

Chapter 31

Megaproject: A 4-Decade Perspective of the Gulf Development Model

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31.1 Introduction

Since the global oil shock of the early 1970s, the Arab Gulf States have stimulated economic growth through infrastructure-led development in the form of distinct megaprojects. Initially, this was basic infrastructure in order to facilitate and expand oil production. Multinational companies (MNCs) in construction, engineering and oil and their labor provided the skill and technology for this infrastructural development.

As we fast-forward 35 years and witness the exceptional urban development of Abu Dhabi, Dubai and their counterparts in the Gulf, it is often forgotten that these new development projects represent varieties of a four-decade old development continuum in the Gulf: the deployment of oil windfalls into megaprojects to promote rapid economic growth. Building on the most successful diversification megaprojects of the late 1970s, the Gulf countries continue to invest in megaprojects to transition beyond oil, representing two key post-oil trajectories: first, *resource-based industrialization*, to include petrochemicals, plastics and aluminum; second, *services and knowledge activities*, in trade and entrepôt, information technology, tourism and education.

This paper examines each of these trajectories through detailed analyses of how two countries have utilized megaprojects to leap into post-oil economic development. In particular, we examine the evolution of two megaprojects, from their creation in the 1970s to their most recent transformations with the advent of the current oil boom. Jubail and Yanbu, the Kingdom of Saudi Arabia's twin industrial cities, represented the largest industrial cities in the world at the time of their conception, and provided the basis for the country's current construction of seven huge *economic cities*. Dubai's Jebel Ali port, also constructed in the mid-1970s, is the largest human-made harbor in the world and is the model for the United Arab

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Emirates' (UAE) spectacular economic diversification program today as well as a model for projects across the Gulf.

These two diversification trajectories are conceptualized through this megaproject framework with three objectives: first, to assess the complements and constraints of oil-based development legacies on the transition beyond oil; second, to identify the "construction" of new entrepôt, service, tourism and knowledge nodes in the world economy; and, third, to determine the effects of continued reliance on foreign skill, labor and technology from MNCs to promote and sustain local development.

31.2 Megaprojects: Theory, Rationale, Evaluation

Megaprojects can be categorized into four groups (Gellert & Lynch, 2003): *physical infrastructure, natural resource extraction, production, and consumption*. In the Gulf, we see all four of these categories of projects, and often within entirely new cities. This includes the products of oil urbanization, such as the modern capital cities of the region, but also in the form of post-oil cities, such as Dubai's enclaves and Saudi Arabia's economic cities as will be discussed below. Megaprojects in the Arab Gulf are the physical manifestations of oil windfalls. The infrastructure *itself* has a global reach and a local impact, with pronounced human geographic outcomes. These include changes in the map of foreign investment and multinational corporations' behavior, the stimulation and direction of skilled and unskilled labor migration flows, and the formation of world cities. Accordingly, examining the impacts and outcomes of Gulf megaprojects offers a great deal to our theoretic understanding of the geographic implications for such projects.

But what is the rationale in the developing world to utilize megaprojects to achieve higher levels of economic development? The literature on this topic dates back to the "Big Push" theory developed by Hirschman (1958) and Myrdal (1959) and, before this, Innis' (1933) work on the "staple trap." Big push theories argue that the investment of large portions of revenue into a few, key, large-scale physical infrastructure projects generates a process of cumulative causation. Developing economies often have weak private sectors. If the government takes the risk to create physical infrastructure which could be shared by corporations, private capital formation will necessarily follow: private capital formation leads to industrial capacity which then leads to "development" (Amsden, 2001; Looney, 1989; Sachs & Warner, 1999; Scott, 2002). The basis of this theory is that physical infrastructure can change and stimulate the relationship between supply and demand, by reducing transaction costs and creating linkages, substituting capital and labor, and diversifying employment and consumption opportunities.

In a number of cases, these projects have failed to meet expectations, instead becoming symbols of wasteful spending, corruption, or population displacement (Gellert & Lynch, 2003; Gunton, 2003). Accordingly, the World Bank recognizes that there are a number of conditions which need to be met in order for such projects

to generate a positive impact (Kessides, 1993). First, there must be an efficient strategy for which projects should be undertaken, where they should be located and how they should be allocated so as not to have a crowding out effect on existing production activities. Second, infrastructure cannot create new potential, but can complement and enhance existing productive capacity. Lastly, users must be willing to pay to use the infrastructure.

