Chapter 10
The Best City?

Rob Roggema

Contents

Abstract Designers have long tried to design the best possible city. Many examples illustrate however that buildings and cities are although designed with the best purposes, in reality not function very well. The local climate is often difficult to

R. Roggema (✉)
The Swinburne Institute for Social Research, Swinburne
University of Technology, PO Box 218, Hawthorn, VIC 3122, Australia
e-mail: rob@cittaideale.eu

influence the designs in a way that these buildings are successful, even more needed in a changing climate. Explorations of the past planned, sustainable and self-organising cities illustrate that despite the fact that these cities were developed with honest and valuable goals, there are many side effects that contradict with the original aims. When smart people from another culture, without constraints about regulations and political habits are asked to design the best city, a wide range of climate adaptive strategies are implemented in the designs.

It is clear that the best city doesn't exist, but six actions are distinguished that enhance climate adaptive cities: analyse networks, focus on key nodes, free self-organising developments, plan the unplanned, release control and check-up regularly.

Keywords Best city • Sustainability • Art of designing • Self-organising • Climate adaptation

10.1   Introduction

Recently I visited Delhi. Dr. Sundaresan Pillai of CSIR invited me to present the Diamond Jubilee Lecture. During my stay, I had a very pleasant dinner with my friend Sanjay. We talked about many subjects, amongst which how to increase sustainability as designers. Sanjay told me about one of his projects, in which the design for new schools was undertaken in full collaboration with the future users. We concluded that thorough sustainability could only be achieved when people are given the opportunity to internalise sustainability goals, measures and strategies. In our opinion, this could only be achieved if designers support the future users of the design to envisage, design and build their own desirable future. A designers' role as the person who is delivering his personal piece of architecture from *heaven*, bringing the best design according to *his* own standards to the people that are supposed to use its creation, is often contra-productive. Only time-consuming investments in local people will internalise aims of sustainability and hence deliver designs that are developed locally and reflect the locally and individually felt best and most sustainable solutions. These designs are filled with local knowledge about the environment, culture and local desires, knowledge that cannot be grasped by any designer from the outside. However, to be able to support local groups to invent their own sustainable design solutions is intensive and very time consuming albeit rewarding too. The way we were identifying a best practice in sustainable design resonates with the design charrette approach (see Chap. 7), which requires the designer to position himself out of the limelight, substantial time investments and building of relationships and the ability to work while there is no certainty beforehand about the outcome of the design process. It is often easier to hire a famous architect to deliver his piece of artwork …. When taking a look at several recent examples of design the question can be asked how specific and locally embedded current architecture and city planning and design really is?
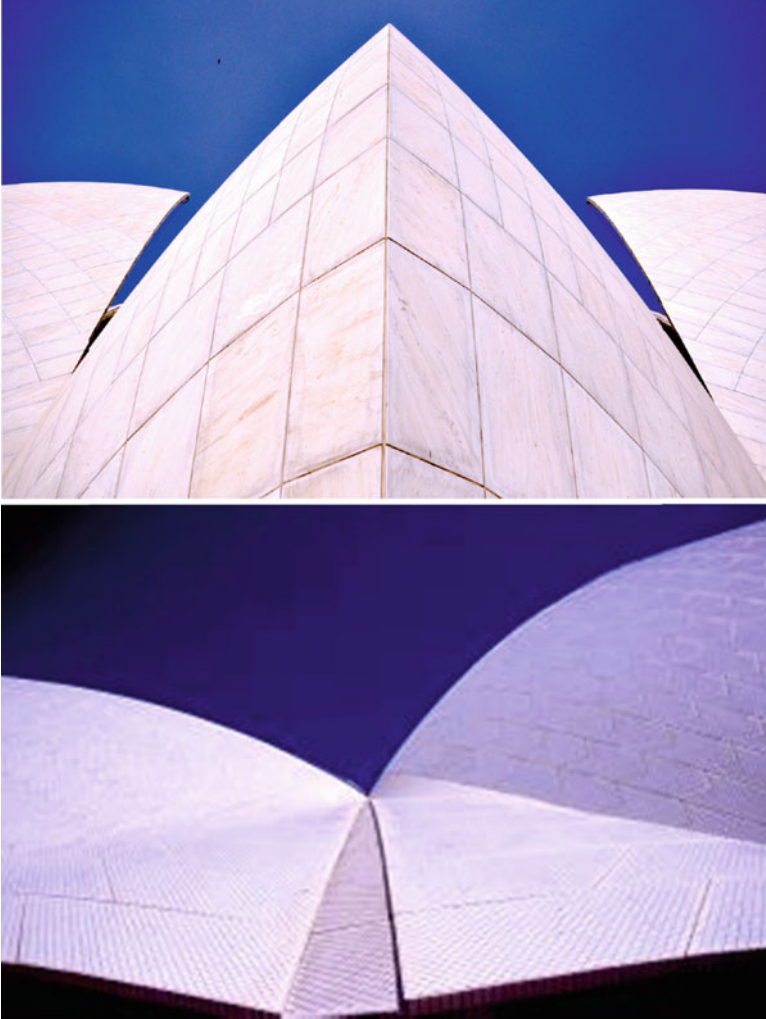
Fig. 10.1 Two pieces of architecture: Lotus Temple and Opera House. Or: Opera House and Lotus Temple? (Photo's: Rob Roggema)

The two pictures in Fig. 10.1 were made within 1 week. Still, it is not the same building. One of the pictures shows a part of the Lotus Temple in Delhi and the other does the same from Sydney's Opera House, both beautiful pieces of architecture. When looking at the whole building (Fig. 10.2) it becomes clear which building is located in India and which one in Australia. These buildings could be brother and sister twins, because they look very similar. The peculiar part of this is that the similarities in both buildings are not underpinned by local climates nor can it be culturally explained. The hot and sticky summer in the Delhi metropolis cannot be compared with Sydney's summer sea breeze, which, even on the hottest days of the

Fig. 10.2 The Lotus Temple and the Opera House (Photo's: Rob Roggema)

year, has a pleasant cooling effect. The shape of the buildings and the choice for their white skin has most likely not been influenced through the local climate.

This example does not stand alone. The two images of Chinese pavilions in Fig. 10.3 illustrate that huge similarities are realised apart from the climatic or local context. Both the hotel in the Dutch village of Breukelen as the pavilion in Melbourne's inner western suburbs look alike, but have to deal with fundamentally different climates.

Even more extravagant are the two hotels in the Amsterdam metropolitan area (Fig. 10.4). The *Sea palace*, again, exhibits the properties of a Chinese pavilion, and is adapted to its environment (the Amsterdam harbour) by making the building

Fig. 10.3 Breukelen The Van der Valk Hotel (http://www.rederijvonk.nl/salonboot-varen-vecht-omgeving/hotels-aan-de-vecht.html) and the Chinese pavilion in Melbourne's Inner Western suburb (Photo: Rob Roggema)

floating. The other hotel, Inntell in the Northern suburb of Zaandam is a high-density aggregation of, artificial, old houses and facades that used to be built in the area. In a certain sense both hotels have been adapted to the local environment or history. The question however, may be raised how locally adapted these buildings really are, or, did local and future users of the building and urban environment have any

Fig. 10.4 Sea palace Amsterdam (http://www.worldisround.com/articles/331017/photo28.html) and Inntel hotel Zaandam/Amsterdam (http://www.happy-pixels.com/2011/06/08/zaandam-hotel/)

influence on the design, or have they been offered a role as co-designers of the project? The most likely answer in both these cases is negative.

When Le Corbusier, who was born as Charles-Édouard Jeanneret, designed the buildings for the Capital Complex in Chandigarh, he designed them as if they were to be built in Paris. The enormous thermal mass lets the buildings function in the hot Indian summer as stoves. It makes air-conditioning a necessity. Many facades are therefore, against the original intentions of Le Corbusiers design, covered with air-conditioners, such as on the Assembly building (Fig. 10.5).

The English style Victorian housing dropped in Melbourne has difficulties dealing with the Australian hot summers, as the English designed and build them after

Fig. 10.5 The Assembly building in Chandigarh (Photo: Rob Roggema)

Fig. 10.6 Victorian housing in Melbourne's inner west (Photo: Rob Roggema)

examples from home in the early days, and they were optimal prepared to deal with rain (Fig. 10.6).

Or take a more recent example, the design for the Etihad stadium in Melbourne's Docklands (Fig. 10.7). This huge stadium is oriented as if the sun shines from the south: the European architect assumed (or just forgot) that in the Southern

Fig. 10.7 Etihad stadium, Melbourne (Photo: Rob Roggema)

Hemisphere the sun isn't similarly oriented as in the Northern Hemisphere. As a consequence, the grass in the stadium has difficulties to grow.

These random examples illustrate that, in several occasions, in current times and in history and by famous architects, the local climate is not always taken as the basis for the design, leading, in many occasions to serious suboptimal conditions. Other considerations were probably more important, such as habit, the drive to showcase new architecture, or just forgotten. When taken beyond architecture, the question may be raised what the best city is, if at all this can be defined.

