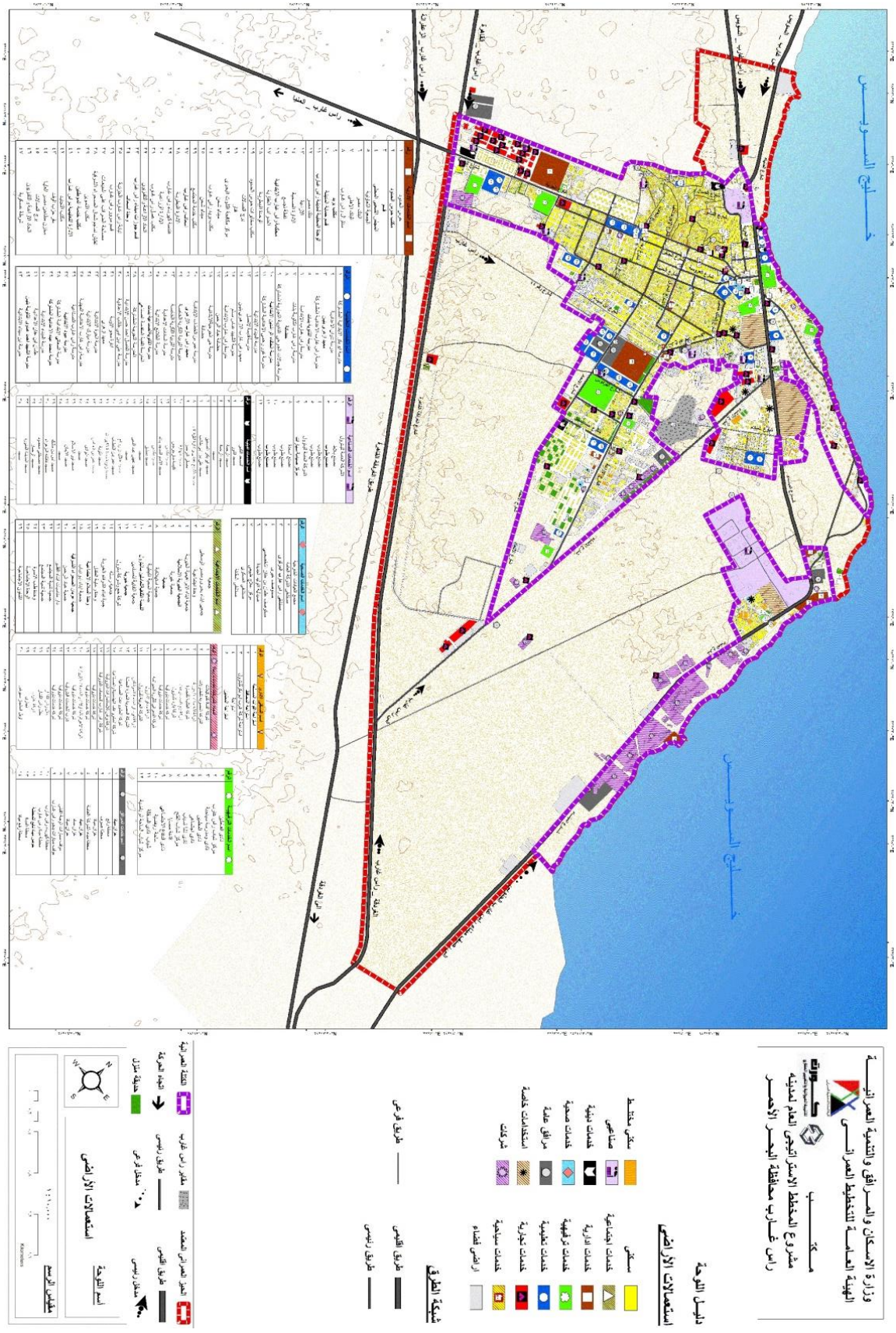

Figure 20 Ras Gharib Landduse Map 2016 (Source: GOPP)

4.3.2.5. Current Trends of Urban Development

In 1983, the GAPA became the General Petroleum Authority (GPA), changing from a public agency to a state-owned holding company, with subsidiaries – like the GPC. That would set the stage for the neoliberal changes due to happen in the following decade. GPC continued to be the main service provider in Ras Gharib, expanding with its population until the early 1990s, becoming very intertwined in the lives of its people. But in 1991, law 203/1991 was passed as part of the structural adjustment policies imposed by the World Bank, paving the way for neoliberal changes that would reshape the Egyptian public sector.