In geography, Scott (2002) has adapted the “big push” by adding notions of space and place, developing the idea of a “regional push.” He discusses how infrastructural investments can create localization and urbanization economies. Localization economies are defined by the efficiency gains which occur due to the agglomeration of firms from a specific sector in a given region. Urbanization economies are defined by efficiency gains from the agglomeration of firms from many sectors in a given region. The common basis to both ideas is that the clustering of firms accrues positive externalities to the place where the clustering occurs. In Scott’s argument, agglomeration reduces transaction costs, stimulates the local labor market, creates a competitive advantage for the region in a given specialty, and produces economies of scale (Scott, 2002). Scott, however, recognizes that processes of cumulative causation are heavily influenced by path-dependent, evolutionary patterns of growth in a given region, at times preventing such strategies from producing the desired outcome. Indeed, path dependence and regional lock-in provide an important explanation for why the Gulf region has failed to transition beyond oil. Despite undertaking the largest megaprojects for economic growth in the world, the legacies of oil have prevented the region from diversifying into new sources of growth.

31.3 Megaprojects, Diversification and Development in the Gulf

In the Gulf, we see big push and regional push strategies used as an impetus for economic growth and development. From the early days of Aramco, to the oil urbanization of the 1960s and 1970s, to the transformation of Dubai into a global city, urban-industrial megaprojects have represented key strategies for economic growth and development (Lawless & Seccombe, 1993; Melamid, 1980; Pacione, 2005; Sell, 2008). While the Arab Gulf States today are beacons of modern infrastructure, this growth is the reflection of oil rent distribution-based economies.

With the 1973 oil embargo, windfalls were primarily directed to expanding government bureaucracies as a means of both creating an apparatus to control and expand oil production and as a way to distribute profits to the local populace in the form of government employment and massive social entitlement expenditures. Until the late-1970s, strategies were primarily based on big push ideas: massive investments in massive physical and productive infrastructural projects designed to increase absorptive capacity for oil production, modernize the economies, and increase standards of living as rapidly as possible (Auty, 1988; Fasano & Goyal, 2004). Even with such large social and physical infrastructural expenditures, due

to the small native populations, it was impossible to absorb all of the oil windfalls locally. As a result, large sums of money were directed to foreign equity markets, especially in the US and Europe, and transferred abroad through remittances to foreign labor. The result was rapid economic growth, but this came at a cost (Auty, 1995; Richards & Waterbury, 1990).

Today, the region's overall economic structure remains heavily dominated by oil, massive bureaucracies and, most significantly, foreign labor. In regards to the latter, population dynamics represent both a rationale for, and an impetus to, diversification in the region. The Gulf States have the highest population growth rates in the world, growing from 4 million in 1950 to 10 million in 1975 to 36 million in 2005 (World Bank, 2008). In 2005 the workforces across all six Gulf States were comprised of an average 70% expatriate labor. Qatar and the UAE have the highest percentage of expatriates in the workforce at 90% (GIC, 2006).

The first oil boom (1973–1986) witnessed two key types of megaprojects for diversification which have remained the models today. The first of these, resource-based industrialization, represents a sensible strategy for an oil-rich and labor-deficient economy. Petrochemical, plastic and aluminum complexes are capital- and resource-intensive, but require few workers (Auty, 1988). Prominent early examples of these include Jubail and Yanbu in Saudi Arabia (1975), Saudi Arabia Basic Industries Corporation (1977), Dubai Aluminum (1975), and Bahrain Aluminum and Steel (1985). The second includes service, and more recently, knowledge-based activities. Prominent early examples include Bahrain as an offshore banking center (1975), and Dubai's Jebel Ali Port (1975) and Free Zone (1985) (Fasano, 2003).

Despite these exceptional successes, key megaprojects had not altered more fundamental distortions in the region's economies, that is, distortions resulting from the rapid, oil-based development of the 1970s. Resulting social, demographic and economic distortions left the countries in dire straits as budgets had to be tightened in the 1980s. The entire economic structure of the economies had been designed for oil, with weak private sectors and heavy foreign capital and labor dependence. With the fastest-growing populations in the world, expectations for the distribution of oil rent had not changed (Keller & Nabli, 2002; Looney, 1994). Despite the seemingly urgent need for the region to transform its economies during this period, government expenditures were increasingly directed towards a different type of megaproject, viz., military infrastructure. This continued through the period of the Iran-Iraq war and Gulf War (Henry & Springborg, 2001).

