Ivey | Publishing

W20339

DIAMOND DEVELOPERS: REPLICATING THE SUSTAINABLE CITY

In April 2019, Faris Saeed, the co-founder and chief executive officer (CEO) of Dubai-based Diamond Developers, boarded an Emirates flight to Dakar, feeling optimistic that Senegal would be the right place to build the next Sustainable City. As Saeed settled into his seat, he reflected on how much progress he had made in developing a business model based on sustainable living and how much work remained to be done to combat global warming and reduce the carbon footprint of the world's rapidly growing population, especially in emerging markets.

THE SUSTAINABLE CITY IN DUBAI

Faris Saeed had risen from humble beginnings to a prominent position in the Dubai real estate development sector. After completing several large, conventional real estate projects in Dubai, he and his partner, Wasseem Adlouni, conceived, built, and managed The Sustainable City (TSC), which welcomed its first residents in December 2015. TSC was a mixed-use development located in Dubailand, with over 3,000 residents representing 60 different nationalities living in 500 houses and 89 apartments. The community included retail outlets, offices, restaurants, a school for children aged 5 to 18, an equestrian centre, an autism village, and facilities for sports and the arts. The project boasted rooftop solar generation on every home, extensive water and waste recycling facilities, local food production, and car-free alleys between the homes. In 2019, the only component not yet built was the SEE Institute, a centre for research, training, and innovation with a focus on sustainability and the built environment (see Exhibit 1 for an aerial photo of the project). The letters SEE represented the three dimensions of sustainability: social, environmental, and economic.

The original vision of the project was nearly realized, and TSC was a showcase development demonstrating that sustainable living did not need to be more expensive, less profitable, or less comfortable than a conventional lifestyle. The project was a success from the social, environmental, and economic perspectives, and, for three years running, had won the award for the happiest community in Dubai. The community had become a living laboratory for sustainable development, hosting entrepreneurs and researchers able to pilot their inventions in a vibrant community. A 2018 greenhouse gas emissions project carried out in collaboration with the World Wide Fund for Nature provided evidence that TSC's per capita

emissions were well below the Dubai average,[1] mainly as a result of lower energy consumption and the on-site production of solar energy. In terms of economic sustainability, the occupancy rate remained stable at over 95 per cent, even while the Dubai property sector showed signs of oversupply.

The remaining work consisted of continuous improvement projects, such as launching an electric car–sharing scheme, expanding the arts centre, and providing residents with continuing education about all aspects of sustainable living.

With the success of this first significant proof of concept, the main challenge for Saeed became how to replicate TSC to maximize its global impact. Although he repeatedly said he did not invent any particular new technology, the project was widely acknowledged as unique in terms of integrating a broad range of sustainability features into a holistic framework. Building sustainable cities in other locations required careful consideration of which aspects to keep and which to adapt.

Adaptations to the original design were required for several reasons. First, technology had evolved, particularly related to energy; and the costs of solar energy generation and energy storage had fallen quickly. Second, as Dubai was in a unique desert location, other locations would require different solutions to different sustainability challenges. Third, TSC was geared toward a higher price segment. Developing more affordable sustainable housing remained a challenge. Finally, implementing the first sustainable community had taught Saeed several lessons that needed to be incorporated into future projects. However, the vision behind the project did not change, particularly Saeed's definition of sustainability and how that sustainability could be implemented in the built environment.

A UNIQUE VIEW OF SUSTAINABILITY

In line with the available scientific evidence, Saeed had long believed climate change caused by human actions represented an existential threat to humanity. As a result, it was critical for property developers to minimize carbon emissions during both the construction and operational life of a property. To effectively reduce carbon emissions, Saeed concluded that developers needed to pay attention to environmental sustainability considerations and social and economic factors. Building a sustainable project would have no benefit if residents were unaware of the impact of their behaviour and were not encouraged and incentivized to act sustainably. For example, making waste sorting available at the source would be useless if the residents did not sort their waste. At the same time, if economic sustainability meant sustainable construction was unaffordable or unprofitable, then sustainable property development would never become mainstream.