This question is not new. In 1516 Thomas More described his island Utopia (Fig. 10.8) (Logan and Adams 1989) and many followed. In the book 'Ideal Cities: Utopianism and the (Un)Built Environment', Eaton (2003) describes them all. Rem Koolhaas' with his 'The voluntary prisoners of Architecture', from Pieter Breugels painting 'Luilekkerland' to Archigrams 'Instant City' and Superstudio's 'Continuous Monument' and everything in between: Medieval miniatures of heavenly cities, geometrical ideal- and fortified cities dating back to the Renaissance, American grid-cities, the Chaux by Ledoux, The Phalanstere of Fourier, Port Sunlight, Ebenezer Howard diagrams, Paul Citroens 'Metropolis collage', Expressionistic, Constructivist and Futuristic cities from the Twenties, Hugh Ferris' chalk drawings of an idealised New York, Le Corbusiers plans for Parijs, Frank Lloyd Wright Broadacre City, New Babylon or Friedmans' Space Frame Cities.

Fig. 10.8 The island
Utopia by Thomas More
(1516)

But as many tried to design and describe the ideal city, even so many failed. How can we describe the ideal city? This question, one of the most difficult to answer, is subject of this, final, chapter. Some clues can be identified. The ideal city must be sustainable, but not dogmatic. It must be clean and safe, but not boring. And the ideal city must strive for order, but in a flexible way. One element unifies the former. Rules are not put in place to determine the design interventions, but it's the other way around. The intervention is the rule. The intervention rules and directs developments. According to the Scientific American, this future, better, greener and smarter city is urban (DiChristina et al. 2011). The role of social (cyber) networks in increasing connectivity and faster solutions is emphasised (Ratti and Townsend 2011), as well as the potential of shantytowns, slums and favela's as the places where creativity and innovative solutions find their origin (Neuwirth 2011). The key message is that new and sustainable solutions can be expected from these unexpected places more than from the established and well-organised western world. Again, where rules do not hinder creativity and the intervention is the rule.

In this, final, chapter explorations on the 'best city' lead us to cities that were planned from scratch, the ideal starting point to design the best possible city, to

cities that were planned with the specific aim to create a sustainable city, and to cities that emerged, and were not planned. Secondly, the findings of a design session aiming to design the best climate adaptive city are discussed. The chapter concludes with a first description of the art of designing for climate adaptation.

10.2 Best *Planned* Cities

10.2.1 *Chandigarh, India*

The city of Chandigarh in the north of India was developed as the Capital of India in the 1950s of the twentieth century. The design of the Masterplan (Fig. 10.9) and several of the major buildings in the city were designed by Le Corbusier.

The city is subdivided in sectors of the same size. The clear pattern is very readable, buts especially from the map or drawing board. Because the topography is not very accentuated, the repetitive pattern doesn't work as the regular system,

Fig. 10.9 The Chandigarh Masterplan (Photo: Rob Roggema)

Fig. 10.10   Typical street in Chandigarh (Photo: Rob Roggema)

within which the topography causes the exceptions. The street pattern consists of broad streets with a surplus of green and tress alongside them (Fig. 10.10).

Within the rigid urban pattern a couple of exceptions are contributing to the readability of the city. The riverbed to the West as well as the Capital Complex area in the North both function as points for orientation. The city centre (sector 17) is well known by everyone in the city, but can't be recognised as the centre of a large city. It appears as just another sector and intensified use or high-rise buildings one would expect in a city centre aren't there. The main quality of the city centre is the large open public spaces (Fig. 10.11) and the fact that most of the shops are found here. Furthermore, ground level is split in order to separate pedestrians and car traffic (Fig. 10.11). Because of the sizes of the superblocks, distances in the city are large and a car is required for transportation. This results in large spaces for car parking around the city centre.

The Capital Complex is designed as a free open space with big buildings amidst it. Several of Le Corbusiers most famous buildings are realised here, such as the Secretariat, the Assembly and the High Court (the latter two are in Fig. 10.12). Because of the fact that Punjab, of which province Chandigarh is the current capital, has to deal with political tensions, the free open space is hardly free. Many security points limit free wandering.

The city of Chandigarh cannot be compared with any other Indian city. It is a lush and very spacious city, where large public spaces, roads and green dominate the city lay out. Due to the distances the city is hardly walkable and ordinary Indian forms of transportation take over the road: auto-tuktuk, rikshas and cars. The accompanying horning reminds one of being in India. The iconic buildings are big and seem to be designed to impress. After more than 50 years of existence, Chandigarh

Fig. 10.11 Images of Chandigarh's city centre (multi-level crossing (*top*) and public space (*bottom*)) (Photos: Rob Roggema)

is ready for a makeover. In order to showcase its original values it needs to refurbish and refresh its public spaces, reconstruct and redesign many of its buildings and it needs rethink its traffic strategy: it could replace current road use (partly) by clean, fast and cheap public transport.

The climate in Chandigarh, especially in summer is hot and sticky. The city design, with its wide boulevards draped with trees provides shade and cooling. Water is not abundantly apparent in the city. However, the cities spacious layout gives Chandigarh a better liveability than most Indian cities.

Fig. 10.12 Iconic buildings in Chandigarh, designed by Le Corbusier: Assembly building and High Court (Photo's: Rob Roggema)

10.2.2   *Brasilia, Brazil*

The city of Brasilia was founded in the late 1950s of the Twentieth century and became Brazil's capital in 1960. The city was planned from scratch and gave designers, amongst them the lead designer Oscar Niemeyer, a free hand of designing the best city possible. The Masterplan followed all the rules of modernism: large blocks, lots of green spaces and separated traffic types. The grand design consisted of an urban pattern, which was shaped as a bird (Fig. 10.13).

Many of the residential neighbourhoods (Fig. 10.14) were built up around the traffic networks of wide roads, separated by green, all placed at respectable distances from city centre, amenities and each other. A car is almost a basic condition to live here. The residential blocks were lifted from the ground in order to let public green

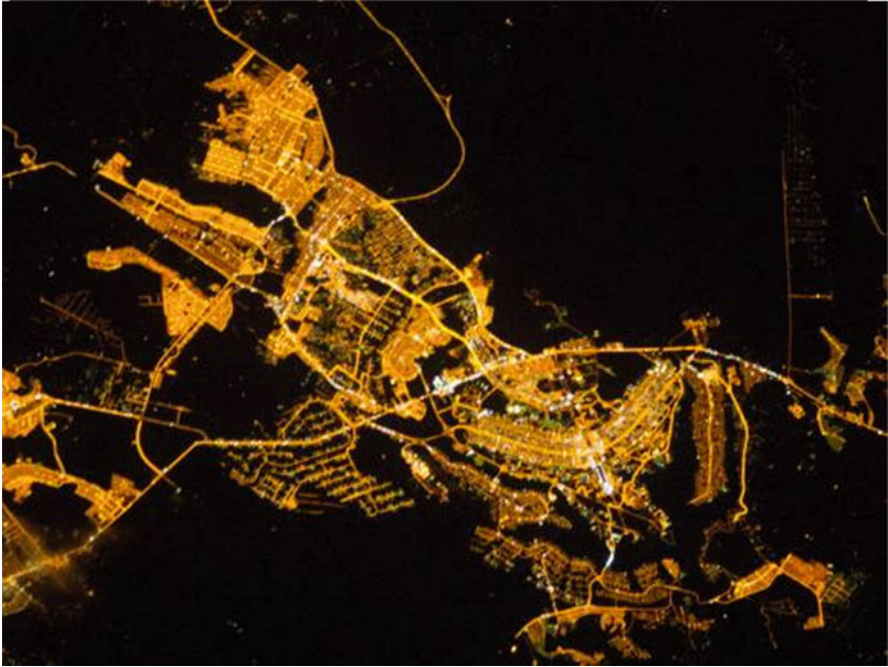**Fig. 10.13** Night image of Brasilia from space (http://earthobservatory.nasa.gov/IOTD/view.
php?id=48963)

Fig. 10.14 Typical neighbourhood in Brasilia (http://meredithinbrasilia.blogspot.com/2011/06/
images-of-our-soon-to-be-neighborhood.html)

Fig. 10.15   The huge central axis in Brasilia (Photo: Rob Roggema)

'flow' underneath the buildings. This, supposedly, was designed to give the city an open and transparent character.

The most spectacular part of the city is undoubtedly the central axis (Fig. 10.15), which forms the body of the bird and alongside which all government buildings are found. The enormous dimensions of this axis do let the building look like regular sized ones, but in reality each of these buildings are multi-storey buildings of respectable sizes. The length of the central part of the axis alone is approximately 3 km, a distance not easily walked, especially not while crossing busy traffic on wide roads and wandering through a completely open space.

Brasilia houses many iconic buildings (Fig. 10.16). Most of them are located next to of near the main axis. The buildings are positioned as single buildings in wide-open spaces, allowing the building to make an impression. Because of the large size of the buildings they are placed much further away than expected. Oscar Niemeyer designed many of these buildings.