In the mid-1990s, as the oil market began to look more optimistic, the use of megaprojects for diversification reemerges with adaptations and new interpretations of the 1970s earlier megaproject successes to meet a new economy. With these new windfalls, the region has invested in variations on the most successful of the 1970s resource-based industrialization and service and knowledge-based megaprojects, all adapted for a 21st century global economy. These exceptional examples have provided a model for how to spend post-1998 windfalls in the region. Each of these strategies shares the same objective: provide a future after oil by diversifying the economic base and thus ending reliance on foreign workers, skill and technology and creating locally sustainable economic growth.

Each of the new resource and service/knowledge-based approaches of constructing megaprojects for diversification is largely based on a contained form of economic liberalization (Auty, R. M. (2007) "Personal communication", June 14). They are designed to not jeopardize the power of the region's monarchies or their control over oil reserves and production. In each of these cases, the government provides land, infrastructure and subsidies to foreign corporations. Such strategies more closely follow Scott's regional push theory than the neoclassical big push arguments, as witnessed in the proliferation of special economic zones, sector-specific industrial, service and knowledge cities, and cluster-based development strategies (Christiansen & Bohmer, 2005; Horovitz & Ohlsson, 2005; Tahir, 1998; UNESCWA, 2005).

31.4 The Case of Saudi Arabia: From Jubail and Yanbu to the 7 Economic Cities

In 1982 *Time Magazine* proclaimed, "In all the expansive sweep of civil engineering, from the pyramids to the Nile to the construction of the Panama Canal, nothing so huge, or costly, as Jubail has ever been attempted by anyone" (Taylor & Blaylock, 1982: 1). The origin of the concept of these industrial cities, although disputed, is often attributed to Steve Bechtel Jr. of the US firm Bechtel Engineering. According to an observer, he envisioned "two industrial cities, on the East and West Coast, tied by a pipeline," which would act as "two industrial lungs for the country, with an artery in between" (Pampanini, 1997: 13). The government would provide the capital for the construction and development of the project, using state intervention to attract foreign investors while also providing incentives to local industries. While Bechtel built the project, Shell and Mobil Oil were the two key partners (Auty, 1990).

Initially the site of small fishing villages, each with populations under 20,000, Saudi Arabia established a Royal Commission to build the cities in 1975. The cities spearheaded a three-part diversification strategy embarked on by the Kingdom in the late 1970s and early 1980s: "to add value to human and material resources . . . to provide the basic linkages backwards to the raw material sector and forward to a wide variety of potential resources" (Ghanem, 1992: 85). The cities were also designed to take pressure away from the rapidly growing key cities of Riyadh and Jeddah. The projects were designed around the build-operate-transfer logic: pay foreign firms to build and initially operate the project and then train local firms and labor to take over (Auty 1990). The Royal Commission designed each city to be comprised of basic industries, secondary industries, and supporting and light industries (RCJY, 1991).

While industrial, population and employment projections were consistently downgraded into the mid-1990s (Auty, 1990), the second oil boom gave new life to the cities. Population in each city grew from under 20,000 in 1975 to approximately 100,000 in 2008, 9% of which has been in the last decade. In Jubail, the population

reaches 140,000 during the day as the majority of the workers remain commuters rather than residents of the city (Martin, 2008a; Pampanini, 1997). Today, Jubail is responsible for 50% of its country's entire foreign investment and 70% of its non-oil exports. Jubail alone is responsible for 7% of the entire world's petrochemical production (EIU, 2006). Jubail was even named as the "Middle East city with the best economic potential" by *The Financial Times* FDI Magazine (Hanware, 2005). Most recently, the construction of Jubail II has begun, with Jubail III now on track for construction as well. The plan is to double the industrial site at a total budget of US \$45 billion and the expectation of creating 380,000 jobs. Jubail and Yanbu are each to receive two US \$6 billion dollar refineries as part of 82 total projects planned by the Royal Commission in the future (BMI, 2008; Martin, 2008a).

The economic success of the cities, however, has not sufficiently addressed the population and employment challenges which face the Kingdom. Indeed, the measure by which we evaluate the success of megaprojects in the Gulf requires a different set of metrics than would be applied in the West. Most importantly, the cities' overall impact on the Kingdom's total employment picture is marginal, having generated a combined total of 90,000 jobs (RCJY, 2008a). This total job creation figure must be interpreted in the context of a country with a total population of 23 million people, comprised of 4.8 million foreign workers and only 1.3 million Saudi workers (GIC, 2006). The largest demographic success of the cities is that its local population is growing at a significantly faster rate than its foreign population. Yanbu, for instance, experienced a 125% increase in the Saudi population since 1990, but only a 32% increase in the expatriate population (Kutubkhanah, 2008).

