



Dubai Archipelago from Above: The Aerial Vision-Based Model of Urbanism



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Introduction

Google Earth and airplanes give access to map-scale top-down views of cities. As a result, observers have a perspective allowing them to view the city as a whole in a towering position as if they controlled it from outside. This 'geography from above' empowers policy-makers and city users giving them a sense of control over the visualized object thereby making it submissive to their desires. In this paper, the meaning and agency of aerial vision is first investigated. Then, the systematic fractalization of Dubai's shoreline is analyzed as the case-study of a cityscape that underwent sudden transformation by the agency of aerial vision.

Part 1: Meaning and Agency of Aerial Vision

Meaning of Vision

Ocular and Imaginative Vision

First, the word 'vision' encapsulates essentially two connotations: the act of registering information (which is a visual function), and the act of imagining realities (which relates to the sense of anticipation and is a pro-active response). These two nuances are difficult to dissociate in practice; they are in a dialectical relationship. The process of vision is thus a dynamic that encompasses *visualizing* (seeing things), *understanding* (asking why things are that way), and finally *recombining* the visualized elements (asking why not, i.e. a process of *re-vision*).

Roland Barthes explains that photographs "for all their abstraction, have an oddly constitutive power in the shaping of reality and the perceiving of place and time."¹ The photographic image of a place has the ability to reconfigure the features of that place. As an example, the emergence of the photographic theme of the 'nocturne' at the end of the 19th century has popularized a certain type of lighting and atmosphere and led to the emergence of a new spatial aesthetic out of 'clair-obscur' and neon lightings in the streets of New York.

Totality and Fragment of Vision

Second, vision implies a vantage point, an observer, and an object of vision. There is an infinite stream of vantage points and perspectives for any given object. Seeing the totality of one thing is impossible. Vision implies a choice of viewing angle. It is therefore always partial. The act of viewing, through the choice of a given vantage point, implies the exclusion of other possible perspectives. The choice of a viewing angle is thus a decision to discard all others. Thus viewing an object is really viewing some of its features while overlooking, ignoring or obfuscating some other features of the whole object. (For example, the features of the chandelier that I see from where I am sitting are different from the ones you see from where you are sitting and yet the object is the same. These two viewing angles are only two among an infinite number of possible angles).

Cultural Meaning of Vision

Third, the process of vision is part of a social and cultural context. It belongs to a visual language, it is a cultural construct. There are various ways of seeing the same thing from the same perspective. Vision implies the act of registering and anticipating between a subject and an object. It is part of subjective codes of vision. In fact, Denis Cosgrove reminds us that "how a particular people view, value, and act upon the land is in large part structured through their codes, conventions, and schemata of representation – their cultural images."² A single and same image has numerous possible interpretations for different subjects. An image exists for a specific public through a number of conditions of production, circulation, and reception.

According to Denis Cosgrove: "there are 'ways of seeing' that vary with individuals, genders, cultures, and so on; and there are histories and historical geographies of seeing"³ Human cognitive and emotional relationships to the world operate, but not exclusively, through the sense of sight. The relationship between vision and knowledge varies according to cultures and civilizations. In the western tradition, the visual object has been strongly related to knowledge.

1 Roland BARTHES, *Camera lucida: reflections on photography* (London: Vintage, 1993), p.16.

2 James CORNER, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), pp.xi-xii.

3 Denis COSGROVE, *Geography and vision: seeing, imagining and representing the world* (New York, NY: Macmillan, 2008), p.5.

Hence Saint Thomas' assertion: "One has to see in order to believe" became a creed. The epistemology of vision in western tradition was related to particular forms of power in capitalism or in imperialism.⁴

The distrust of vision at the end of the 20th century is rooted in a number of theoretical disagreements. "Second-wave feminism and post-colonial theory in the 1980s and 1990s argued that the dominant ways of seeing that had emerged with cognitive theories in the West since Enlightenment and their relationship with representation in painting, photography, and moving pictures (as well as with cartography), were phallocentric, colonialist and had ulterior motivations. 'The gaze', as this mode of seeing and its related forms of representation were termed, was described as inescapably voyeuristic, domineering and exploitative."⁵

Vision in non-western cultures such as Sufi tradition has been associated with incompleteness. For Sufi thinkers, the world is mainly invisible (*batin*), and the visible part of it (*dahair*) is only a small fragment of it. This is at the origin of Islam's iconoclasm, where the unseen and the unthought lie at the center of the vision of the world.