Within this holistic context of social, environmental, and economic sustainability, the team at Diamond Developers defined the various specific areas where they saw the greatest potential for impact. After several iterations, the framework was summarized in a picture (see Exhibit 2) and was referred to as the company's "sustainability DNA."

In the environmental section, six elements were critical to lowering carbon emissions and combating climate change. In TSC, each element had its own strategy, incorporating features and practices that could be rolled out to future projects. With support from Diamond Developers, local and foreign entrepreneurs, and university partners were carrying out pilot projects to develop and test new solutions, thereby turning the community in a living laboratory. In meetings with visitors, Saeed often drew the various elements of environmental sustainability on a piece of paper and passionately explained his thinking behind each:

[1] "The Sustainable City, Greenhouse Gas Inventory 2017," Emirates Wildlife Society–WWF, accessed September 5, 2019, www.emiratesnaturewwf.ae/sites/default/files/doc-2018-09/GHG%20Inventory%20Brochure%202018.pdf.

We have looked at all the ways in which property developers and residents are responsible for CO_2 emissions, both during the construction and the life of a property development project. In the end our goal is to be carbon neutral, making sure that our carbon emissions are zero or nearly zero.

We found six areas where we can have an impact and developed a strategy for each one. In most cases, we did not invent anything new. We just applied and integrated the best solutions we could find, and these solutions will continue to improve as we learn from experience and technology develops.

Energy

Energy use accounted for the bulk of carbon emissions. In Dubai, energy consumption per capita was high as a result of the hot climate and the low percentage of energy generated through renewables. Most domestic electricity consumption was for air-conditioning use. To minimize energy demand, homes in TSC were designed to keep out the heat. Highly insulated walls were oriented toward the south, and double-glazed windows faced north. Each house included energy-efficient appliances, light-emitting diode (LED) lighting, and variable refrigerant flow (VRF) air-conditioning equipment. These design features helped to reduce energy demand by 30 per cent compared with similar conventional homes.

To generate the required energy for each house, solar panels were installed on every rooftop. When demand in a house outstripped the supply from its solar panels, energy was imported into the home from the electricity grid. Similarly, any energy surplus generated during the day was exported to the grid. Through a net-metering system, residents received a monthly bill from the Dubai Energy and Water Authority (DEWA) that calculated the difference between the imported and exported energy, with residents paying only for their net imports. By 2019, households, on average, generated 40 per cent of their energy requirement from their rooftop solar panels. The community also installed solar shading on all the common parking areas, enabling the community to move toward its stated goal of zero net energy, a situation in which solar energy production and total energy consumption were equal.

Food

Food also contributed significantly to greenhouse gas emissions because of the energy used during production and transport of food, and the land used by food production. In the case of meat (particularly beef), animals were also directly responsible for substantial amounts of greenhouse gases. To make matters worse, around one-third of food produced was typically wasted along different stages of the supply chain or at homes and in restaurants. With 90 per cent of food in the United Arab Emirates (UAE) coming from imports, growing food locally and involving the residents in urban farming activities was critical.

To produce food throughout the year, 11 biodomes were placed along the “green spine” running through the city. Leaves & More, a sister company of Diamond Developers, started growing 40 varieties of leafy greens. Residents obtained greens for personal consumption free of charge, and the remainder was sold in Dubai supermarkets. TSC also attracted other food entrepreneurs, including strawberry production inside a shipping container, leafy green production in containers, and the first locally grown spirulina plants. Residents were given plots of land in the community to use as productive gardens. To encourage and educate residents, a free course on urban farming designed by the University of California Davis was provided. In this way, the element of food in TSC not only had a direct carbon impact but was instrumental in promoting community spirit.