Indeed, the capital-intensive nature of RBI plants precludes any significant impact on the larger conundrum of large numbers of foreign labor, and young, fast-growing local populations with high unemployment rates. The country had a 4.1% annual population growth rate from 1960–2000 and over 43% of the 2000 population was under 15 years of age (Rodenbeck, 2002). Even in Jubail, approximately 37% of the population is under 15 years of age and 70% under 30 years of age (RCJY, 2008b). Official unemployment estimates for the country sit at 12%, but some believe that the actual numbers could be double this figure (King, 2007).

In regards to employment distribution, public sector, non-industrial employment continues to make up a disproportionate percentage of total employment in the cities. Just under half of all jobs remain to be in non-industrial government and social service jobs (RCJY, 2008a). It is also probable that, as in the rest of the Kingdom, the majority of the public sector jobs are held by Saudi labor while the foreigners hold a disproportionate share of the private sector positions.

The economic success of Jubail and Yanbu and the larger proportion of Saudi to foreign population (though not labor) in the cities have provided a model for the Kingdom's largest, costliest and most ambitious projects yet: the seven economic cities. The new economic cities reflect Saudi Arabia's aspired economic trajectories some 30 years later – the evolution of the Jubail/Yanbu model to tackle new challenges and create new opportunities for economic diversification. The objectives of the cities are to "promote balanced regional development, achieve economic diversification, create jobs and upgrade competitiveness" (SAGIA, 2008a). The goal is

to generate over one million jobs, produce between a quarter and a third of the projected GDP growth, be home to over 4 million residents, and become one of the top ten global investment destinations, all by 2020 (SAGIA, 2008a; SUSRIS, 2007).

Construction on four cities has begun and plans for three more have been announced; with a total anticipated cost of half a trillion US dollars (Martins, Lewin, & Phillips, 2008). Key facts on the cities are summarized in Table 31.1. While China used its abundant resources of inexpensive labor to become a global industrial superpower, Saudi Arabia is leveraging its own most abundant resource, oil, to become an industrial superpower in its own right (King, 2007).

Three key factors both characterize the economic cities as an effort to replicate Jubail/Yanbu model for the 21st century, and reflect efforts by the Saudis to attain something different entirely. Firstly, the new economic cities are designed to be entirely self-contained, with a philosophy of “live, work and play” (Mansi, 2008). Jubail and Yanbu were designed to prioritize the industrial area (Al-But’hie & Eben Saleh, 2002). By contrast, even though each economic city will have a clear sectoral focus, each will also include real estate, education, a port and tourism development (Martins et al., 2008; SUSRIS, 2007). Their goal is to create contained zones of competitiveness which can articulate the national economy onto a global stage. One of the main problems plaguing the Kingdom remains regional inequality (Abdel Rahman, Al-Muraikhi, & Al-Khedheiri, 1995). By building the cities in remote areas of the country, planners hope that the new economic cities will address this problem (Martins et al., 2008).

The second factor characterizing the new economic cities is that of the public/private sector dynamic. Jubail and Yanbu were entirely financed by the national government, which also owns the land and provided subsidies to foreign investors (Martin, 2008b). In the new cities, the private sector is intended to provide the capital, as well as to own and develop the land. Additionally, the Saudi Investment Authority will act as a facilitator and regulator, rather than a provider and financier (Al Mansour, 2007). While this strategy is in line with the neoclassical development model, some believe that the Jubail/Yanbu model was a better strategy in a region with such high levels of political and economic risk: “the biggest lesson to learn from Jubail and Yanbu: that the private sector will be involved in projects that get state financial support” (Martin, 2008b: 46).

The last factor characterizing these cities is a set of sectoral specializations, chosen by McKinsey, the US consulting firm (Mansi, 2008). The cities are being built around three sectors: energy, transportation and knowledge, intended to “act as an anchor and growth engine for the city, around which other businesses will locate” (Al Mansour, 2007: 5). In regards to energy, the goal is much the same as Jubail and Yanbu: to focus on resource-based and energy-intensive industries which add value to Saudi oil resources, as well as stimulate the growth of upstream and downstream industries (SAGIA, 2008b). The second specialization, transportation, was chosen to exploit the key location of Saudi Arabia as a link between Asia and Europe/North America (SAGIA, 2008c). Achieving diversification through promoting linkages between minerals and transportation sectors has represented a key strategy since the 1970s, and is epitomized by the Jubail/Yanbu projects (Aldagheiri & Bradshaw,