The first step was shedding off all the possible costs that 'burdened' the public sector; namely services provided to workers. As employees began to feel the impact of this retreat, the GPC Workers Union pressed the company administration to sell them the units occupied by them. That demand was positively received at GPC as it meant that the cost of maintenance and utilities of the aging buildings, which in 1997 was EGP 7.7 million, would also be transferred to the workers. At the same time, instead of having permanently residing staff, GPC was preparing a new shift-based labour camp in nearby Ras Bakr, signalling an end to the employment of permanent workers.

However, the legalities of selling the homes were complex, as the company did not own the land the buildings occupied, but was awarded a concession for a set term to use it for oil extraction. Once the term ended, it was up to the government to obligate GPC to remove these buildings or transfer ownership to the government.

Thus, GPC proposed to hand over the housing blocks to the Red Sea Governorate, who would in turn assign them to the tenants. This meant that GPC could not sell those homes directly to the tenants, and both parties needed the government to act as an intermediary to finish the deal. The 936 units had a total book value of 3.3 million EGP in 1998, which after depreciation would be EGP 961,000. This of course is just an accounting value, used to transfer assets from GPC to the Red Sea governorate, and not the actual price the units will be sold for to the employees.

However, this transaction left out the 105 units of stand-alone executives' houses on the seafront. Over half (69 units) were assigned to their GPC occupants by means of hereditary 'lending' contracts which are a life-long lease that can be passed on to the tenants' heirs. The tenants of those units varied between – then – GPC employees, retirees, and heirs of former employees. This means that tenants can stay in those houses for as long as they want, and as long as the houses are standing, but they cannot sell them or buy them. The rest of the seafront houses have a number of uses. 15 are used as guesthouses for visiting company personnel, 13 lodge visiting contractors, and six are in use by government agencies including the Mayor, Army Intelligence Department, the Police Inspector, Police Prefect, and Traffic Inspector. A further two houses were lent to an individual and an NGO for their services to the local community.

But the GPC employees, retirees, or their heirs who have the lending contracts, were recently given eviction orders by GPC, even though the lending contracts clearly state that they cannot be broken, while the tenants were also able to acquire GPC approval in 2012 to buy the units they occupy. Twenty of them went on hunger strike last month to protest the orders, amid rumours that GPC, along with the Red Sea governorate wish to capitalise on this lucrative seafront location, as part of a new national asset management policy.

4.3.3. Conclusion

With a view to international examples, Ras Gharib poses as a quite peculiar example of petroleum cities or resource-based economies. Instead of being a fully-fledged city with acting government, Ras Gharib was managed more like a colony and less like an actual city. At first, the *coloniser* or the body responsible for managing the affairs of the city was the petroleum sector, whether it was AEOC or GPC. Following the establishment of the city council in 1962, the petroleum company still had the upper hand in the affairs of the city as it was the primary employer on one hand and on the other, most of the city was built on concession lands that were given away by the GPC. Also, most of the *settlers* of that colony were and still are GPC employees. And due to the nature of the petroleum sector in Egypt, which was controlled by the state for most of the time since it started, there was no room for actual competition that would allow for the development of a demand and supply for services and commodities, including housing. And even though the government is currently expanding its role in service provision in the city, the situation is somewhat unclear as the government would be in for filling quite a big void. In sum, the city was not like other petroleum boomtowns around the world: it was never allowed to boom in the first place.

5. Summary, Conclusions and Recommendations

5.1. Summary

The Boomtown Phenomenon, the Boomtown Syndrome and Boom-Bust Cycle are parts of the spatial manifestation of extractive industries development. They represent a chronological development of city structure in response to introduction and withdrawal of an acute economic stimulus. The prognosis of the boom depends on a number of predisposing factors and is manifested in a number of symptoms. Among the predisposing factors are geographical causes like proximity to the site of the resource extraction and abundance of other resources like water and farmland that are necessary to sustain the population. Other artificial causes are the presence and sustainability of means of transportation that would enable the transportation of labour and machinery to the site and the transportation of the product to the market.