Brasilia is as a city to live in not very popular amongst government officials. Everyone who could afford it leaves the city during the weekends for better places, along Brazil's coast. This leaves many of the poor behind in the city, leading to Brasilia's favelas developing at a distance (approx 30 km) from the city. The large public spaces are difficult to maintain and many of these areas are no-man's-land. The huge distances require a car. Public transport or bicycle use is underexploited and the city could increase its densities through infill projects in the vast, unused open spaces.

Brasilia's climate is hot and humid, especially in summer. This imposes a high rate of air-con use. There are not too many trees, so shade can only be found under the buildings, where anonymity and criminality reign.

Fig. 10.16 Iconic buildings in Brasilia: Supremo Tribunal Federal and Memorial JK (Juscelino Kubitschek), both designed by Oscar Niemeyer (Photos: Rob Roggema)

10.2.3 Almere, The Netherlands

The city of Almere, in the Netherlands is built, started in the mid-1970s, in one of the Dutch polders, land reclaimed from the sea. Almere was designed as a poly-nuclear city, consisting of several urban districts (Almere-Stad, Almere-Haven, Almere-Buiten, Almere-Hout, Almere-Poort) which are separated from each other by robust green structures (Fig. 10.17). This causes an urban pattern of widespread developments. For instance, the distance between the northernmost and southern-most freeway exit is 13 km, for a city of nearly 200,000 inhabitants a long way.

Fig. 10.17 Almere city from the air (http://farm5.staticflickr.com/4126/4967385433_e97c1f2a0b_z.jpg)

Because distances between urban parts are large, car dependency is huge. At a close distance from Amsterdam it serves as the major residential area for the capital. Because many Almerians still work in Amsterdam, this causes a major traffic problem, especially because everyone needs to cross in mornings and afternoons a single bridge connecting the polder with the mainland.

The layout of Almere was originally based on two interfering systems: the urban design principles and the traffic network (Stassen 2001). The fine mazes of the urban design, with repetitive turns in the urban pattern of 45°, allowing for a fluent, unconscious flow from outside neighbourhoods towards the city centre. The traffic system was designed in a hierarchical way, starting from the freeways up to the individual streets. Super-positioned over this traffic system, the free-lying bus-lanes are realised, providing safe and fast public transport around the city. Later, the urban design became more linear (especially in Almere-Buiten and later phases of Almere-Stad), reflecting the underlying rationality of the polder. In the design for Almere, there is no 'central axis' or other spatial mega structure included. However, the architectural richness both elaborated in iconic buildings, such as for instance in the renewed city centre (Fig. 10.18) as in the design for the many individual homes, is unequalled in the country.

The vast majority of the houses in Almere are attached low-rise buildings, with entrance at ground level. The streets are neatly designed as coherent ensembles with architectural attention to the buildings and streetscape (Fig. 10.19). The houses all have a small garden in the front and a larger garden at the back. The pace of urban development in Almere is respectable. In many years of the past two decades the

Fig. 10.18 Iconic buildings in Almere, The Wave, by René van Zuuk Architects (http://www.e-architect.co.uk/holland/block_16_almere.htm) and Popzaal 2004 by Wil Alsop (http://straatkaart.nl/1315SB-Schipperplein/media_fotos/almere-centrum-Eyz/)

'production' of newly built houses was around 3,000 houses per annum. It has led to a population, which will soon top 200,000 people and it is expected to grow further to 350,000 inhabitants (Gemeente Almere 2009).

The Dutch climate is not very extreme and predictions will not lead to extreme disasters. Temperature will stay moderate (average highs 20–25 in summer, and zero–5° in winter) and despite the fact that relatively more intense rainfall is expected in summer, this will not lead to huge flood disasters. The main real threat to the

Fig. 10.19 Typical streetscape in Almere: Almere Pampus (http://www.flickr.com/photos/hono-rata_grzesikowska/4586421398/) and Almere Buiten (http://straatkaart.nl/1339GP-Chamoisstraat/media_fotos/chamoisstraat-almere-buiten-1cY/)

country is sea level rise as much of the country is lying below sea level. Almere, built in a deep polder, is around 5 m below current sea level. It borders an artificial lake (the IJssel Lake), which is separated from the sea through a closure dam. This lowers the risk of flooding as result of storm surges, but should the dam fail, the city is at risk.

10.2.4 Canberra, Australia

The city of Canberra is Australia's capital since 1927. In 1908 the site was selected, diplomatically situated between Melbourne and Sydney. Walter Burley Griffin designed the layout as the winner of an international design competition. The designs main elements are considered the large artificial lake and the main axis (Fig. 10.20), which visually connects Parliament House and Anzac Parade. The city is widespread and distances are large, leading to car dependency, similar to the other planned cities. Its natural features of mountains and forests are surrounding the city neighbourhoods.

Canberra hosts several iconic buildings, of which Parliament house and the National Museum of Australia are the most famous ones (Fig. 10.21).

Fig. 10.20 Main axis in the design for Canberra (http://www.agd.com.au/directory.php?dirpage=search&act=search&region_id=&cat=000084&keywords=&alpha_search=N)

Fig. 10.21 Iconic buildings in Canberra, National Museum of Australia (design: Howard Raggatt) and Parliament House (Mitchell/Giurgola Architects) (Photos: Rob Roggema)

The majority of neighbourhoods consist of suburban 'sprawl'. Detached houses are placed in lush and spacious patterns, with broad streets, green spaces and lots of trees (Fig. 10.22).

The climate of Canberra in winter is, due to its location in a mountainous environment, relatively cold and it can easily freeze. In summer however, temperatures rise and it can become very hot. In periods of longer droughts, combined with the abundantly available green and forests, Canberra is vulnerable for bushfires, as the most recent occasion in 2003 has shown.

Fig. 10.22 Typical streetscape in Canberra (http://treelogic.com.au/facts/2010/09/ageing-tree-avenue-management/, http://www.hotkey.net.au/~krool/photos/act/canberra.htm)

10.2.5   Communalities

The four cities that were planned from scratch share some communalities.

The first observation is that insiders are all very satisfied with the living conditions in their city. This information, only from hear-say, has been obtained listening to

stories people have told about their cities. Except for Brasilia, people are happy and do not want to switch to another residence.

Secondly, the cities are in their design over-dimensioned. Sometimes in the form of (too) broad roads, enormous public spaces or long distances to travel from one end of the city to another. In several examples the idealistic enthusiasm to design the well-planned city carried away the designers. Especially the bigger buildings, requiring space around them to 'fit', lead to a scale in which human standards are in a sense set aside in favour of the overall picture. As humans you are little compared to the buildings around you, and to walk the city distances are always longer than you think.

As a result of this, and perhaps because these cities were designed in an era oil became abundantly available and the car was the mean to empower and mobilise large parts of the population, the four examples are all very car-dependant. The designs take the car and its requirements (road widths, parking space, long distances) as the prioritised element.

Thirdly, the Masterplans all became icons of good city planning. Due to their conceptual strengths, being central axes, grid patterns or poly-nuclearity, and being designed by some of the most famous architects and city planners, these cities are known all over the world. The emphasis on city planning subsequently, or in some cases parallel, led to increased attention for architecture. In all four examples innovative and iconic new buildings are designed and realised.

10.3   Best *Sustainable* Cities

The sustainable city, as can be expected, tries to create cities that are sustainable. Sustainability used to be a single goal issue, namely to create an environmentally better situation. This early awareness of sustainability was necessary because pollution was a threat to the lives of many people. Cleaning the soil, water, minimising air pollution or traffic noise were high priorities in those days. In the modern time the approach is holistic and many aspects of city development are integrated in a sustainable approach. Five components of a sustainable city are distinguished (Kassenaar 1994): ecological, socio-cultural, economic, spatial and infrastructural, and cybernetic components need to be sustainably integrated in the design of our future cities. Long standing examples, such as Curitiba and Freiburg as well as recent examples, such as Malmö and Masdar all pursue this goal of integration.

10.3.1   *Freiburg, Germany*

Freiburg was rebuilt after WWII and the city has chosen not to put the automobile central, but the pedestrians. This has led to streets deliberately designed for pedestrians, and bike lanes and trams (figure 10.23, at the heart of the city's development). Additionally, the unique Freiburg *Bächle*, small canals run down each central street.

Fig. 10.23 Freiburg City centre, crucial role for public transport and pedestrians (http://extension.
ucdavis.edu/unit/environmental_management/course/description/?type=I&unit=ENV&prgList=
GBD&course_title=Sustainability%20Abroad:%20What%20Can%20We%20Learn%20
from%20Europe%20and%20the%20Rest%20of%20the%20World?&CourseID=36562)

As a result of this choice of half a century ago, 70% of the locals walk, cycle or take
public transport (Fig. 10.23).

10.3.1.1   Traffic

Freiburg's traffic and transport policy gives preference to environment-friendly
modes of movement (pedestrian traffic, cycling and local public transport). The most
important objective of Freiburg's policy is traffic avoidance. This is achieved through
the design of a compact city, which can be crossed quickly with. Urban development
is directed along main public transport arteries and priority is given to centralised
development over peripheral growth. All major urban developments follow this con-
cept. As an example, the new city districts of Rieselfeld and Vauban are both easily
accessible by public transport, as are the inner-city university locations.