Table 31.1 The Saudi economic cities

Name	Region	Size in Mn sq meters	Cost Est. in US \$ billion	Population/ Employment Estimates	Components	Industrial activity
Jizan Economic City	Jizan	100	30	500,000/250,000	Industrial park, agriculture export and distribution, business and cultural center, port, fisheries, health and education areas	Energy- and labor-intensive industries
King Abdullah Economic City	Mecca	168	27bn	2,000,000/1,000,000	Port, financial island, resorts, industrial district, education zone, residential area	Transport and logistics, light industry, services
Medina Knowledge City	Medina	4.8	25	50,000/20,000	Islamic education theme park, health and biotechnology center, high tech park, Islamic civilization research center, multimodal transport center, business, retail and hotel districts.	Knowledge and technology (IT and communication)
Prince Abdulaziz Bin Mosaed Economic City	Hail	150	30	300,000/55,000	Logistics and transport, petrochemical, agribusiness, mining and business centers, international airport, dry port and entertainment zone	Transportation and logistics, agribusiness, minerals and construction

Sources: Al Mansour (2007); Martins et al. (2008); SAGIA (2008a); SUSRIS (2007)

Recently announced: Ras Al-Zour Resource City in the Eastern Province, focusing on energy and minerals, Sudair Industrial City in Qassim, focusing on telecommunications and electronics, and Tabuk Economic City in Tabuk, whose specialization has not been announced

2006a, 2006b). Knowledge based industries, the last of the three specializations, includes education, healthcare and medical research, and technology. King Abdullah Economic City, for instance, includes the King Abdullah University of Science and Technology, which already possesses a \$25 billion endowment (Mansi, 2008).

31.5 The Case of UAE: From Jebel Ali to Nodes of Competitiveness

In 1981 the UAE federal government published a five-year plan based on the following key principles: First, the projects were to be capital-intensive and not labor-intensive, export-oriented and hydrocarbon-based, as well as regionally balanced across the seven Emirates. Second, the public sector was to finance the construction, design and operation of the projects, to provide subsidies to foreign and local investors, and to create incentives for industrial expansion. Third, projects were to be based on the use of foreign firms as investors or joint ventures in order to promote technology transfer and connection to foreign markets (Ghanem, 1992).

The Emirate of Dubai was well ahead of the federal government's plan, having begun construction of Jebel Ali, the world's largest human-made port, some six years earlier. Dubai, a regional trade hub since a century prior had already decided to use oil windfalls to reclaim this position. Because the initial foreign construction labor required for Jebel Ali would dwarf the entire population of the Emirate in the mid-1970s, leaders decided to place the port 35 km (22 mi) southwest of the city. In retrospect, building such a massive structure away from the city center was an excellent decision from a planning perspective, but the rationale at that time had more to do with fear over the impact of foreign laborers (Birks & Sinclair, 1980). The initial intention was to use Jebel Ali as a zone to transform the economy, first reclaiming the Emirate's regional trade status and then to create production-based industrialization in the fields of aluminum, gas and cables. From this perspective, the Jebel Ali project would seem to have a great deal in common with Jubail and Yanbu. The Emirate had more innovative plans, transforming the port into Jebel Ali Free Zone in 1985 (Ghanem, 2001).

Jebel Ali came to offer foreign companies an appealing base from which to create a regional hub for the Gulf States and South Asia. Location has been a key factor in Jebel Ali and Dubai's success over the past four decades (Capineri & Randelli, 2007). In number of days at sea, Jebel Ali is 14 days from Europe, 20 days from the Far East, 9 days from Southeast Asia, 35 days from the US East Coast, 10 days from India and Pakistan, and 45 days from South America (JAFZ, 2007). More significant in a region of such high political and economic risk, Dubai has proven over the last three decades that it offers an environment which is largely immune from the military and political strife afflicting its neighbors. If anything, Dubai has benefited from its neighbors' problems, including benefits from providing bases to US military operations, a regional entrance for US goods in the region and a doorway to the Iranian market (Davidson, 2007). Jebel Ali also offered such incentives as

complete foreign ownership, access to land with long-term leases or comparatively low rental rates, freedom from all tax, custom and levy charges, and no employment restrictions (Christiansen & Bohmer, 2005). While Gulf economies already have low taxes, the region's governments are quite sensitive to issues of foreign control and ownership. By creating a contained space from which to get around this, Jebel Ali gave foreign investors exactly what they wanted.