Parameters of Vision

Fourth, vision can become parametric. A computer can translate objectively into a 1/0 language a photographic image, the bias of the observer lying in the selection of the angle of the said image. This is part of computational vision. Scientific imagery works on parametric/computational vision. For example, photogrammetry is a technology to get information of an object by photon media, which is recorded on a film or electronic sensor. The information will be registered after digital interpretation of the object.

Specificities of Aerial Vision

Aerial Vision among other Forms of Representation

The writer Louis Marin who describes the different modes of representation of the city since the 16th century draws a distinction between "the utopic representation and two other types of images: the panorama and the map. The panorama is an elevation, a frontal view: the viewer is fixed to one spot on the ground, the city is seen as a horizon in the distance, but only the buildings in the foreground can be seen, the others remain hidden. In the flat plan, the whole city is 'given as a whole simultaneously', but purely as a surface structure, a geometric diagram."⁶ The map's flat image shows a vertical view of the city, but there is no living eye that could see this "view" (except birds). Strictly speaking, there is no "view," and there is no "city." The fact that everything is visible gives away the fact that in truth the so-called "city" is purely a drawn space. One cannot live in a city and truly see it. One can only see a map thereof.

The utopic representation lies between the map and the panorama. The bird's eye view shows a complete image of the city but from a single viewpoint. It is a positioned view, from which point the city seems completely displayed, hiding nothing. A possible view in one sense, and yet also an impossible one, for no one would be able to occupy this total viewpoint for a long time to come: "One can see all. But the eye placed at this point occupies a place that is an 'other' point of view: it is in fact impossible to occupy this space. It is a point of space where no man can see: a no-place not outside space but nowhere, utopic."⁷ The aerial view image has emerged first as a utopic vision.

James Corner explains that the power of the aerial image lies less in its *descriptive* than in its *conditioning* capacity (how one sees and acts within the built-up environment). He says "like other instruments and methods of representation, the aerial view reflects and constructs the world; it has enormous landscape agency, in real and imaginary ways."⁸ Over time, different people see the same world in radically different ways; this development originates more from the ways and means of seeing and acting than from the inherent evolution of the world. The process of description and projection imply taking a particular viewpoint – both spatial and rhetorical – that not only reflects a given reality but is also productive of one. Furthermore, the adoption of a viewpoint in representation is never neutral or without agency and effect. Rather, representations are "projections, renderings of reality that are drawn from and thrown onto, the world. Moreover, the history of painting, literature, and cartography has shown us that a mirror copy of the world, or a description that is so precise and truthful as to be identical to the object it describes is simply an impossible illusion and that the ontological presence of representation itself is unavoidable."⁹ Thus, new instruments of vision have characteristics and specificities (scale, position, and type of observation), and these views are codified as any new language.

4 Denis COSGROVE, *Geographical imagination and the authority of images*: Hettner-Lecture (Stuttgart: Steiner, 2006), p.86.

5 Denis COSGROVE, *Geography and vision: seeing, imagining and representing the world* (New York, NY: Macmillan, 2008), p.4.

6 Jean-Marc BESSE, "Aerial View" in Alex S. MACLEAN (ed.), *Designs on the land: Exploring America from the air* (New York, NY: Thames and Hudson, 2003), p.342.

7 Ibid., p.342.

8 James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.16.

9 James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.16.

Synthetic Vision: Abstract, Diagrammatic and Dimensional

Ernest Hemingway describes his impression inside an airplane: “We headed almost straight east of Paris and the ground began to flatten out beneath us. It looked cut into brown squares, yellow squares, green squares, and big flat blotches of green where there was a forest. I began to understand cubist painting.”¹⁰

The views from above show geometric shapes put in relation with each other. They express a functional relation between things. Everything is there, but oddly is unrecognizable. The view has hidden what we usually perceive from things, their frontal appearance. The view has abstracted the objects to retain their dimensions and relationships. “Gutkind believed that such a view encourages synthetic rather than analytic thought: everything falls into a true perspective, even man himself, as an integral part of the whole.”¹¹