10.3.1.2   Solar City

With more than 1,800 h of sunshine each year and an annual radiation intensity of
1,117 kilowatts (kW) per square-meter, Freiburg is one of the sunniest cities in

Germany. Not surprisingly, Freiburg has been most successful in the field of renewable energy. Solar panels can be found on the roofs of the Badenova Stadium and the City Hall, on schools, churches and private houses, on facades and towers. It has led to unique projects, such as the world's first energy self-sustaining solar building, the Heliotrope, the solar village created by Rolf Disch, or the zero-energy houses of the Vauban neighbourhood. Even the local football stadium has become an attraction as the first stadium worldwide to have its own solar plant (Fig. 10.24).

These principles of traffic and solar are implemented in current urban developments, such as Vauban and Rieselfeld.

10.3.1.3   Vauban

The Vauban Quarter is located close to the city centre, and is an attractive, family-friendly neighbourhood, in which civic commitment, collective building, and living with ecological awareness has great importance. The following eco-characteristics are realised:

Fig. 10.24 Examples of the use of solar energy in architecture and building: The soccer stadium (www.solar-fabrik.de/fileadmin/user_upload/pressebilder/referenzanlagen/SC_Stadion.jpg), Solar fabric (http://www.worldchanging.com/archives/011173.html) and Vauban residential area (http://madisonfreiburg.org/green/vauban.htm)

Fig. 10.24 (continued)

- Low-energy building is obligatory in this district; zero-energy and energy-plus building and the application of solar technology are standard for most;
- The rows of old trees were preserved as much as possible;
- The green spaces between the housing rows account for good climatic conditions and provide play areas for children;
- Vegetation-covered flat roofs store rainwater, which is collected and re-used;
- The neighbourhood area is traffic-calmed, with the majority of households not owning a car;
- The residential area has been linked to the city tram system, enabling many people to do without a car, using local public transport or riding their bikes instead.

10.3.1.4   Rieselfeld

The neighbourhood of Rieselfeld combines a positive image, comprehensive public infrastructure and connected neighbourhood life. Civic commitment and proactive cooperation are important in this district. The following characteristics determine the neighbourhood:

- All houses are built as low-energy buildings. In many of them, photovoltaic panels and solar heating utilise the energy of the sun;
- Additional forms of renewable energy utilisation and district heating from a combined heat and power station complement the energy concept;
- A consistent water concept and consideration of climatic aspects;
- green spaces, playgrounds, open areas, bicycle paths and traffic-calmed streets where children are allowed to play are part of the urban design.

  Some of the key success-factors in making Freiburg a sustainable city are::

1. An integrated sustainable development vision
2. Support and consensus amongst all political parties on sustainability
3. Engagement and involvement of different stakeholders
4. Participation and commitment of citizens

Sources

www.citiesforpeople.net/in-freiburg-city-its-clean-and-pretty
www.citiesforpeople.net/freiburg-green-city-%E2%80%93-success-factors
www.ice.org.uk/topics/community/Sustainable-Community-Development/Freiburg

10.3.2   Curitiba, Brazil

"Cities are not the problem, they are the solution." is probably the most famous saying of Jaime Lerner, who is the (three time) former mayor of Curitiba and urban planner. Curitiba put this in practice, starting with its first Master Plan, dating from 1965, in which land-use, planning, traffic management and transportation are

Fig. 10.25 Bus lane and bus stop, Curitiba (Photos: Rob Roggema)

integrated and flexibility in regulations *is* maintained to allow for different future development scenarios. One of the central goals was to give all citizens access and this led to the guiding principle that mobility and land use cannot be disassociated. In concrete, the main transport arteries were modified over time to give public transport the highest priority. Each of the five arteries contains one two-way lane devoted exclusively to express buses, safe, reliable, and efficient (Fig. 10.25). About 1,100 buses make 12,500 trips per day, serving 1.3 million passengers. The result of this intensive bus use, Curitiba's gasoline use per capita is 30% below that of eight comparable Brazilian cities it has negligible emissions levels, little congestion, and an extremely pleasant living environment.

Along the five structural arteries high density development is encouraged (Fig. 10.26). This has helped to divert transport movement from the city centre, allowing the transformation of city centre streets into a pedestrian network, which turned out to be a tremendous economic boost. There was much more space available for customers rather than vehicles, the shopping environment was more pleasant, and people had more time to shop when they did not have to drive and park.

The higher densities along central bus-routes go hand in hand with development of a large network of green spaces and parks. The green urban areas in Curitiba are among the largest in the world. The parks improve liveability, but they also are functioning to reduce flooding, rather than canals. Moreover, Curitiba protect local vegetation (mixed subtropical forest), which has been threatened by urban development. It makes sure that the Paraná pine (Araucaria angustifolia) is not felled in public or private parks. In order to protect the local vegetation, the city's Municipal Secretariat of the Environment produces 150,000 endemic cuttings, 16,000 fruit trees and 260,000 flower seeds, at the same time as 350,000 cuttings are nursed in a botanical garden and three greenhouses.

Fig. 10.26 High rise axes where public transport runs, determining high rise, low rise, ecological structures and recreational lakes (Photos: Rob Roggema)

The population of Curitiba has, among other things, planted 1.5 million trees along the city's highways and byways. Many streets in the city centre have been converted to pedestrian precincts and a 'flower street' is cared for by street children.

Curitiba's 'Open University' provides an education for a modest fee, and the city's inhabitants are taught about environment protection. Clapped out old city buses are used as mobile schools which teach the population about sustainability.

The city has succeeded in introducing a Green Exchange employment program. Low income families living in the favelas, shantytowns out of reach of the city's dustcarts, can exchange their rubbish bags for bus tickets and food. Children can

exchange reusable waste with school articles, chocolate, toys and tickets to entertainment events. The project results in less household waste in the streets as well as in sensitive areas such as rivers and parks. In combination with other initiatives, 70% of Curitiba's waste is recycled by the city's inhabitants. The city's recycling of paper alone accounts for the equivalent of 1,200 trees a day.

The long-term consecutive work on the execution of the first Master Plan has made Curitiba one of the most sustainable cities. This can be emphasised by the following:

1. Curitiba has the highest recycling rate in the World – 70%.
2. Curitiba has bus system that is so good that car traffic decreased by 30% while the population trebled in a 20 year period.
3. Curitiba has the largest downtown pedestrian shopping area in the World.
4. Curitiba has built large numbers of beautiful parks to control floods rather than concrete canals. So many that they use sheep to cut the grass as it's cheaper than lawnmowers.
5. Curitiba is a city where 99% of inhabitants want to live. In comparison, 70% of Sao Paolo's residents want to live in Curitiba.
6. Curitiba's average income per person has gone from less than the Brazilian average in the 1970s to 66% greater than the Brazilian average.

Sources
www.citiesforpeople.net/cities/curitiba.html
http://sustainablecities.dk/en/city-projects/cases/curitiba-the-green-capital
www.dismantle.org/curitiba.htm

10.3.3 Malmö, Sweden

Malmö's WesternHarbour (Västra Hamnen) has become the city's most famous district in terms of integrating environment and energy in urban planning. WesternHarbour was an old polluted shipyard, which closed a few decades ago leaving 6,000 people without jobs. But Malmö saw the area not as a problem, but as a solution for the need of a beautiful new part of the city, which would inspire a new environmental, economic and social miracle in Malmö.

The 175 ha artificial island of Västra Hamnen was bought by the Municipality of Malmö in 1996, and the idea was to develop an entirely new eco-district. Over the last 10 years, the municipality has transformed the island from a polluted industrial area to an environment-conscious district with homes, businesses and recreational areas. A fundamentally sustainable approach to planning has been key in the creation of the district with visionary dwelling-types and high-quality permanent housing solutions, architectural diversity and urban spaces where people, aesthetics, ecology and technology merge. It has been highly praised as an exciting, ambitious and thought-provoking success, and the people of Malmö have embraced the district, especially its harbour promenade.

Fig. 10.27 Water storage and bicycle paths in Malmo' Western Harbour area (http://spfaust.word-press.com/2011/02/25/city-of-sustainability-and-renewable-energy/ and http://www.ice.org.uk/topics/community/Sustainable-Community-Development/Malmo)

Sustainability also concerns interaction between the people who live in the area, and objectives have been laid down regarding different forms of ownership in order to reduce the formation of ghettos. Furthermore, design and architecture create aesthetically pleasing urban spaces and attractive places where residents can get together (Fig. 10.27).

This is manifest in such details as protection against the wind and pleasant outdoor areas with a good view and proportions to which residents can relate. In order to ensure a sustainable resource management and recreational and aesthetic values, water in the district flows through an ingenious system of ponds, open channels and moss-covered roofs (Fig. 10.28).