Water

Water for domestic use in Dubai was produced by DEWA through the desalination of sea water, which was an energy-intensive process resulting in 4.9 kilograms (kg) of carbon dioxide (CO_2) emissions per cubic metre of desalinated water. In an effort to limit CO_2 emissions from water use, TSC installed water-efficient appliances in each home and implemented a link with the Dubai Municipality (DM) whereby it sent water to the DM treatment plant and imported it back as treated sewage effluent used for landscape irrigation.

Building Materials

The production and transport of building materials and products were other sources of carbon emissions. When TSC was designed, little information was available on the embodied carbon in building materials, making it difficult to know which products had the least environmental impact. One way to limit the environmental impact of construction was to limit waste (e.g., by purchasing only precast walls for the homes). Whenever practical, products were purchased from sustainable sources. Purchasing decisions in the later phases of the project integrated an environmental impact assessment of the products under consideration.

After construction, the community began other initiatives, such as phasing out single-use plastics and other harmful materials. One resident pioneered the installation of liquid ozone units, enabling everybody to obtain sustainable domestic cleaning solutions free of charge. Other residents produced cotton shopping bags by recycling fabrics, replacing plastic bags in the local supermarket. Restaurants supplied their used cooking oil as a resource for biodiesel (B100), which was then used to power building machinery during the final construction phase. The success of these initiatives depended largely on people's behaviour, which needed to be steered through a combination of information, encouragement, education, and regulation.

Mobility Strategies

Mobility strategies in TSC provided another important opportunity for differentiation. The development was divided into five car-free clusters of 100 homes, each with parking on the perimeter, from which residents could either walk home or take a communal buggy. In a city with hot summers and a population of car enthusiasts, many predicted resistance to the idea of finishing the journey home without a car. In practice, the car-free zones in the residential clusters developed into oases with safe playing areas for kids, improved air quality, and cooler temperatures. Shared electric buggies and bicycles became the preferred mode of transport for all short trips inside the city. In partnership with the local Road and Transport Authority, a pilot program with a self-driving shuttle was carried out in 2018. In 2019, an electric vehicle–sharing scheme was planned to limit the need for car ownership and promote the use of electric vehicles.

Waste

Waste represented another major challenge, as Dubai residents produced an average of 3 kg of waste per person per day. Waste was collected in five separate waste bins throughout the community, and separate solutions were developed for electronic waste and construction waste. Some people were unaware of the importance of sorting waste, and once again, the behaviour of residents was as important as the physical features of the project.

SOCIAL AND ECONOMIC SUSTAINABILITY

Besides these environmental sustainability themes, Saeed was keen to promote a thriving community of people. To this end, the company organized a range of social and cultural events, sports activities, and a farmers' market. Unlike other developers, Saeed, Adlouni, and a large proportion of the company staff lived on site, which enabled them to live the lives of their clients and continuously learn about potential improvements. With over 60 nationalities represented among the residents, it was inevitable that people would have different views about what constituted a sustainable lifestyle, but over time a vibrant community evolved, and most residents shared a sustainability ethos.[2]

In terms of economic sustainability, the aim had always been to demonstrate that sustainable living did not require compromises to quality of life, cost of living, or financial return for the developer. Although some sustainability features in TSC resulted in extra costs (e.g., the rooftop solar panels), the company generated savings elsewhere, in both construction (e.g., less cooling capacity) and marketing costs (e.g., advertising through word of mouth). Because of the differentiation offered by the project's sustainability features, TSC units sold or leased faster than in neighbouring communities. TSC could afford to avoid all advertising expenditure, even though competing developers spent significant amounts on advertising on billboards, radio, TV, and the Internet. Visitors included the ruler of Dubai, Sheikh Mohammed bin Rashed al Maktoum; Leonardo DiCaprio; the singer Akon; and hundreds of delegations from universities, schools, companies, and embassies, bringing free publicity and generating word-of-mouth advertising. CNN and other international media, as well as the local press, reported extensively about TSC. All this exposure generated interest among people wanting to live the TSC lifestyle.