James Corner notes that “from above the various relationships amongst physical dimensions, human activities, natural forces, and cultural values can be seen to be as orderly, productive, and sophisticated as they are brutal and errant.”¹²

Metric Vision

The introduction of measurement into the landscape has radically changed our relation to our environment, as explained in Charles Waldheim’s *The Recovery of the Landscape*:¹³ the metric replaces the scenic. James Corner and Alex McNeal explain their aerial journey into America: “our attention finally settled upon the topic of measure, particularly the relationship between how measures employed in seeing the world affect actions taken within it and how particular kinds of reality are then constructed. The photographs alone soon proved to be insufficient representations with regard to this new focus. Instead the map, with its reference to scale and synoptic mode of representation, increasingly assumed new levels of significance for us.”¹⁴

The interrelationship of numerical, instrumental, and ethical dimensions of measures taken across a landscape, forms the basis of metric vision. “The American landscape is herein presented as a densely measured construction site made up of survey lines, clearings, highways, railroads, hedgerows, fields, canals, levees, dams, buildings, towns, and other spacing’s, constructs and marks that secure settlement and enable human occupation of land. Consequently, the way a particular landscape looks is considered inseparable from, and integral to, the day-to-day activities and values of its occupants.”¹⁵ Thus the quantitative measures of land have a threefold nature: they are the guide, the outcome, and the gauge of cultural activity and meaning.

Agency of Aerial Vision

Aerial Reconnaissance and Survey

There is no innocent eye. As James Corner comes to realize, reality is always read and written with prejudice, and maps are therefore susceptible to ideology and the abuse of power.¹⁶ Powerfully effective symbolic and semantic effects of representation are found in the propaganda maps of irredentist regimes which present national territories in ways that were topographically incorrect in order to promote and control the imagination of the populace. Also, in the area of tourism, maps of national parks, tourist areas, and commercial districts precipitate forms of perception that serve the interests of those who commission the map. Likewise, aerial representations have enabled a new awareness of regional and global ecologies, instigated the planning and large scale settlement of land, and affected the imaginations of millions of people who now live in, and act upon, the Planet.

Aerial Vision and Design

Introductions of new modes of representation have profound impacts on the way space is designed. James Corner explains: “The development of pictorial perspective during the 16th century, for example, profoundly influenced the depiction of space as well as its subsequent design and construction. The gardens at Versailles exemplify perspectival practice, embodying a shift in spatial and aesthetic sensibility and at the same time symbolizing the new regal power of 17th-century France together with the development of Enlightenment science.”¹⁷

Similarly, Adnan Morshed highlights the influence of the aerial view on the design of cities in Le Corbusier’s projects. “The early 20th-century invention of the airplane brought on a cultural euphoria that influenced the works and writings of urbanists, architects, artists, and science-

¹⁰ Ernest HEMINGWAY, “Vision and painting” in Rupert MARTIN (ed.), *The view from above: 125 years of aerial photography* (London: Photographer’s Gallery, 1983), p.2.

¹¹ Denis COSGROVE, “Aerial vision” in James CORNER (ed.), *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.4.

¹² James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.xix.

¹³ Charles WALDHEIM, “Aerial representation and the recovery of the landscape” in James CORNER (ed.), *Recovering landscape* (New York, NY: Princeton Architectural Press, 1999), p.78.

¹⁴ James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.xvi.

¹⁵ Ibid., p.xvii.

¹⁶ Ibid., p.18.

¹⁷ James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.16.

fiction writers during the 1920s and 1930s. Le Corbusier's urban design for Rio de Janeiro – which he sketched, so he claimed, from an airplane – offers a visual basis to study how the aesthetic experience of flight was translated spatially, visually, and politically into his design of the future city.”¹⁸ Through the aerial ‘discovery’ of the geography of South America, Le Corbusier understood that there was a new empowerment in the act of looking from above, which profoundly influenced his design interventions.