The manifestations of the boom have both social and economic ramifications and they are dependent also proportional to the predisposing factors. In the initial phase of the boom there is a sharp increase in the population. The population can be divided in two large groups: the first would be the ones directly linked to the development with prescribed roles, like petroleum workers in a company developing a petroleum field. The second group would come seeking opportunity to catch on the benefits of the boom and offer their services, acting like auxiliaries to the petroleum industries. However, those *auxiliaries* do not provide strictly legal services, if any service at all. Bankers, lawyers, healthcare providers and many other professional groups provide positive assistance needed in the maintenance of the petroleum extraction activities and retention of the population. Other groups perform illegal or quasi-legal activities that can gent endemic in a burgeoning population with little or no definitive social norm. Such groups include prostitutes, illicit narcotics dealers, as well as other groups seeking the obscurity provided by the turbulence present in such communities.

This sharp increase in the population presents a strain on the existing local services. As a result, it is very common in boomtown to exhibit an initial phase of degradation of quality of all services due to two things; first would be slow investment in the service sector to catch up with the demand, and second, in the case of a recurrent boom, the reluctance of investor to spend money on the provision of permanent or durable services knowing that there investments will be void once the boom phase is over. This includes housing, where the increase in demand coupled with the presence of more money in the hands of workers in the petroleum industry leads to high rents and crowding out of the original residents. This goes with all services and commodities which can result in inflation if not properly managed.

Physically those settlements exhibit consumption of open spaces whether in the center or on the periphery. This can lead to the limitation of public open space and its constriction, the remedy of which can be costly in both economic and social terms. An example can be the construction of needed infrastructure like necessary roads through

existing dense urban masses due to the social and economic costs of eviction and/or compensation. The other direction for expansion would be outwards. This can cause the city to consume surrounding fragile environment or to expand into natural disaster-prone areas.

The progress and outcome of the entire process are dependent on the governance structure of both the petroleum industry and urbanisation. In the cases where the boom gave in to a bust it was either developers – individuals or entities – from outside the community who came in to invest in the extractive industry, or a monopoly by a – state-owned – entity to run the business. In both cases the benefits was not invested in the community and most of it was remitted to other places, either in the same country or abroad. In some cases it was a combination of both, where transnational corporation would coalesce with national governments to exploit the resources in a certain community. In some of those cases the government would subdue the local population in cases of dismay against adverse economic, social, or environmental impacts of the development.

Better results could be achieved in cases where the petroleum market is open to private enterprise and the government acted as regulators and guarantor of the rights of the people. Private developers were encouraged to engage in petroleum extraction and the benefits were much widely shared. In case of deregulated or unregulated markets the negative impacts were much widely shared as well. This was evident in cases where unregulated petroleum extraction and processing gave way to environmental pollution and damage to the livelihoods of the neighbouring communities. From what has been said, it is safe to say that in order to achieve better development goals and not end up with a bust there should be either a locally governed developer so that the community would have a louder say in the utilisation of the revenues of petroleum extraction, or a centrally regulated open market where a central authority guarantees that fends for the interests of the local communities while creating the optimal business environment for the investors in petroleum extraction to work in.

5.2. Conclusions

This work deals with two peculiarities, the first one deals with the petroleum cities as an example of boomtowns, and the second one deals with Ras Gharib as a petroleum city. While the world had witnessed boomtowns as a phenomenon relevant to other extractive activities, like the California Gold Rush of the 19th century, which resulted in the rise and fall of many communities in the American West, the main difference this boom was different from energy resource extraction booms is the role of the extracted resource in the creation of value *downstream*. In the case of gold, gold itself is used as a reservoir of value. While in the case of energy resources they are utilised in further processes of production. Also, energy resources differ among themselves. Coal had been extracted for longer periods of time and utilised for energy generation and other industrial activities. However, coal is harder to transport which tends to