The energy performance of the area is very good as 100% is powered by local renewable energy. Consumption of resources is minimised e.g. by wind turbines, which provide all the electricity and solar panels on the roofs supply a fifth of the heat, the remainder coming from thermal heating and Malmö's existing, super-efficient district heating system. Recyclable and organic materials are sorted and contribute to energy production by the city's biogas plant. The residents are encouraged regularly to check their energy consumption on information panels installed in each home. In addition to this, paths and cycle tracks have been given high-priority as has the use of healthy materials in the dwellings and surroundings.

Additionally, local buses are powered by biogas from residents' waste, there are plenty of green spaces and cars can hardly be seen anywhere.

Interesting enough, not too many people who live there know about the environmental benefits. Malmö took the decision to sell the properties based on them being beautiful and in a beautiful area.

Sources

http://www.citiesforpeople.net/cities/westernharbour.html
http://sustainablecities.dk/en/city-projects/cases/malmo-bo01-an-ecological-city-of-tomorrow
http://www.ice.org.uk/topics/community/Sustainable-Community-Development/Malmo

Fig. 10.28 Ecological water treatment in public space (http://www.ice.org.uk/topics/community/Sustainable-Community-Development/Malmo and http://sustainablecities.dk/en/city-projects/cases/malmo-bo01-an-ecological-city-of-tomorrow)

10.3.4   Masdar City, United Arab Emirates

Masdar – Arabic for *the source* will be the world's first zero-carbon and zero-waste city, developed by Abu Dhabi, the Mubadala Development Company and the British architectural firm Foster and Partners and completion date is expected to be between 2020 and 2025.

Fig. 10.29 Masterplan for Masdar City © Foster + Partners (http://www.esri.com/news/arcnews/fall09articles/building-an-oasis.html)

The city will be built 17 km from downtown Abu Dhabi and will cover approximately 6 km². It will include several different renewable energy sources. The main source of power will be a 60 MW solar power plant, with plans for more as the city grows. Masdar is planned to be a sustainable, renewable masterpiece of urban design (Fig. 10.29).

It will be car-free and feature, a clean, efficient transport system. Furthermore, use of solar, geothermal and hydrogen energy will power, heat and cool the city and a desalination plant will provide fresh water. Within the limits of Masdar City, the plan is to include water treatment plants, recreational areas and sports facilities, recycling centres, sewage treatment plant, a wind farm, and plantations of different tree species producing biofuels. The ambition is to establish Masdar City as the

Fig. 10.30 Public squares as proposed in Masdar city, shadow combined with solar energy (http://inhabitat.com/foster-partners-carbon-neutral-masdar-city-rises-in-the-desert/)

world's first fully sustainable city, combining traditional planning principles with existing technologies (Fig. 10.30). The city aims to be innovator and pioneer in innovative sustainable technologies for energy, water, and waste management. Masdar City's aim is to show the extent to which cities can be sustainable, while offering world-class living and working environments, thereby changing the global landscape by showing what's possible.

The United Arab Emirates hope that Masdar will not only be a model for sustainable cities and renewable technologies, but also a haven for renewable energy companies, green energy technology research, development and investment, and carbon resource management.

Masdar City is planned to become a high-density, pedestrian-friendly (no cars are allowed) urban area where renewable energy and clean technologies are researched, tested and implemented. The project is inspired by architecture and urban planning of traditional Arab cities. The design incorporates narrow streets, shading of windows, exterior walls, and walkways, thick-walled buildings, and the use of local vegetation. Best practices in traditional urban planning will be combined with advanced practices and technologies in sustainable building. The use of fossil-fuel vehicles is minimised in the city. The design provides the highest-quality living and working environment with the lowest possible carbon footprint.

Upon completion the city will house 40,000 permanent residents and hundreds of businesses.

10.3.4.1 Masdar Plaza

One of the central places in the city will be Masdar Plaza, designed by LAVA (www.l-a-v-a.net/). As many cities across the World have shown, the plaza, forum, or square is the epicentre in the city, the place where life, values, ideals, and visions of the people evolve. The Masdar Plaza is designed as an *iconic beacon* attracting global attention to sustainable technology.

The Plaza is designed to be "the Oasis of the Future": a living, breathing, active and adaptive environment, where social interaction of people occurs, and the use and benefits of sustainable technology are spotlighted. The flexible use of space allows all functions to perform the highest quality of indoor and outdoor comfort and interaction.

Interactive, heat sensitive technology activates low intensity lighting in response to pedestrian traffic and mobile phone usage.

'Petals from Heaven' feature interactive umbrellas that open, provide shade, and capture energy during daylight hours; folding at night to release stored heat (Fig. 10.31).

Solar analysis provides insight into the tuning of facades in order to incorporate an ability to respond to varying sun angles and levels of solar intensity.

The Oasis of the Future has the ability to control ambient temperature at all times of the day. The 'Petals from Heaven' open and close. They protect pedestrians from the sun and capture, store, and release heat. They adjust the angle of shade based on the position of the sun. The heat sensitive lamps adjust the level of lighting to the proximity of pedestrians. The water features ebb and flow based on ground temperatures.

Sources
www.archdaily.com/33587/masdar-sustainable-city-lava/
http://blog.hotelclub.com/sustainable-city-masdar-united-arab-emirates/
http://oilprice.com/Latest-Energy-News/World-News/Masdar-City-The-Most-Sustainable-City-in-the-World-to-Open-in-2025.html
www.careers.ch2m.com/worldwide/en/engineering-projects/masdar.asp

10.4 The *Self-Organising* City

The third option to develop a best city is the opposite of a completely planned city, the city of not-aiming to control and plan and letting the city self-organise the future that over time will appear. There are many examples of these developments. Often, uncontrolled (by government) developments are seen as problematic, such as the Brazilian favela's (Fig. 10.32) and African or Indian slums (Fig. 10.33). Several characteristics, such as criminality or rule less practices may underpin this, but in terms of developing urban patterns these settlements can also be seen as very successful.

Fig. 10.31 Masdar Plaza with its Petals from Heaven (http://thewondrous.com/masdar-city-photos-worlds-first-sustainable-zero-carbon-zero-waste-city/ and http://thewondrous.com/masdar-city-photos-worlds-first-sustainable-zero-carbon-zero-waste-city/)

Fig. 10.32 Favela in Rio de Janeiro (Photo: Rob Roggema)

Fig. 10.33 Self-organising slums in Delhi (Photo: Rob Roggema)

10.4.1 Delhi, India

Taking Delhi as an example, and not ignoring some of the serious problems, a couple of principles can be distinguished that illustrate its self-organising capacity.

First of all, the traffic system is, from an outsider perspective, often characterised as chaotic, a mess or worse. However, when driving around for a week in the city three self-organising principles, which clearly provide a logical, understood and safe traffic system:

1. Look only and always at everyone that is in front of you, no matter if it are cars, buses, trucks, bicycles, pedestrians, cows or adverse traffic;
2. Change course slowly, at moderate pace, giving fellow users time to adapt and change their course slowly;
3. When your neighbour comes too close to you, horn.

These simple rules everyone knows, understands and applies determine the functioning of the complex adaptive traffic system in Delhi. It provides a safe system, where hardly any accidents occur.

Secondly, self-organisation is represented in building patterns of seemingly unplanned urban areas. There are clearly no building regulations or design rules put in place, but still, identical patterns develop everywhere. Analysing the route between Delhi and Agra, nearly all settlements along the route developed similar principles. There is a complex system of narrow streets, connected in surprising and unexpected angles, and many different building types and –heights, in the *urban background*. In front of this there is the *business edge* (Fig. 10.34), where all types of business take place. This zone, which changes during the day and night, is always active and lively and contains many different activities (play and leisure, food and drink, mechanics and traffic requirements, etcetera).

The third zone is the *main traffic area*, where fast and slow traffic mingles and the self-organising principles, as described before, dominate.

Together the three zones form the urban fabric, developed according local demands and principles. In its functioning, adaptability and urban patterns it is very sustainable. However, environmentally the sustainability of these areas can be severely questioned.

10.4.2 Cairo, Egypt

Another example of how unplanned self-organisation developed urban pattern can be found in Cairo. During the uprising in the Egyptian capital the Tahrir Square (Fig. 10.35) became the centre-point of activities, unrest and military intervention.

The people gathering on the square were not randomly occupying the space. They deliberately self-organised themselves by creating all necessary functions on the square (Fig. 10.36) that an ordinary society would plan for in a neighbourhood.

"First of all, they took over a nominally public space, which the state wished to exclude them from access to, Tahrir Square. Having taken it over, and affirmed that

Fig. 10.34 Self-organising patterns at the edge of neighbourhoods between Delhi and Agra (Photos: Rob Roggema)

they wouldn't simply go home at the end of the day – something we might want to think about – they saw off wave after wave of assault on the protests, from police and plain clothes thugs. They set up committees to keep watch for government men…. They set up a network of tents for people to sleep in…. There are toilet arrangements – no small logistical matter when there are routinely hundreds of thousands of people occupying the capital's main intersection. They rig up street lamps to provide electricity. They set up garbage collection, medical stops – they occupy a well-known fast food outlet and turn it into somewhere that people shot at or beaten by police can get treated. They set up a city within a city, and collectively coped with many more challenges than the average city would have to face in an average day" (Seymour 2011, cited in Newman 2011).