The advent of flight ushered in new kinds of visual and spatial perceptions that went beyond the traditional bird’s-eye views of the post-Renaissance era. “It posed a set of theoretical questions for urban designers: What is the implication of an aerial viewpoint on our perception of an object? How does our mental image of cities and geographies change when we look at them from above? How does the particular mode of looking from above affect design strategies?”¹⁹ Le Corbusier sketched his design when he had “gone up in a plane for observation and glided like a bird over all the bays.”²⁰ But he did more than just observe: “In the plane, I had my sketchbook, and as everything became clear to me, I sketched . . . the ideas of modern planning.”²¹

Le Corbusier’s first flight was in 1928, only a year after Lindbergh’s flight across the Atlantic, but it was his flying over South America in 1929 that provided him with the opportunity of truly internalizing the aerial experience in his thinking. Upon arrival in Buenos Aires, Le Corbusier met Antoine de Saint-Exupéry, the famous writer, pilot, and operations manager of the pioneering French Compagnie Générale Aéropostale that had established a number of aerial routes within the continent. Aéropostale invited Le Corbusier to participate in a number of inaugural passenger flights over the delta of the Paraná, the estuary of the Rio de la Plata, the Pampas, Buenos Aires, Asuncion, Montevideo, São Paulo, and Rio de Janeiro. Saint-Exupéry described the exploration of a “new geography from above” in his important literary works of the time: *Vol de Nuit (Night Flight, 1931)* and *Terre des Hommes (Wind, Sand and Stars, 1939)*.²²

In *Aircraft*, Le Corbusier described his own reactions to flight: “The airplane, in the sky, carries our hearts above mediocre things. The airplane has given us the bird’s-eye view. When the eye sees clearly, the mind makes a clear decision.”²³ Although the airplane has today become commonplace, in the early twentieth-century flight had a profound impact on popular imagination, as well as on intellectuals and artists. Filippo Thomaso Marinetti, Robert Delaunay, Guillaume Apollinaire, Kasimir Malevich, and László Moholy-Nagy, internalized aerial themes into their search for new spatial dynamics. Le Corbusier’s *Aircraft* belonged to this evolving “genre” of aerial discourse. For Le Corbusier, the airplane filled two modernist ambitions: firstly, to promote the idea of a new age based on machine aesthetics, and secondly, to view a hitherto unseen world from a high point as through the eyes of the *dieu voyeur*. Le Corbusier was elated by the idea of flying and seeing the world from above. In a chapter in *Towards a New Architecture* (1925), entitled “Airplanes,” Le Corbusier shows his doubly operative gaze: looking at the airplane, but also looking *from* it.²⁴ In the first image in the book, he looks at the airplane as a modern aesthetic object; in the second, he gazes down from the airplane’s cockpit at an otherwise unseen geography.

A new ‘scale of greatness’ is revealed with aerial view extending the relations between the city and the landscape. In South America, Le Corbusier developed urban design ideas not only for Rio de Janeiro, Montevideo, São Paulo, and Buenos Aires. The Cartesian perception of space of his earlier work was now replaced by the linear distribution of the viaduct that would appear again in his 1931 project, the “Plan Obus” for Algiers. In Algeria, Le Corbusier also took part in a number of aerial expeditions, his pilot friend Durafour flying him to the country’s desert cities of the M’Zab region. “From the airplane, I was able to discover the principle of the towns of the M’Zab. The airplane had revealed everything to us, and what it had revealed provided a great lesson. For one day soon, the implication of the bird’s eye view, that nobility, grandeur and style should be brought into the plan of our cities, will be a fact. A new scale of greatness will impel the architecture of the city and the scope of its undertakings.”²⁵

Le Corbusier’s designs for South America and Algeria showed how the symbolism and experience of flight were translated spatially, visually, and politically into the city of the future. “Rather than simply proposing the trajectory of future urban planning, the Corbusian projects combined the very nature of seeing, and eventually of spatial organization, with a complex amalgam of geographical, technological, and moral questions stemming from aerial themes.”²⁶

18 Adnan MORSHED, “the cultural politics of aerial vision: Le Corbusier in Brazil” in *Journal of Architectural Education*, 55 (May 2002): p.201.

19 LE CORBUSIER, *Précisions: On the present state of architecture and city planning*, Edith SCHREIBER AUJAME, trans. (Cambridge, MA: The MIT Press, 1991), p. 235-236.

20 Ben DALEY, “Writing from Above: Representations of Landscapes, Places and People in the Works of Antoine de Saint-Exupéry,” *Journal of Cultural Geography* 26 (June 2009), pp.127-147.