make the downstream activities and forward linkages of the coal extraction industry more localised in the proximity of the extraction site. While in the case of petroleum, it is much more easily transported. This means that it can be easily utilised elsewhere for either generating energy or as an intermediate product, whether in its crude form or after refinement. This makes the petroleum market more global than coal, and gives leverage to international capital over local labour. Accordingly, the downstream activities of the petroleum industry do not have to be located in the proximity of the extraction site. Natural gas is similar to petroleum in this regards, however, the level of sophistication involved in the transport of natural gas is larger than petroleum due the fact that natural gas needs to be either pressurised for pipeline transport or liquefied for tanker transport. This make the petroleum market more decentralised on the global scale, making it harder for cities to capture the benefits provided by the whole range of upstream, midstream and downstream petroleum industries.

The other peculiarity is that of Ras Gharib. Ras Gharib did not have permanent population before the start of petroleum works in 1938. And it was not for around quarter of a century before it was incorporated into a city and had its own city council. And throughout the initial phase of the city's establishment everything the population needed was administered by the company that had the monopoly of petroleum extraction in the area – AEOC and then GPC. This monopoly was also reflected in service provision even after the creation of the local council in 1962. However which time it gave way to a growing role by the local government until – for example – GPC stopped provided their workers with permanent housing and replaced it with labour camps, and instead the task of housing provision was left for the local government. Due to this structure of the petroleum industry in Egypt, which was predominantly controlled by the government, especially in Ras Gharib through GPC, on one side, and on the other side, the controlled life in Ras Gharib, which was tied to a single company – GPC – and affected by many externalities like the location of the city away from other major urban center and close to the Sinai Peninsula, which caused the interruption of economic activities in the area from the late 1960's till late 1970's. And even after the resumption of economic activities in the area, life in the Red Sea coast was greatly influenced by strict military controls which constrained transport on the coastal highway for example. Also, the central government was more occupied with more populous settlements in the Nile Valley and Delta, and even when the Red Sea coast was opened for investments it seemed that Ras Gharib was bypassed in favour of more lucrative and shiny investments in touristic destinations like Hurghada, Qussier and Marsa Alam. Coupled by the stark reality of scarce water resources and dependence on electricity coming from distant power stations, and finished off by the fluctuations in the global petroleum markets, the city was not furnished with neither the physical nor the social infrastructure that would allow for it to grow, and was left in a stunted phase of development, where it seemed to have went directly to the bust phase of the Boom-Bust cycle.

While the cases of Houston and Sekondi-Takoradi exhibit varying degrees of the Boomtown Phenomenon and the Boomtown Syndrome, with evident predisposing factors and symptoms in both cities, the two of them share in other important points that may lead to them taking the same path. Among these points is the fact that though both cities did not exist for long time before the discovery of petroleum, they share in the fact they had accentuated importance of transportation networks, and that railways played important roles in the development of both cities. Also, both cities had functional ports by the time petroleum was being produced at a commercial scale, which gave Houston a shot at becoming the global petroleum industry center that it is today. In this regard, Sekondi-Takoradi is following in the footsteps of Houston, where the city's port facilities were already acting as international export terminals before petroleum. But the most important difference between Houston and Sekondi-Takoradi on one side and Ras Gharib on the other is the ability to sustain a diversified economic base that would provide jobs for a wide variety of workers and employees in the petroleum field as well as other auxiliary and services fields.

5.3. Recommendations

5.3.1. Policy Recommendations

The inclusion of social and economic studies is of paramount importance in planning for resource-based developments. This goes in both the planning phase for petroleum development, and in remedying existing bust-phase petroleum cities. Governments should refrain from considering settlements close to petroleum extraction sites – or any other extractive or development site to that matter – as whole communities living in their own respective settlements and not as colonies, in the sense that they are exploitable for the benefit of a distant group of the population and with total disregard for those living in those settlements. Seen through this colonial lens, this can be either domestic – in case of a centralised planning authority or executive organ of a central state or foreign – in case of direct foreign rule or through transnational corporations.

To that end, it is best to develop a decentralised system of resource management that can more accurately determine the needs of the local population while respecting a national development plan. This can be done through better assessment of the local assets, determination of local needs, and cooperation with other local entities within other administrative entities in the same country, or within other countries in cases with petroleum reservoirs crossing borders.