Fig. 10.35 Tahrir Square, Cairo, Egypt (http://www.ryanlyford.com/myblog/2009/08/ryan-goes-to-frankfurt-cairo/20090705_cairofrankfurt-011/ and http://cairo.neighborhoodr.com/)

Fig. 10.36 Self-organisation patterns resulting from collaborating occupants at Tahrir square (http://www.mumbaishianews.com/2011/02/tahrir-square.html)

10.5 The *Best* City, Delhi Designs for Hobsons Bay

What happens if you place 16 very smart post-docs with different backgrounds in a design charrette environment for an afternoon, and ask them to design their best city? This is what happened during the Indian National Training Program week on Climate Change (Roggema 2012) in Delhi. The students were exposed to four cycles of design work. Three thematic sessions about water management, ecology and coastal protection

respectively, were followed by one design session focusing on integration of the themes. With thematic sessions lasting for 25 min and the integration for 45 min the afternoon functioned as e real pressure cooker, which forced the participants to stretch beyond their normal kills. On top of the time constraint came the fact that the chosen case study area was Hobsons Bay, a typical, coastal, Australian suburb in the western part of Melbourne's Metropolitan area, a real novelty for the Indian students. Three very inspiring designs came out of this intensive process: Gagan City, GEO City and Cloud 9.

10.5.1   Gagan City

The design for Gagan City (Fig. 10.37) is based on the underlying principle "Ecologising the urban area and urbanising the water". The water management on land is improved through the creation of new reservoirs in higher lying areas, where the water is stored before it can cause a flood. These new reservoirs are connected with each other and with the existing creeks through a new canal. The canal and the new storage possibilities increase the capacity of the system and make it possible to exchange excess rainwater. Flash flooding is prevented from happening. Excess water is diverted to new harvesting storages where clean water is kept in order to make it available for usage. The locations for these new reservoirs are found in currently unused spaces.

The coastal zone, bound inland by a new withdrawn seawall, is transformed in a broad vegetation zone, creating a new resilient protection area. Where houses exist new wetlands are integrated in current public green space and infrastructure, leading to an urban landscape of houses standing in the middle of a green and wet environment. The parts of the coast without current housing transforms in an area with vegetation and water, allowing for an easy migration of flora and fauna along the coast.

In front of the current coast a new structure is foreseen, providing additional coastal protection: the so-called sky-city. This is a surge barrier, which is open and can be closed when storm surges occur. The elevated bridge/barrier connects Point Cook with Williamstown and consists of a road system and the new sky city. This new city is a high- density city, fully autonomous in energy use: windmills are standing in between the houses on piers and each house is fitted with solar panels.

A final addition in the Port Phillip Bay is projected: the Gagan City International Floating.

10.5.2   GEO City

The basic principle of GEO-City (Fig. 10.38) is to strategically intervene with sustainable measures: an *interventionistic* acupuncture approach. There are several specific interventions determined:

• Related to water management rainwater is stored in different ways: on rooftops, in water tanks and in wetlands. The harvested water will subsequently be used in parks for irrigation purposes;
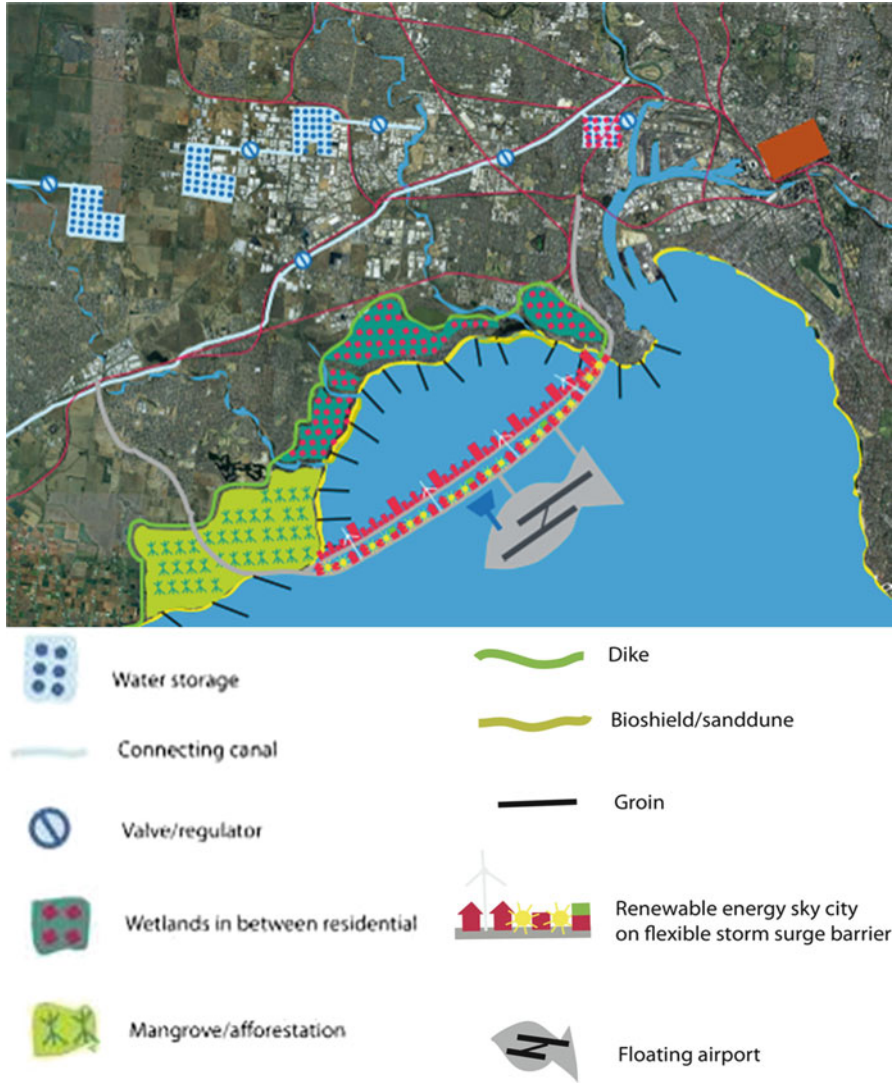
Water storage	Dike
Connecting canal	Bioshield/sanddune
Valve/regulator	Groin
Wetlands in between residential	Renewable energy sky city on flexible storm surge barrier
Mangrove/afforestation	Floating airport

Fig. 10.37 GAGAN City by J. Ansari, G. Girish, V. Mahale and M.P. Prabhakaran

- Industrial buildings will collect rainwater on their rooftops and in water tanks. Besides the water harvesting industrial buildings will be equipped with solar panels to collect energy;
- In parks and public spaces (streets) solar energy will be conserved and along the coastline windmills are projected;
- The residential buildings will incorporate different measures. Some building will have rooftop water storage, while others are provided with hanging gardens or prepared for flood resistance. The choice for a certain measure depends on the

location of the building. When the building can play a role in connecting ecological areas it will contain a hanging garden and where flood risk is apparent the building will be built to deal with that;

- Valuable habitats, currently isolated in the urban patterns are connected through green corridors alongside major roads;
- The coastal protection is arranged for through different proposals: the creation of strategically positioned artificial islands, floating forests, floating houses and an Aqua island, an artificial habitat in the shape of a fish. The coastline is changed into a mangrove forest, beautiful and resilient, but something completely different from Altona's beach shore.

10.5.3   Cloud 9

The emphasis of Cloud 9 (Fig. 10.39) is on creating a compact city, while preserving and creating more space for ecological and climate adaptation measures.

The water management system consists of three parts: the northern part where small dams store excess water in reservoirs, the storage areas in the urban areas and the overflow zone, where rainwater is let in the coastal wetlands. This area protects the land from washing away in the sea.