21 LE CORBUSIER, *Aircraft* (New York: Universe Books, 1988), p.13.

22 Adnan MORSHED, “the cultural politics of aerial vision: Le Corbusier in Brazil” in *Journal of Architectural Education*, 55 (May 2002): p.202.

23 LE CORBUSIER, *Aircraft* (New York: Universe Books, 1988), p.12-13.

24 Adnan MORSHED, “the cultural politics of aerial vision: Le Corbusier in Brazil” in *Journal of Architectural Education*, 55 (May 2002): p.207.

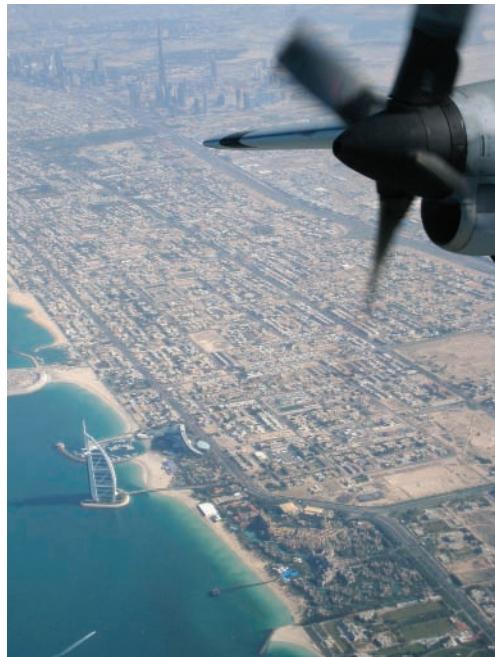
"Le Corbusier's aerial discovery of the law of the meander created a broad framework for the representation of, and intervention in, the territory. The curving line that he drew from the airplane, ironically, became a 100-meter-high megastructure – suggesting a tentative assimilation of Brazil's impoverished *sertão* – a hovering megastructure that negated the backlanders' very concept of rootedness in their own soil."²⁴

View from Outer Space

With the first images of the Earth from the Apollo missions, it appears that humanity has reached a perspective enabling it to act on Earth and its nature as if it controlled it from 'outside.' "The ability to see the world from above culminated in the Apollo photograph of the spherical Earth, whole and un-shadowed taken in 1972. Responses to that image have stressed the unity of the global vision coupled with the need for local sensitivity in a globalized world."²⁵ Today, satellite technologies which offer "zooming" and "panning" navigation capabilities, reinforce the concept of Earth as the "object." In fact, the interface of Google Earth at log-on resembles the image of Earth taken by the Apollo 17 mission.²⁶

The aerial view has this interesting zooming quality, it spans from the macro to the micro scale. Mark Dorrian makes an analogy between the aerial view and the microscope view. He explains: "in contrast with the telescope, the microscope requires that one gazes down in aerial fashion into the eye-piece. Rather than being directed toward a constellation of objects at variable distances from the eye, the microscope is instead directed toward a surface or screen, the flat slide within which the prepared object of study is held. With the microscope, the light that permits scrutiny does not radiate from the object but rather (at least historically) from above (the position of the observer) albeit redirected to illuminate the slide from behind by a mirror. This set-up reproduces the basic structure of the aerial view and it comes as no surprise to find early aviators analogizing the view from an aeroplane to that through a microscope."²⁷ Similarly, of his experiences as a war pilot, Antoine de Saint-Exupéry wrote: "All I can see on the vertical are curios from another age, beneath clear, untrembling glass. I lean over crystal frames in a museum; I tower above a great sparkling pane, the great pane of my cockpit. Below are men – protozoa on a microscope slide – I am a scientist, and for me their war is a laboratory experiment."²⁸

This 'geography from above' empowers policy-makers and city planners through a feeling of control putting the subject of vision under their spell and making it submissive to their whims. Dubai has embraced a re-vision of itself. Through this daring process, it has materialized and experimented with an aerial vision-based model of urbanism. Rem Koolhaas even noted that "Dubai is a laboratory where one makes discoveries."²⁹ Dubai's (re)vision of itself is simultaneously ocular and imaginative, as it belongs to the sense of sight and the sense of anticipation.