Residents benefited financially from the sustainability features through lower energy and water bills, an electric-vehicle subsidy (for early investors), and zero service and maintenance fees. The latter was achieved by giving all homeowners a small share in the mixed-use area. Rental income from leasing out shops and restaurants paid for service and maintenance charges throughout the community, providing substantial savings to residents and incentives to spend locally, encouraging a vibrant mix of retail. Other business benefits included lower staff turnover and lower recruitment costs, as millennials found the company aligned with their values (see Exhibit 3 for the benefits of the sustainable aspects of the company's business model).

To finance car-sharing, future expansion of the company, and innovation in the field of sustainable finance, Saeed established the region's first sustainable real estate investment trust (REIT). At the outset, Saeed sold only 300 of the 500 houses in TSC, and leased 200 houses and 89 apartments to generate recurring rental income. These assets, together with the school building and other properties inside TSC, were transferred to a REIT in which outside investors could buy a share and benefit from an income stream generated purely by environmentally sustainable assets. In the future, additional assets from other projects could be added to the REIT. By 2019, the REIT was established but not yet open for public investment.

To measure the project's performance from a holistic sustainability perspective, the company considered existing sustainability rating schemes, such as Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREAAM), but found them inappropriate, especially for the ongoing measurement of the community's sustainability performance.[3] Instead, a dashboard that was developed in-house showed the key performance measures for the community along all sustainability dimensions. The dashboard remained a work in progress as measures were refined and the company invested in gathering relevant data (see Exhibit 4 for a version of the dashboard used to communicate with all stakeholders).

---

[2] Alan Meier, Richard Tutwiler, Nermin Dessouky, and Angela Sanguinetti, *Promoting a Culture of Sustainability in the Sustainable City: Identifying and Adapting Best Practices* (Dubai, UAE: SEE Institute, 2018).

[3] Tim Rogmans, *Diamond Developers: Measuring Sustainability* (London, ON: Ivey Publishing, 2016). Available from Ivey Publishing, product no. 9B16M075.

REPLICATING THE SUSTAINABLE CITY

Saeed had always intended to share the knowledge and expertise he had built up. Sustainable living made a real difference only if it was adopted by many. To this end, Diamond Developers expanded its own real estate development activity and established the SEE Institute. The SEE Institute's activities involved applied research, training (both face-to-face and online), events, and a business incubator to nurture small businesses in the sustainability field. The SEE Institute maintained relations with universities worldwide, including a multi-year research collaboration with the University of California, Davis and five leading Arab universities. Karim El Jisr, the executive director of the SEE Institute, explained:

> The SEE Institute is our knowledge hub, a place where we develop and spread practical knowledge and expertise related to sustainability and the built environment. Even before the completion of our building, we have been developing partnerships with universities, funding applied research projects, conducting training sessions for working professionals, and supporting entrepreneurs.

Besides developing and spreading knowledge through the SEE Institute, the company planned to replicate its concept as widely and quickly as possible. Building new sustainable cities across the world did not mean the existing design could simply be copied. The development in Dubai had provided valuable lessons that had already resulted in many adaptations during the life of the project. For example, the on-site water recycling facility was replaced by offsite recycling, private buggies were replaced by shared buggies, and the community was phasing out single-use plastics. At the same time, technology was changing rapidly, with the costs of solar energy and energy storage falling drastically. These developments made it feasible to design communities entirely off the electricity grid. Future projects could realistically aspire to be not only net-zero energy but also carbon neutral. Finally, any property development needed to be responsive to the local conditions, including the location's physical features and infrastructure, as well as the institutional, social, and economic characteristics of the country and the project's target audience. There was still the challenge of making sustainable living accessible to a greater variety of income groups, and the company was working on designs that would make the concept affordable for more people.