Also legislation governing the utilisation of natural resources should include clauses that enforce local investment by the developers in order to guarantee the mitigation of bust phase of the Boomtown phenomenon. Earmarking of certain revenues for social services can be a good starting point.

5.3.1.1. Planning for Enhanced Mobility

While a remote onshore petroleum site or an offshore one can be very difficult and costly to access, such sites in the proximity of urban settlements is a different case. The improvement of accessibility to and from such settlements and mobility within them can assist in the preservation of the positive boom effects. Naturally this varies according to the geographical location of the settlement in the first place, but it is nonetheless important. Creating links between the settlement and the nearest urban centers can bolster its position as a production market and lure more investors working in the service sector. Also it enhances the possibility of creating agglomeration of economic activities as such locations have the incomparable advantage of the presence of petroleum – or any other value resource to that matter. Accordingly, and upon the provision of other economic and social infrastructure, those petroleum boomtowns can be turned into production centers depending on the estimate of the reservoirs of petroleum they have. The cost of providing for such enhanced mobility could be shared by the developers and the local government. While the developers would be directly benefiting from this through better ability to bring labour and machinery and distribution of products, local – and central – governments would also benefit from developing a full scale of economic activities and promoting the location as a production center, which will bring about more taxation and revenue for the government.

Intra-urban mobility has to be carefully planned for readjustments. While mobility and transport infrastructure needs to be upgraded to cope with the increased load, the social and environmental impacts of increased mobility have to be considered as well. This needs to include more communication with the local population and spread of traffic awareness, increase in traffic safety measures, as well as noise and pollution reduction measures. Enhanced mobility inside these settlements would also enhance the sense of being members of a larger body of population in the regional and national scales (Burfoot-Rochford and Schafft 2017).

5.3.1.2. Planning for Local Services

Another example would be the accentuation of the importance of local recruitment of staff and job creation. While this can be easy for low skill labour and tasks, investment should also be put in the creation of local training venues for the enhancement of the skill sets of members of the local population. However, this can be not feasible for investors in areas of petroleum extraction that have peaked in its production or which are not expected to have large reservoirs anyway as the development of labour skills is a long term process that is also costly, and the petroleum reservoir being prospected in the area may not be there by the maturation of this training. Also important is investments in healthcare. A capital intensive industry like petroleum extraction tends to spend more money on transferring workers or other employees subjected to occupational hazards to distant healthcare facilities than on the enhancement of the local healthcare facilities. While this is feasible when

the site is close to an urban settlement, where a standing population resides and is served in this field by permanent healthcare facilities to which the petroleum industry can share in enhancement, it would be extremely difficult and costly to provide anything beyond primary healthcare and emergency services in distant sites like those in desert area away from population centers or offshore facilities.

5.3.1.3. Planning for Demographics

Petroleum extraction is a gender-biased industry with more males than females working in it. In fact, part of the Boomtown effects is the upset of gender balances in these towns through the injection of large numbers of male workers. Developers should be cautious about this point especially in areas which are more inclined to be restrictive for women or in patriarchal societies. One way to deal with this problem is to increase the number of women hired in the petroleum industry. The World Petroleum Council in its 19th session (2006) recommended that petroleum companies should empower women in the industry. The African Development Bank recommended in a recent study the inclusion of women in the either technical or supplier roles in order to allow them access by the considerably higher income provided by the industry (2017). Another way of dealing with the problem of gender imbalance would be changing the pattern of residence of the migrant workers in the industry from labour camps into fully fledged living quarters which would allow those workers to bring their families and possible consider residing permanently in those settlements upon the condition of social and economic services provisions.

In some cases the development of petroleum fields take place in lands claimed by certain ethnic groups or communities. The most recent and publicised of these developments was the North Dakota Access pipeline through the Standing Rock reservation, which is part of the ancestral lands of the Sioux Indian Nation. The planned pipeline would cross in land that was allocated to the Sioux in a treaty between the Indian Nation and the United States Government in 1851. However, that part of the land was taken away from the Sioux and had been disputed ever since. When the plans for the pipeline were approved by the United States Army Engineers Corps, members of the Sioux filed a law suit in protest from potential damage to their ancestral land and sites (New York Times 2017). In some cases these projects could be a chance to incorporate those ethnic groups – or other underprivileged members of the community – in the larger context of the population and empower them economically and socially.