[fig. 1] Aerial view of the shoreline with the iconic Burj Al Arab, Dubai's first artificial island experiment.

²⁵ James CORNER and Alex S. MACLEAN, *Taking measure across the American landscape* (New Haven, CT: Yale University Press, 1996), p.4.

²⁶ Stacy BOLDRICK, "Reviewing the Aerial View: A Tool of Explanation, Wonder and Domination. Miniaturizing Ourselves, Amplifying the Miniature," *Arg* 11(1) (2007): pp.11-14.

²⁷ Mark DORRIAN, "The aerial view: Notes for a cultural history" in *Strates*, ed. Frédéric POUSIN and Hélène JANNIÈRE (Paris: CNRS, 2007).

²⁸ Antoine de SAINT-EXUPÉRY, *Pilote de guerre*, (Paris, Gallimard, 1942).

²⁹ Rem KOOHAAS, "Dubai est un laboratoire où l'on fait des découvertes," *UlysseMag*, Jan. 2009. <http://www.ulyssemag.com/article/2009/01/01/dubai-est-un-laboratoire-où-l-on-fait-des-découvertes-0>

Dubai archipelago projects exemplify the three steps of vision, as presented in the first part of this development: visualizing (seeing things), understanding (asking why things are that way), and finally recombining (asking why not). As a result, the 'Dubai model' envisioned iconographic artificial island projects (Burj Al Arab, Palm Jumeirah, Palm Jebel Ali, Palm Deira) to freshen up the city aerial looks through new tentacles and appendices in the hope of putting the city on the tourist map [fig. 1].

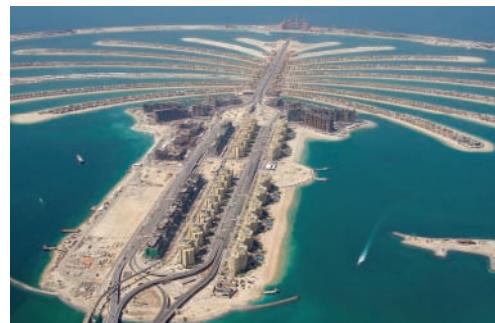
Part 2: The Construction of Land and Representation through the Satellite View

Strongly bound to cities, images are the instruments through which subjects make sense of their environment and transform it. Since 1999, Dubai has been engaged in planning and building three artificial island formations off its coast. Promoted as the "largest man-made islands visible from space" and self-declared as "the eighth wonder of the world," the Palm islands are shaped as date palms in their outline adding more than 520 kilometers of reclaimed coastline to existing shores of approximately 72 kilometers. The developer, Nakheel, had engaged the palm motif not only because Nakheel means "palm" in Arabic but also because such a shape for the reclaimed land naturally extends coastline without expanding land area.

Both the construction on the ground and representation of these new island developments are made possible through high-resolution satellite imagery technology, whether through a Differential Global Positioning System (DGPS) for precisely dropping sand and rock from the dredging boats, or through virtual globe software such as Google Earth for the visualization and global circulation of Dubai's promotional images.

The creation of the Palms is presented as the vision of the ruler Cheikh Mohammed Bin Rashid Al-Maktoum for the future of the city. As it appears in the developers' presentations, the builder is the ruler himself who is intent on articulating an Arabic poem "written in stone" on water. But the gigantic iconic interventions are made possible mainly through the technology of satellite imaging. The GPS guides both the ships that spray sand dredged from the bottom of the Gulf as well as the cranes that lay the breakwater rocks on the outer edge of the Palm's encircling crescent. When the government-owned company, Nakheel Properties, was considering land reclamation in the 1990s, the dredging contractor Van Oord was invited to tender. As it realized that the situation demanded something more than the usual landfill project for a harbor, Van Oord demonstrated to Nakheel that land reclamation could generate terrific revenues with a calculated result of 15 millions beach visitors per year.