In 1985, at the Free Zone's conception, there were 19 total firms, nearly all in the trade sector with US \$50 million invested. In 1990, the number had grown to 276 with US \$600 million invested (Ghanem, 1992, 2001). By 2006 the port had 6000 companies from nearly 100 countries in residence with approximately US \$5 billion invested (JAFZ, 2007). Soon after the success of the JAFZ idea was realized, the UAE adapted its entire diversification program to be based on the idea of free zones, creating almost two dozen other free zones, with many others under construction. Rather than only creating new trade-based zones to reinforce its status as a regional hub, zones established since the second oil boom have been designed to act as "centers of innovation" in a variety of service and knowledge-based sectors (Christiansen & Bohmer, 2005; Ferretti & Parmentola, 2007; Horowitz & Ohlsson, 2005). Some of the most significant projects in Dubai are summarized in Table 31.2.

Largely as a result of the success of Jebel Ali, the majority of Dubai's current GDP is now based on non-oil activities, and 10% of non-oil GDP is from foreign direct investment. Perhaps the greatest success of Jebel Ali is that its home company, Dubai Ports World, now operates ports around the world and is hired by other countries to create ports and free zones. The company has 50,000 employees in over 100 cities around the world and 53 terminals in 30 countries. JAFZA itself is part of Dubai World. Currently under construction is Jebel Ali International Airport, poised to be the largest airport in the world. According to the JAFZ port authority the airport will distinguish JAFZA as the "only logistics hub in the world to be located within the same customs-bound complex as a major port and airport, resulting in even quicker sea to air transshipments" (JAFZ, 2007).

Jebel Ali is not without competition, as the entire region has followed suit with the special economic zone strategy. This could prove problematic for Jebel Ali's dominance in the region. While today many firms will happily make the long trip into the Straits of Hormuz and up the Persian Gulf to access the region at Jebel Ali's state-of-the-art port, new ports are being established in much more convenient locations. These include Saudi Arabia's new economic cities, but also ports in Oman and even the Northern Emirates of the UAE which do not require ships to travel into the Persian Gulf to access the region. Even more interesting is the construction of Saudi Arabia's new US \$5 billion landbridge railway designed to link the Red Sea and Persian Gulf coasts of Saudi Arabia. According to an engineer with Hyder Consulting, a firm working on the project, "It makes sense from almost every angle for Saudi Arabia to be the region's hub. If you look at the way the shipping lanes are laid out, Dubai is quite painful to get to, whereas if you drop goods in Jeddah, you have regional distribution . . . and only have to pay a single set of port duties" (Tomlinson, 2007: 24).

Table 31.2 Key special economic zones in operation or under construction in Dubai

Name	Zone Type	Est.	Sq Km	Economic activities
Jebel Ali	Free	1985	100	Trade, processing, manufacturing, packaging and assembly, storage
Dubai Airport	Free	1996	12	Manufacturing, processing, assembly activities, trade activities, selected services
Dubai Internet City	Industry	2000	4	IT Support, Software development, Web-based marketing
Dubai Customs and Automobile Free Zone	Industry	2000	8	Automobile trading
Dubai Media City	Industry	2001	0.3	Broadcasting, production, advertising, public relations, music, publishing, marketing, consultancy
Dubai Metals and Commodities Center	Industry	2002	2	Gold, diamond and commodities trading
Dubai Technology Park	Industry	2003	3	Advanced Engineering (material science), Agro-Food, Biotech (pharmaceuticals), Environment (desalination), oil
Knowledge Village	Industry	2003		Education, training, research and development
Dubai Healthcare City	Industry	2003	2.1	Healthcare
Dubai Industrial City	Industry	2004	52	Machinery and Mechanical equipment, Base Metals, Chemicals, Food, Beverage and Mineral Products
Dubai Int'l Financial Center	Industry	2004	.44	Banking; Capital Markets; Asset Management and Fund Registration; Insurance and Re-insurance; Islamic Finance
DuBiotech	Industry	2006	2.3	Agro-Food, Biotech, Environment, Health Care, R&D
Dubai Silicon Oasis	Industry	2007	7	Information technology, electronic innovation, R&D

Sources: Christiansen and Bohmer (2005); Tahir (1998); UAE Free Zones (2008); UNIDO (2008)

The current proliferation of megaprojects in Dubai represents the evolution of the Jebel Ali model to create nodes of economic competitiveness in other economic activities as well. The cities of the Arab Gulf, particularly Dubai, have made strong efforts to attain global city status by taking advantage of “global spectacle,” that is, constructing spectacular infrastructural projects and promoting megaevents that gain global media attention and attract foreign investors, corporations, workers and tourists (Short, 2004). Dubai has gained so much attention in the media over the last decade because its projects are always the first, costliest or largest of their kind.