In the cases of Sekondi-Takoradi and Houston, it was evident that the larger percent of people moving to these cities were young people seeking better wages and living opportunities. The increased percent of young adults and adolescents needs special attention to their inclusion and protection against involvement in illegal activities. This should not be interpreted as a call for the creation of a patriarchal society where the older segments of the population control the younger segments, rather it is a call to consider the needs of these younger segments to better access to education, sports and

leisure facilities that would insure their involvement in constructive activities while figuring out their own way to contribute to the community.

5.3.1.4. Planning for Better Land Use and Environmental Concerns

Petroleum prospecting requires concessions for large areas of land which competes with other services required by the community. An example of such policies – that are not adequately utilised – are the rules dictated in petroleum concession agreements in Egypt which stipulates that petroleum prospectors have to relinquish concession lands when such lands are proven to of no use for the process of petroleum extraction. In case of concession areas in close proximity to urban settlements, such lands can prove valuable for the provision of service for the local communities, such as housing, education and healthcare. The activation of this clause goes both ways: prospectors and developers have to inform the respective authorities in the state petroleum sector of their land use plan and schedule, and on the other hand, those respective state authorities should actively pursue that information for those prospectors and developers. This will help in the creation of an efficient land data bank for each project, which would enable proper spatial planning for those areas.

On the other hand, measures has to be taken that would ensure safety of the environment, and prevention of environmental hazards that would cause health problems and other restrictions to the local population. An example of such scenarios is the distress offshore petroleum drilling cause to maritime and coastal environments. Oil spills have wreaked havoc on maritime and terrestrial environments alike, but in recent memory events like the disaster at Deep Water Horizon in the Gulf of Mexico stipulates the importance of maritime environment protection. Also, such events may cause damage to the coastal environment as well and inhibit recreational activities by the residents of the local population. Accordingly, the mitigation of such events should be enacted by dual action from both the developers and the government. The government should make sure that the developers are using optimal safety measures that would insure the prevention of such events and containment in case of occurrence. Also, the government should present the local population with alternatives in case of pollution of coastal environment, however the cost of such compensatory alternatives should be provided for by the party causing the predisposing events.

5.3.2. Executive Recommendations

Part of the purpose for this work, other than the general discussion of the Boomtown Syndrome, is to apply a possible remedy scenario on Ras Gharib. This will follow in the dimensions described as characteristic for the Boomtown Syndrome. It will take the form of executive steps to be performed by government. However, these steps should be taken as a replacement for a strategic master plan for the city, but rather as a collection of ideas upon which such master plan can be constructed, to be finally approved by the concerned stakeholders – mainly the people of Ras Gharib - through

appropriate participation measures. But it is worth mentioning that the forthcoming proposal will start by a description of an envisaged institutional and political framework that would govern the process, instead of ending up with one like in the previous chapters of this work.

5.3.2.1. Urban Development and Governance in Ras Gharib

Egypt is a centralised state where public expenditure and investments are governed by the annual national economic and social development plan. This plan is supposed to project the goal of further intermediate and long term plans are proposed by the government, represented in the Ministry of Planning. On the other hand, the execution of this plan is carried on by the various administrative units in Egypt. This planning and executive system favours domestic colonialism as it caters for the needs of the dense central core of the country and addresses the periphery as areas for exploitation and not development. The legal, institutional and political framework that led to the current situation of Ras Gharib needs to be overturned before any talk of redeveloping the city can hold water.

This means that the development of Ras Gharib has to be started at the hand of the people of Ras Gharib. And despite the fact that the master-planning provision in the current Building and Planning Law (No. 119/2008) necessitates public participation in planning, it has not taken place so far in spite of the presence of a provisional clause in the aforementioned law necessitating the finishing of such strategic plans in 2 years after the promulgation of the law.

Also, the local government apparatus itself has to be more democratic. Part of the required reform that would reverse domestic colonialism would be for the local residents to take in their hands the power of selecting their government. Parallel to the reformatting of government, a similar process for the petroleum sector is needed. Currently the government controls the process of giving concessions for petroleum prospecting. Currently GPC is the sole holder of the concession in the area immediately around Ras Gharib. Opening up the market for local service and logistics for local companies would boast the local economy and capitalise on the expertise gained by the local population in their petroleum careers.