Combining images of sand, waterfronts and exotic travel destinations as well as tax free bonanzas, the iconic form of the Dubai Palm places the city on the global tourist network and real estate market. Being too vast and stretched too far out into the sea, the Palm islands can hardly be encompassed from a single viewpoint on the ground and its iconic form is best appreciated via aerial or satellite views by a subject flying above the city or surfing its web pages. Thus, the image of the Palms takes primacy over its physical appearance. The Palms, having been widely circulated via the web are more visited and marketed in the virtual than in the physical space. For the virtual subject, the web-based Palm sales offices enable the potential investor to visit the showcased properties throughout the various island layouts. In the global tourist industry, the Palm as logo brands the city as an inviting destination. Blending the real and virtual, the Palms portray a paradoxical relationship between a material infrastructure, a virtual presence, and physical repercussions of such an image on the financial investments and tourism industry of the city.



[fig. 2] Aerial view of the artificial island of Palm Jumeirah, March 8, 2008 (Courtesy of Nakheel).

The image and land of Dubai are constantly changing with the planning and implementation of the different Palm projects: Palm Jumeirah [fig. 2], Palm Jebel Ali and Palm Deira. Between an existing condition and a projected vision, the city is reproducing its first Palm Jumeirah island to attract more investments and visitors. The creation of the Palm islands began with Palm Jumeirah (25 square kilometers) in June 2001. Shortly thereafter, the Palm Jebel Ali (37

square kilometers) was announced and reclamation work began. The Palm Deira development (46 square kilometers) began in 2003 and its reclamation phase will presumably be completed in 2015. Today, the first Palm is occupied by 3,000 families, the second is starting the urban development phase, while the third is still at the reclamation phase. Although the three islands are similar in shape, they present significant differences as they operate at different scales, programs, and contextual conditions in relation to the existing Dubai hinterland.



[fig. 3] Aerial view of the fronds of Palm Jumeirah from a helicopter, November 1, 2008.

It is interesting to examine the relationship between these three developments and their corresponding city districts: Palm Jumeirah is linked to the very dense residential area of Dubai Marina [fig. 3], Palm Jebel Ali to the mixed zone with many large scale infrastructural projects such as the Jebel Ali Port Harbor. Palm Deira for its part is connected to the oldest part of the city and to an array of traditional markets.

Stressing how subjects mentally organize their sensory experiences, Kevin Lynch has highlighted reciprocity between the production of urban images and a frontal perception of the modern city. As urban imagery is tightly linked to modes of visualization, new media developments and particularly satellite mapping are changing our image of the city and how we perceive, experience and design it. As contrasted with cities such as Boston described by Lynch for their readability from the ground, Dubai lacks orientation elements seen from such a perspective. Nabil Chenaf, a local architect and professor at the American University of Dubai, explains that while Dubai has four times more landmarks than Boston, finding one's way for all but the street smart users. GPS and mapping software are not providing solutions to the problem because of the speed of the construction process. In fact, streets are continuously created, modified, extended preventing any reliable mapping revision.



[fig. 4] Satellite view of Dubai within the United Arab Emirates, June 29, 2009 (Courtesy of NASA).

Using mobile communication technology, people have developed alternative strategies to navigate the city. While mobile telecommunication today is still more efficient than visualizing media like satellite images or mapping software, this situation is likely to change as the monopoly of real-time visualizing media by the military is progressively ending. Given the deep penetration of the mobile telecommunication technologies, one can imagine how real-time satellite viewing can create a revolution in our perception and navigation of the city.