In 2019, a second Sustainable City was begun in Sharjah, a neighbouring emirate inside the UAE. The Sharjah Sustainable City project's design incorporated many of the features of TSC in Dubai but with adaptations incorporating the lessons the company learned and making the project accessible to a wider range of income groups.

Meanwhile, active interest in the project had been voiced from Australia, the United States, Oman, Jordan, Brunei, Senegal, Poland, and elsewhere. With a relatively small senior management team, the company needed to make some critical choices. As Saeed mentally prepared for his meeting with Macky Sall, Senegal's president, it was clear that outside the UAE, the company needed to partner with local players to access local expertise and resources. Such partnerships could take various forms, ranging from consultancy projects to joint ventures or other arrangements.

For some time, Saeed had contemplated commercializing the company's expertise by offering consultancy services to property developers or government entities across the globe. This option would involve a significantly different business model from the current one, where architects and engineers would be paid based on hourly rates rather than by the value delivered through property development. This consulting model was a difficult fit with the history and culture of Diamond Developers. Many potential partners of the company were reluctant to pay for consultants' time and expertise based on hourly rates. Most likely, the margins would be lower than in traditional property development; reaching the revenue stream generated by just one successful property development project would require billing many consulting hours.

It seemed that becoming an international property developer could offer more control and a potentially higher reward than just selling expertise through consultancy services, but this approach also involved risks. Developing properties in other countries without a local partner meant building up local expertise through experience or by recruiting local staff. Such a strategy might make the company dependent on a few key individuals in each foreign market. On the other hand, partnering with local property developers or government entities, such as sovereign wealth funds, would bring an immediate injection of local expertise and contacts. The choice of partners and the negotiation of a solid agreement were critical. Government-related entities were often bureaucratic and slow to act but could provide stability, access to land, and even access to customers, as authorities could use the project as an opportunity to provide housing to its citizens. Private companies were potentially quicker to act but could lack the clout necessary for swaying regulators and moving the project through the inevitable regulatory hurdles. In some potential markets, generating solar energy for domestic use remained a relatively new concept, and the legal framework homeowners needed to supply energy to the electricity grid was not always in place. Having a partner with strong government links could accelerate the process of implementing the necessary legislation.

A related question was which geographies, or types of countries, the company should focus on. Interest in TSC was generated in a very broad set of countries, and Saeed wondered whether his company's expertise would be better suited to a particular market or region. In the Middle East region, the company benefited from easy access from its Dubai headquarters, cultural proximity, and the shared language of Arabic. Many potential partners from the region had visited TSC in Dubai to see first-hand what the concept was all about. By visiting, they saw that building a sustainable community in an arid climate was feasible.

In emerging markets outside the Middle East, Saeed believed strong relations with government entities could enable the company to realize projects relatively quickly. The company had discussions in varying stages of development with potential partners in the United States, Australia, and Poland. These markets may have had a greater openness to the concept of sustainable living among large sections of the population and, consequently, a willingness and ability to make the necessary investments.

Although Saeed did not distinguish between different types of markets in his vision, the question of prioritization was important. Could the company expand in many countries at the same time, or was it better to focus on certain regions, countries, or types of countries? Simultaneously pursuing many opportunities in faraway locations would demand a great deal of senior management's time. However, as not every opportunity would lead to new projects, and projects could stay in the pipeline of potential deals for years before confirmation, there were advantages to progressing several projects in parallel.