Little work, however, has addressed the rationale or sustainability of such projects. Global spectacle in the Gulf is closely related to the dependence on migrant labor and the polarization of wealth in the Gulf. In order to build, and then to provide the heavy service requirements of the attractions, hotels, restaurants and events, a city requires even more expatriate labor. In order to host and promote events or build global tourist attractions in the first place, the city also needs the super-rich. The Gulf has both of these requirements (Malecki & Ewers, 2007).

The success of Jebel Ali and Dubai's other special economic zone megaprojects, in particular, can be deceptive. Most importantly, this strategy to generate service and knowledge-based development through megaprojects is based on creating hubs for multinational corporations, with no requirements for hiring and training local, Emirati labor. From the 1970s to today, the country has only increased in its total number of foreign labor, which today represents over 90% of the total labor force (GIC, 2006). The vast majority of the companies in Jebel Ali, for instance, are foreign companies. Without local hiring requirements, most of the professional workers in Jebel Ali and other UAE special economic zones continue to originate from the US, Western Europe and Asia rather than from the UAE (Tahir, 1998). Accordingly, while this strategy has clearly generated significant economic growth and has placed the UAE well on track to leaping beyond oil and into service and knowledge-based growth, the sustainability of such a strategy remains in question.

31.6 Conclusions

First, and inspired by the Jubail/Yanbu success stories in Saudi Arabia, the region has increasingly invested in downstream, resource-based industrialization projects. Petrochemical, resource-based industrialization complexes were the most common megaprojects for diversification to be implemented during the first oil boom. The logic behind this move in the region is to take advantage of cheap oil inputs and large capital stocks to build non-labor intensive industries. Such projects relied heavily on oil as an input and did not protect the region's economies from the volatility of global commodity markets. As oil prices declined, so did the prices of petrochemicals, thus questioning the rationale for oil-based industrialization a sensible post-oil strategy (Auty, 1988).

There are a number of challenges for the new cities. First and foremost is the area in which Jubail and Yanbu's success has not been sufficient: job creation. A large proportion of the industrial focus of these cities remains energy intensive industries, questioning the truly post-oil nature of such a strategy of economic diversification. Such industries create few jobs. For instance, one of the ten massive aluminum smelters being planned as part of the economic city initiative would, in total, absorb 7% of total annual oil production, but only produce 100,000 jobs (King, 2007). In non-oil sectors, such as transportation and knowledge-related activities, subsidies intended to boost local capacity will also keep wages artificially high and prices artificially low (Sell, 2008).

Second, and inspired jointly by the successes of Dubai's Jebel Ali Port and Bahrain's offshore banking center, the region's countries have engaged in an increasing number of service and knowledge-based development strategies (Keivani, Parsa, & Younis, 2003; Pacione, 2005). As it currently stands, however, despite creating the world's largest megaengineering projects for the purpose of diversification, the region remains dependent on foreign labor for the operation of these projects.

Each of these two types of diversification strategies is potentially perpetuating the region's problematic reliance on foreign labor, which could hinder the creation of an employed, skilled, native workforce. Just as foreign companies and their workers were imported to fill skill gaps and increase absorptive capacity during the first oil boom, the same is occurring in non-oil sectors during the second oil boom to fuel agglomeration economies. Additionally, in order for the megaproject model to represent a viable development alternative for the other Gulf countries, strategies to attract international human capital must be accompanied by the creation of indigenous human capital. Failure in this would be the rent-distribution economy in a new guise: continued dependence on skilled foreign labor, with oil and property rents being used to subsidize a dynamic market economy through service and knowledge activities that will not be competitive, but rather, a product of rent-fueled incentives (Auty, R. M. (2007). "Personal communication", June 14).