Fig. 10.38 GEOCity by Suman Lata, Priya Dutta, V. Rajesh Kumar and Ratheesh Kumar

Solar street light/waste water light

Green corridor, connecting similar habitats

Rooftop water storage

Hanging gardens

Sewage treatment plant

Funnel rain water harvesting

Solar energy conservation park

Pasture and woody vegetation

Artificial islands

Water conservation park

Floating houses

Aqua Island, artificial habitat

Tidal park

Flood resistant houses

Wind energy

Floating forest

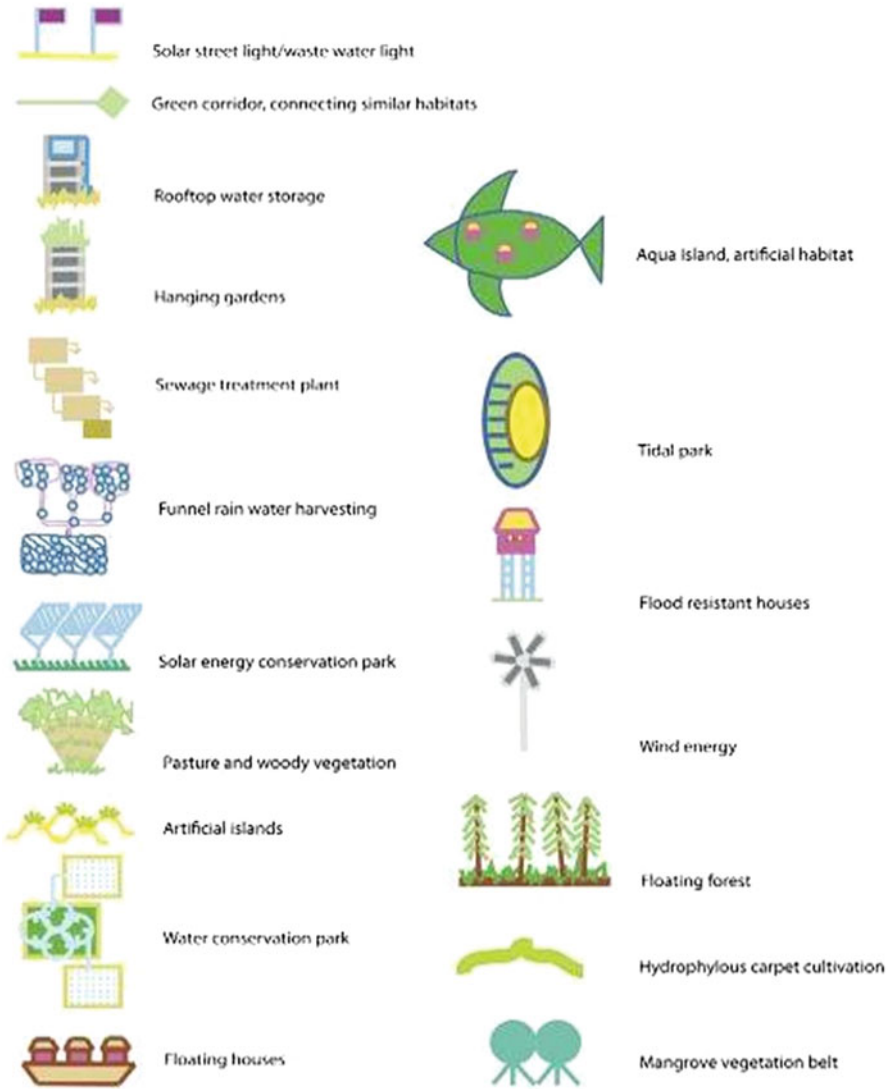Hydrophylous carpet cultivation

Mangrove vegetation belt

Fig. 10.38 (continued)

The ecosystem provides gradients of vegetation from the remote areas in the northern and western landscapes towards the more artificial habitats closer to the urban areas. The grasslands are ecologically developed through grazing cattle. In the urban environment the density is increased through introducing high-rise buildings, qualifying as green buildings in the existing neighbourhoods. The result of this is that an increased number of people can live in the area, but at the same time the amount of green, ecological, space is growing as well.

The land is protected from storm surges through a combination of measures: dense vegetation, wooden barriers, land reclamation, tide resistant barriers, a conventional seawall and floating islands protect the coast.

In conclusion, these three design proposals illustrate the broad variety of measures and interventions that transform the area as it currently is into a climate adaptive area, where biodiversity and ecological qualities are improved, through a variety of measures the coast is protected and a spectrum of water conservation measures the impacts of heavy rainfall are mitigated. Perhaps not all the proposals are immediately realistic, but many of the ideas can be implemented. The designs demonstrate that the existing urban area can transform into an ecological, sustainable and adaptive environment. Setting aside the extreme proposals, such as the floating airport, the designs show that small sustainable interventions and innovative thinking can make an impact, change the image of the urban environment and improve adaptive capacity. These ideas could (only) be developed in an environment of out of the box thinking was enhanced and participants were not hindered by existing policy, regulations or planning habits. The results of this intensive and very short design charrette demonstrated that innovative designs can be created, but is can also be read as a pledge for mutual design sessions, where different countries exchange their cultures and as a pledge for ultra intensive design meetings.
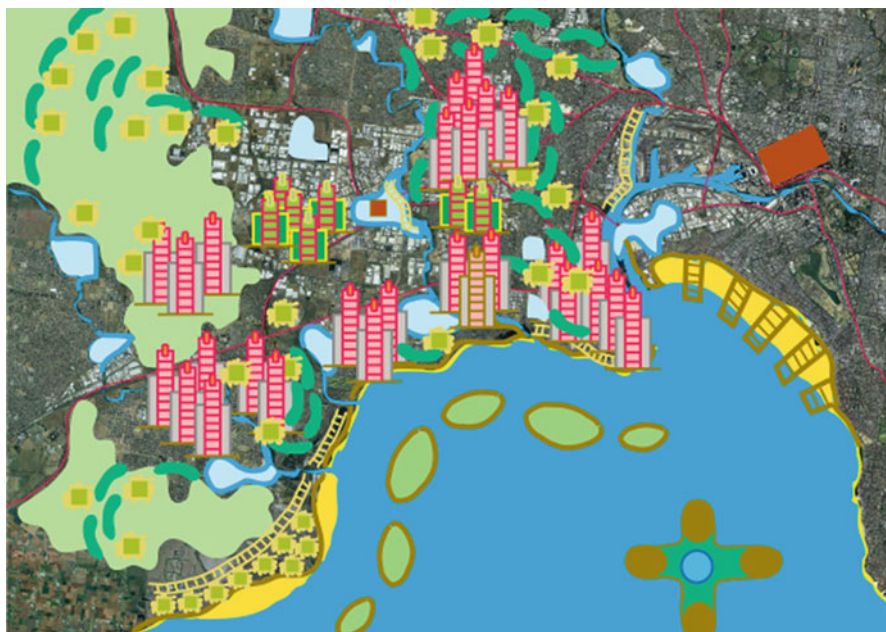

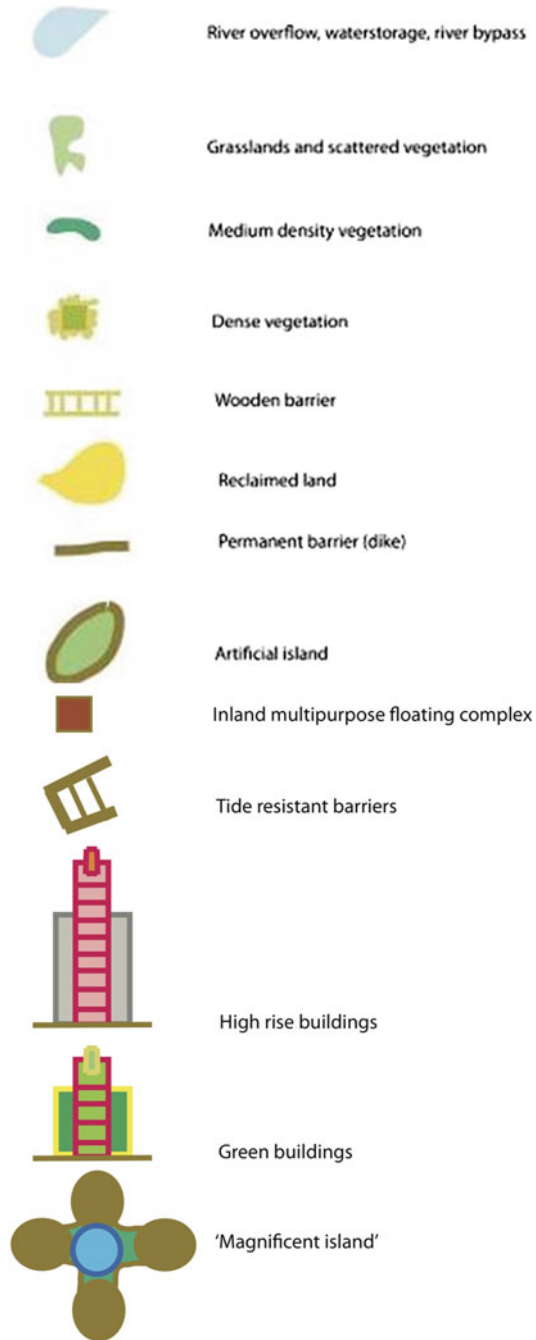**Fig. 10.39** CLOUD9 by A.K. Kanojia, Shakti, Japaechandra and Mohanty

River overflow, waterstorage, river bypass

Grasslands and scattered vegetation

Medium density vegetation

Dense vegetation

Wooden barrier

Reclaimed land

Permanent barrier (dike)

Artificial island

Inland multipurpose floating complex

Tide resistant barriers

High rise buildings

Green buildings

'Magnificent island'

Fig. 10.39 (continued)

10.6 The Art of Designing for Climate Adaptation

According to the Economist Intelligence Unit of the Economist Magazine, Melbourne is currently the most liveable city in the World www.eiu.com/site_info. asp?info_name=The_Global_Liveability_Report&rf=0. However, Melbourne Metropolitan Area is using vast amounts of landscape for residential living in low densities, is oil driven and uses huge amounts of fossil resources (e.g. coal for heating and electricity, oil for transport). The city is under threat of heat, bushfires, flooding as result of sea level rise and flash flooding due to torrential rains, all as result of climate change. It has a troubled public transport system with slow and mostly old trams, with cars obstructing their routes, and a train punctuality of 87%. For cyclists it is a risky ride through the city streets as car drivers don't see them or ignore their presence, often leading to accidents and cyclists being kicked off their bikes. These are some of the backsides of life in the most liveable city in the world. What it tells us is that *the* best city does not exist. There will always be elements that conflict with being the best. And it'll always depend on the standards used.