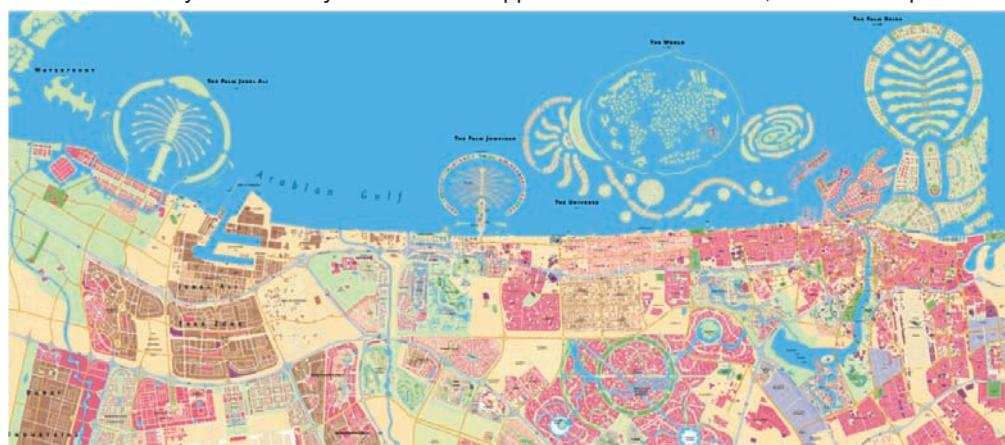
Both as image and new land, I argue that the emergence of Dubai on the map is related to satellite technology [fig. 4], to the construction of artificial islands and to a new urban strategy or model. The Gulf is now the locus of a new regional rivalry on the most iconic artificial islands where palms, world maps, pearls, sea horses, crescents compete to get media attention. Less than 20 years after the first Palm project was discussed, a few countries outside the Gulf region are also following the trend. For its 2014 Winter Olympics, Russia is constructing the Sochi artificial islands in the Black Sea, a micro replica of the map of Russia on 330 hectares. The project was presented in 2007 by the firm Erick Van Egeraat to President Vladimir Putin. Also in 2007, Prime Minister Balkenende exposed to the Dutch parliament the possibility of building a Tulip Island of 60,000 hectares to showcase its engineering technology, and protect its shores against storms. In the same year, China expressed its desire to have an artificial island of 2,800 hectares in the form of a dragon in Kumming.



[fig. 5] Satellite view of Dubai and its artificial islands, November 17, 2009 (Courtesy of NASA).

What makes the Palm islands significant is their ability to create a new world, and particularly to extend the city onto the water. The sea as a frontier in the Gulf region is starting to be invested and a whole new urbanity is in the offing. The Palms bank on their simultaneous proximity and distance, connectedness and detachment from Dubai, on context and absence thereof. While these islands are anchored to the mainland, close to shores, and on shallow water, they present a critical distance with the rest of the city [fig. 5]. The Palm islands take advantage of the tension between the virtual and the real, between their cyber-presence and the tons of rocks and sand that form their foundation into the sea.

Environmental scientists at Nakheel explain that they have discovered many new species such as seagrass meadows in the channels between the fronds and along the crescent of Palm Jumeirah. According to them, the richness of flora and fauna taking advantage of the habitat offered by the new projects exceeds the diversity previously found on the site. However, looking at the scale of the new projects relative to the Gulf, this shift in species composition is rather minor and localized and is unlikely to have an effect on the broader marine environment. The ecological question facing any megaproject using land reclamation technologies has to be addressed in a systematic way wherever it is applied in the Middle East, Asia or Europe.



[fig. 6] Map of the Dubai archipelago (Courtesy of Belhane Mapping, Germany).

Dubai is undoubtedly feeling the global economic downturn, and a number of projects have been postponed or slowed down. This is naturally affecting the Palm projects. Today, the Palm Jumeirah artificial island is painfully nearing its full completion. The Palm Jebel Ali and Palm Deira projects are put on hold. But for the dredging engineers of Van Oord, the Middle East and the Gulf in particular will remain an important market for a long time, and the long-term world market prospects in the land reclamation sector are enormous because there is a growing demand for new coastal lands.

Conclusion

Dubai is the archetype of a city that was transformed by and through aerial vision. But, a legitimate question might be: whose aerial vision is it? Some people have interpreted the fractalization of Dubai's coastline as a physical outcome of an enduring orientalist image [fig. 6]. Is it the representation of an idealized Orient seen by and built for Westerners in a rapidly globalizing world? Or, is it a boldly-reinvented model of urbanism based on contemporary visualizing technologies? Today, the challenge for cities of Middle East and North Africa is to ride on the new wave of information and communication technologies to develop, with the pioneering spirit of Dubai, contemporary and innovative models of urbanization. These will have to break with a slavish repetition of the past to invent new projections of identity of which new generations of nationals can readily sense ownership and which visitors will also appreciate. The 'Dubai model' will have to go through a series of revisions to take on board other technologies addressing global challenges such as, the reduction of the carbon footprint and the greenhouse gas emissions. Is Dubai able to adapt its original vision to achieve sustainable growth and development and, at the same time, tackle issues such as global warming? This is where the 'why not' vision becomes crucial.