5.3.2.2. Mobility

The city of Ras Gharib lies at the intersection between two important roads; the first one is the coastal highway running southwards for Suez all the way to the borders with Sudan and passes on important tourist destinations and all the major settlements in the Red Sea Governorate, the second is the road from Elsheikh Fadl in Elminia Governorate in Upper Egypt. Both roads had contributed to the population and commodity movements to and from Ras Gharib. Also, the city is home to a seaport that is operated by the petroleum sector and used only for loading offshore petroleum.

This can be used to create multiple economic opportunities based on transportation. An extension of the Ras Gharib to Shiekh Fadl road is planned to go across the Nile River in a northwest direction all the way to the Mediterranean coast (GOPP 2014). A passenger and cargo terminal can be added to the port for a ferry service to the opposite side of the Gulf of Suez in El Tor, the capital of South Sinai Governorate, and making Ras Gharib the hub of a transverse road, linking Sinai, the Red Sea Coast, North Upper Egypt, West Delta, and the Mediterranean Coast. In that scenario, a dry port can be established at Ras Gharib for goods coming from Upper Egypt for instance and going to Sinai. The coastal highway is serving passengers traveling for leisure destination to the south. However, there are no roadside rest stops in that segment of the road between Ain Alsokhna to the north and Hurghada to the south except in Zaafarana, 100 kilometers north of Ras Gharib. This can also be a good location for the establishment of transport logistics services, like car and coach maintenance services, which can tap into the mechanical expertise pool present in Ras Gharib from work in the petroleum sector.

5.2.2.4. The Service Sector

The city of Ras Gharib lacks many services both in essentials and in leisure. Residents have to travel to faraway destinations to get their basic needs to the extent that some have opted to leaving the city altogether (Personal Interview 2016). This opens multiple opportunities in the service sector for investors. Also, the development of healthcare services in particular is important as the city's capacity of hospital beds is way below national average (CAMPMAS 2017), and the new hospital is yet to be finished. Also there is the problem of food supplies as the city imports almost all its food. Investment in the nearby village of Wadi Dara, which is a budding agricultural development depending on groundwater, can help alleviate the condition.

A major setback for any efforts for development in the area is the water shortage and dependence on a supply line from the Nile River that requires several pump stations along its course, making its operation costly and unreliable. Establishing desalination plants will partially solve this problem.

The same goes for leisure, recreation, and every other aspect of the service economy, in addition to multiple investment opportunities in tourism and mining and quarrying sectors. This in turn will generate more jobs and help retain population.

5.2.2.5. Demographics

Due to the nature of administrative housing in Ras Gharib where GPC provided family housing, the ratio between males and females living in the city is within the national average (CAPMAS 2017). Women may not be frequently hired due to the perceived masculinity of the jobs in the field but in Ras Gharib they have access to employment in other sectors – within national norms. A part of the new hospital will be dedicated to the establishment of an attached nursing institute for girls.

More attention has to be paid to the younger segments of the community, where they should be guided towards other economic activities and start perceiving life outside the petroleum sector. A culture of entrepreneurship has to be invested in the young people in order to enact the required positive change needed for the survival of their city.

Finally, the development of the informal area in the northern part of the city will help bring an end to the stigma casted upon the residents of that area as delinquents and drug traffickers (Personal Interview 2016).

5.3.3. Last words: Academic Recommendations

This study is relevant to boomtowns that were built around extractive industries like mining and petroleum extraction; i.e., industries at the start of the value chain. Applying the rules developed here to other industries will require considering other inputs and outputs with their entire chains.

Geographically speaking, the study can be expanded to include entire clusters of cities or regions where development takes place in separate without linking to surrounding environment which can affect its longevity. An example of such region is the Red Sea coast of Egypt, where the cities of the coast each specialised in an economic activity without linking with the other cities. This is primarily due to the centralised planning, and studies in coordinated planning and metropolitan regions may prove beneficial in remedying the Boomtown Syndrome.

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