However, we can learn from examples of the past. Despite the fact that people are very satisfied in the *planned* city, it is too rigid. Despite the fact that the *sustainable* city is ecologically sound, it is too boring. And despite the fact that the *unplanned* city is organised by its inhabitants, it is too environmentally unsustainable. Even designs for the *best* city, despite being prepared for future climate impacts, are, in some parts, too extreme, or simply not good enough. Focusing on the benefits, the good sides of these examples might help to conceive a city that is flexible and able to adapt, and provides a safe and resilient place that challenges its inhabitants to shape their own, sustainable environment. To do some cherry picking from the different cities described before:

1. The learnings of the planned city were that on the one hand side a city is developed, which is highly appreciated by its inhabitants, but it is also seen as too rigid, with over-dimensioned public spaces and buildings. The city shouldn't be planned in each and every detail, but only the strategic interventions should be determined. The rest of the city, then, could be developed over time. Instead of a rigid framework in street patterns, which often made the mistake to be designed for cars instead of people, the spacious green and public spaces should be leading. Additionally, the beauty of exceptional architecture is an elements that deserves to be an element as part of a best city;

2. Learning from the sustainable city the ecological principles can be implemented and will function perfectly. However, in these cities the ideal society seems to live, as perfect citizens obeying the ecological rules, which is sometimes a bit boring and brave. Ecological principles derived from sustainable city and building theory could become an inextricable part of urban design, fully integrated. Moreover, sustainability topics should be very beautiful and could be hyped in order to challenge people to react and adjust. Could these measures provoke and seduce people to cross the line and to change the rules. Then, sustainability has become part of real life and the real city;

3. What has been learned from the self-organising city? There is enormous power in communities and societies to adjust their environment to their liking and requirements. Also, many communities are often constraint by rules, of which the purposes are unclear withstanding developments desired by the community. The backside of rule-less development is their environmental performance, which is often very low. Could self-organising power be combined with clean interventions, which creates a safe and pleasant city, it is beneficial for everyone. Some interventions located in the three zones distinguished in the self-organising city before are:

In the urban background public beauty-squares can be developed at strategic intersections and other points of importance. These squares can function as place to shelter in case of a disaster and as the provider of clean water, renewable energy and the place where dirt water is cleansed;

In the business edge beautifully designed delivery points can be introduced. Here clean water and energy can be retrieved and garbage can be brought in. When there are plenty of these points created they are easy accessible for everyone;

The main traffic zone currently a main polluter and this can be prevented if clean fuel, electricity and bio-fuels, is cheap and easy to get in frequently available filling stations.

4. The main learning from the Delhi best cities designs is that unexpected solutions and designs can be developed in a very short period, by people who are not constraint by existing rules and policies and lead to innovations. Not every single proposal is easily implemented, but the majority of ideas can and is capable of refreshing the minds of local policy makers.

In conclusion, the components of the art of designing for climate adaptation can be summarised in the following six actions:

1. **Analyse**: The design process starts with an analysis of the existing and logical developed networks. The networks determine future growth directions and potential new combinations of functions. Additionally the existing functional lay out of an area supports the network analysis;
2. **Focus**: Secondly, the main nodes in the spatial field are identified. These points are highly likely the places where new developments ignite. Here, the attractors can be found and 'it' all happens. When an intervention is done in these locations the entire spatial patterns will be influenced. It can be expected that spatial transformations will start from these nodes;
3. **Free**: Allow for a free development in the majority of the urban landscape. When rules are too rigid self-organising power is bound and will not create a strong resilient urban system;
4. **Plan**: Put a strategy in place to plan the unplanned. A strategy for including climate adaptation measures consists of three types of measures: (1) start with the inevitable (decisions already taken and cannot be withdrawn). This leads to the starting point, drawn on a map; (2) add no regret measures (being the strategic points) and other measures that are always beneficial, no matter what the future might bring, such as extreme weather events; and (3) add space for reservations to accommodate the unknown;

Fig. 10.40 A tale of two cities (Billard Leece Partnership Oty Ltd.)

5. **Release**: When major interventions are identified and implemented the control over execution, the spatial layout or the future needs to be released. A new spatial layout can only evolve when there is no control over the long-term and in great detail;

6. **Check-up**: The intended future, as determined by the strategic interventions in key nodes and the enhancement of self-organising developments in other areas needs a regular check-up. It could be that new key nodes and networks are developed over time. This may offer an opportunity to create a new intervention. When these regular check-ups need to take place is unidentified. This depends on the pace of general changes (in economy, demography, climate, culture, politics).

The best city doesn't exist. However, designers, planners and futurists will continue to design their Utopias. As the Tale of Two Cities (Fig. 10.40) illustrates, the fantasy of Modern Utopians is rich. This second cities assesses all building and design proposals on their sustainability, providing information on a continuous renewal and recycling of the city. This example is one of the 17 new Australian urbanisms, that reinvent the city and create a better, more sustainable world (Gollings et al. 2010).

References

DiChristina M, with editors (2011) Street-Savvy, Meeting the biggest challenges starts with the city. Scientific American, September 2011, pp 26–75

Eaton R (2003) Ideal cities: Utopianism and the (un)built environment. Thames & Hudson, London

Gemeente Almere (2009) Summary draft structural vision Almere 2.0. Almere: gemeente Almere. http://english.almere.nl/local_government/almere_2.0

Gollings J, Rijavec I, Bremner C (2010) Now and when Australian urbanism. Australian Pavilion 12th International Architecture Exhibition la Biennale di Venezia 2010. The Australian Institute of Architects, Canberra

Kassenaar B (1994) Ideeën voor een duurzame stad; het geval Amsterdam. Milieudienst, Amsterdam

Logan GM, Adams RM (1989) Thomas More: Utopia (Cambridge, Cambridge University Press).

Neuwirth R (2011) Global bazaar. Scientific American, September 2011, pp 42–49

Newman S (2011) Postanarchism and space: revolutionary fantasies and autonomous zones. Plan Theory 10(4):344–365

Ratti C, Townsend A (2011) The social nexus. Scientific American, September 2011, pp 30–35

Roggema R (2012) Design of a climate adaptive Hobsons Bay. Hands-on training. In: Proceedings "Climate change and geospatial technology". National Level Training Program. CSIR-NISCAIR, Delhi, India

Seymour R (2011) Towards a new model commune. Lenin's tomb blog: http://leninology.blogspot.com/2011/03/towards-new-model-commune.html. Accessed 8 Nov 2011

Stassen B (2001) Bedacht en gebouwd, 25 jaar Almere-Stad. Almere, Gemeente Almere, Dienst Stedelijke Ontwikkeling

Websites

http://blog.hotelclub.com/sustainable-city-masdar-united-arab-emirates/. Accessed 20 Feb 2012

http://oilprice.com/Latest-Energy-News/World-News/Masdar-City-The-Most-Sustainable-City-in-the-World-to-Open-in-2025.html. Accessed 20 Feb 2012

http://sustainablecities.dk/en/city-projects/cases/curitiba-the-green-capital. Accessed 20 Feb 2012

http://sustainablecities.dk/en/city-projects/cases/malmo-bo01-an-ecological-city-of-tomorrow.
    Accessed 20 Feb 2012
www.archdaily.com/33587/masdar-sustainable-city-lava/. Accessed 20 Feb 2012
www.careers.ch2m.com/worldwide/en/engineering-projects/masdar.asp. Accessed 20 Feb 2012
www.citiesforpeople.net/cities/curitiba.html. Accessed 20 Feb 2012
www.citiesforpeople.net/cities/westernharbour.html. Accessed 20 Feb 2012
www.citiesforpeople.net/in-freiburg-city-its-clean-and-pretty. Accessed 20 Feb 2012
www.citiesforpeople.net/freiburg-green-city-%E2%80%93-success-factors. Accessed 20 Feb 2012
www.dismantle.org/curitiba.htm. Accessed 20 Feb 2012
www.eiu.com/site_info.asp?info_name=The_Global_Liveability_Report&rf=0. Accessed 5 May
    2012
www.ice.org.uk/topics/community/Sustainable-Community-Development/Freiburg.   Accessed
    20 Feb 2012
www.ice.org.uk/topics/community/Sustainable-Community-Development/Malmo.   Accessed
    20 Feb 2012
www.l-a-v-a.net/. Accessed 2 May 2012