Addendum (December 2008)

In July of 2008, before the collapse of the financial sector in the U.S., world crude oil prices reached a record US \$145 per barrel. According to popular and political discourse in the U.S. during this time, oil prices could go nowhere but up. This was also the consensus in the Arab Gulf States, where the building boom was in high gear and record budget surpluses were being announced. Less than five months later, however, in December of 2008, oil prices plummeted to under U.S. \$39 per barrel. Gulf development expenditures had been based on oil staying at least U.S. \$50 per barrel for the foreseeable future (*The Economist*, 2008). Instead of being awash in petrodollars, and announcing the latest, biggest megaproject yet, budget deficits are currently projected for at least Bahrain, Oman and Saudi Arabia for 2009 (Merzaban, 2008). Development strategies during the post-1998 oil boom had also relied on private sector investment more than during the previous oil boom. These investors have begun to retreat for safer ground since the credit collapse. While there is little doubt that oil prices will rise again, the "post-1998 oil boom" has now become the "1998–2008 oil boom." Indeed, the largest of the region's building and development projects, most of which are multi-year undertakings, now sit in jeopardy of being completed. The impact of the credit collapse and oil bust in the Gulf could have a disastrous aftermath, both inside and outside of the region.

Local and foreign investors in the region are feeling the most immediate impact of the global economic crisis. Global construction firms have flocked to the Gulf during the past decade's oil boom to build the megaprojects and banks have flocked

to finance the projects. Real estate speculators have followed suit. In June of 2006, the total value of construction projects for the six Gulf countries combined was just under \$400 US billion. In June of 2008, the total value had risen to almost \$2 US trillion (MEED, 2008a). Over the past decade the Gulf has become the primary source of global construction revenue. All parties involved in these projects have a great deal to lose, as described by a senior Dubai official in December, 2008:

It's a tragedy in the making . . . A lot of people are going to get hurt. A lot of dreams are going to be shattered . . . Have you seen all those ships lined up on the horizon? They're stuck out there full of steel and concrete nobody wants anymore.

(Dickey, Salama, & Summers, 2008: 44)

While the region has created a number of its own multinational construction firms, most construction companies operating in the region are of North American, Western European and East Asian origin. The activities of these companies represent important components of their respective home countries' national revenues. The potential loss of profits from delayed or cancelled projects could add to the financial woes these countries are currently experiencing. More locally, a significant amount of construction activity in the region has been intended to accommodate higher skilled, higher net-worth expatriates. A decline in demand for luxury expatriate accommodation will only exacerbate the local impact of the global economic crisis.

The most severe impacts could be felt across the Persian Gulf in the Indian Subcontinent. The largest contractors in Dubai employ as many as 40,000 workers, and as construction activity slows, many workers will be sent back to their home country (MEED, 2008b). As one analyst (Seale, 2008: 1) asks, "What will happen to these workers if many real estate and construction projects are delayed or even cancelled? What will be the impact on the economies of the sub-continent if hundreds of thousands of these immigrant workers head back. . .?" To be sure, the South Asian economies have felt the credit collapse as much as the rest of the world. Unlike Europe and the U.S., however, these economies are dependent on remittances from vast numbers of their citizens working in the Gulf, primarily in the oil and construction industries. According to World Bank remittance tracking, migrant cash transfers to the developing world are expected to decline in 2009 after several years of double-digit growth (Tavernise, 2008). In 1991, after the (first) Gulf War, Kuwait expelled nearly half a million Palestinian workers from their country in short order. It would not be unreasonable to expect an even larger expulsion of millions of low-skilled South Asian workers in the Gulf region.

Gulf citizens, the intended beneficiaries of the regions' massive development projects, have the most to potentially lose in the long term. The disjuncture between the stated objectives and real outcomes of using megaprojects for development in the Gulf has represented an important theme in this chapter. Since the 1970s oil boom, the region's leaders have rationalized the extravagance of Gulf megaprojects to their citizenry as social and economic investments for present and future generations. The presence of foreign companies and labor is justified in Gulf political

discourse as a necessary and temporary evil required for jump-starting local capacity in non-oil industries. Upon completion, the projects are promised to provide jobs to the local populace and a future beyond oil for the country. Based on our ongoing fieldwork in the UAE, it appears that the region's governments may have lost sight of this end-goal as investors tasted, for the first time, the extraordinary profit potential of real estate development and speculation. Indeed, the Gulf States did not waste time in attempting to duplicate Dubai's initial success in the late-1990s, competing with each other to build more and more massive property, tourism, commercial and industrial projects. While the region has made record investments in building new universities in the last decade, university construction has come to represent just another Gulf megaproject. Time will tell whether these investments in physical capital have been accompanied by the human capital investments required to sustain the economies after the construction projects are completed. As oil prices continue to stagnate, we can only hope for the best as the region's governments are forced to show their cards.

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