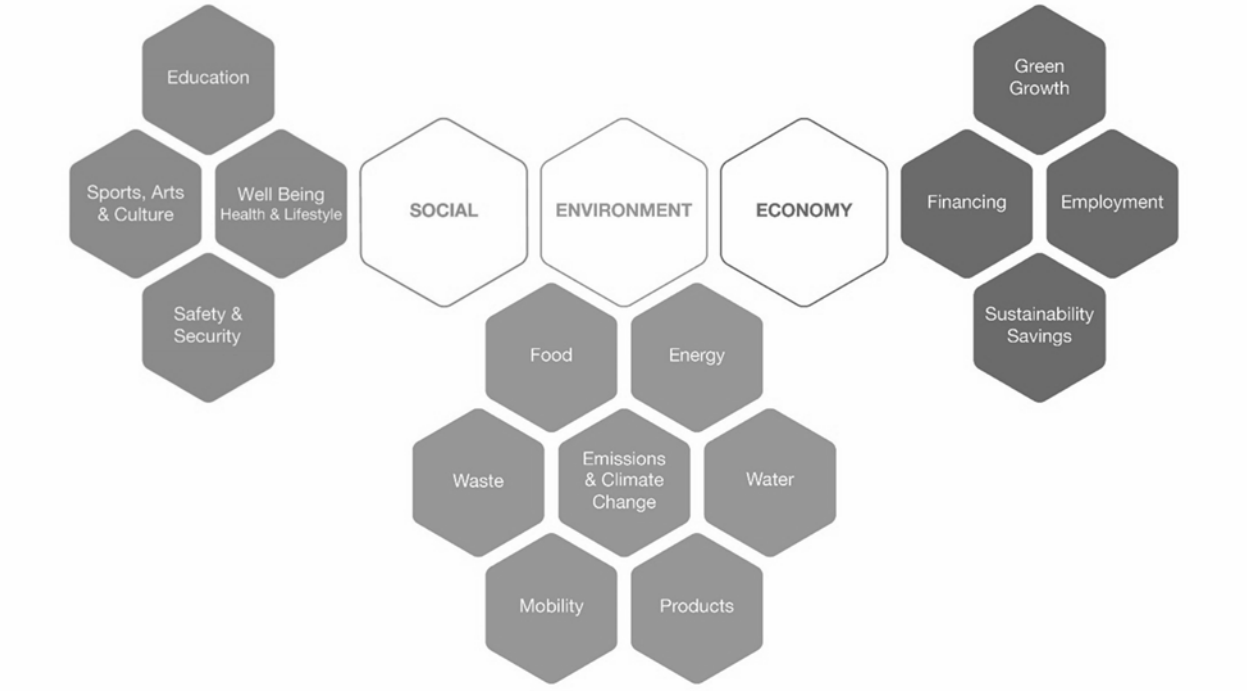
To choose the right mix of activities, locations, and ownership structures, Diamond Developers needed to consider the company's current capabilities and resources. A rapid international expansion necessitated some internal changes, moving away from a family enterprise culture with relatively centralized decision-making toward a more corporate structure. To this end, in 2019, Saeed appointed the company's first full-time head of corporate governance. Rapid growth also required adding skilled employees while maintaining the company's sustainability ethos.

As the pilot announced that the plane was ready to depart, Saeed realized he had plenty to think about and plan during his nine-hour flight to Senegal.

EXHIBIT 1: THE SUSTAINABLE CITY, DUBAI

Source: Diamond Developers.

EXHIBIT 2: DIAMOND DEVELOPERS' SUSTAINABILITY FRAMEWORK



Source: Diamond Developers.

EXHIBIT 3: BUSINESS BENEFITS FROM SUSTAINABILITY

Revenues Full occupancy Market pricing Customer loyalty for outlets in mixed-use area School enrollment	**Intangibles** VIP visits Awards, including "Happiest Community in Dubai" Press coverage Treatment by regulators and suppliers
Value Creation	
Costs Advertising / marketing / selling Public relations Energy & water costs Air-conditioning capacity (capital expenditure) Recruitment costs	**Risks** Reduced turnover rate of residents Less exposure to fluctuating energy prices Reduced staff turnover

Source: Diamond Developers.

EXHIBIT 4: THE SUSTAINABLE CITY DASHBOARD

Source: Diamond Developers.