PORGMUN Research Paper

Improving Living Conditions in Cities and Minimizing Their Effects on the Environment through Sustainable Urban Planning

In 1348, the Emperor of the Holy Roman Empire, Charles IV started an unprecedented plan of Prague's expansion within the borders of the Old Town. His aim was to beautify Bohemia's capital so it could compete with the rich German and Italian cities. Up to the present day, the historic center is regarded as a supreme manifestation of medieval urbanism. During the 650 years, the needs of people have changed significantly. It is the main task for architects and politicians of the 21st century to keep up with the times and to optimize cities for our everyday lives.

Compactness

Breaking out of the old borders, walls, boulevards, and administrative limits which set it apart, the city has massively invaded the open country. Population density of mega cities descends considerably every year. For instance, in case of Bangkok, it has been by 3 % during the last year. This has many logical consequences. At first, people tend to commute more. 8% of workers in American cities have to travel more than 35 miles to arrive to the city where they work. Of the 61.6 billion commutes to and from work each year, just under one out of every 200 trips is a "stretch commute". Sadly, 96 % of these are realized in a car and approximately three quarters of

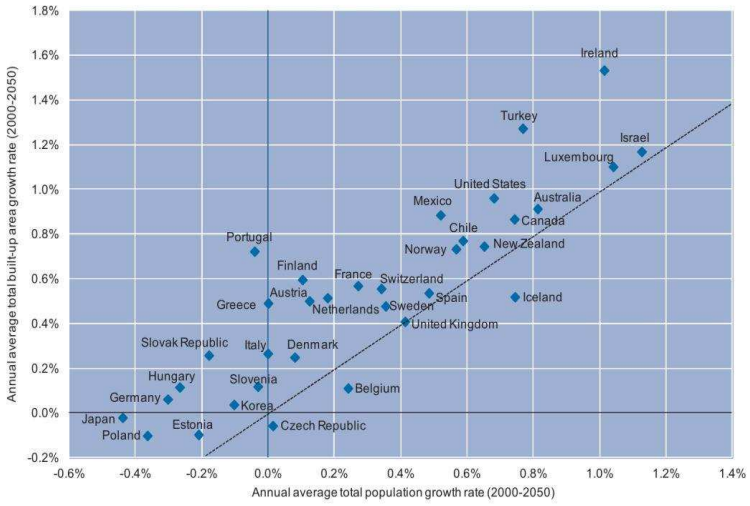

Figure 1: Population and built-up area growth rate in OECD countries, 2000-2050

the world’s commuters drive alone in their vehicle. Another alarming fact is, as research done by New York and Princeton University estimated, the land consumption for developed areas is going to increase more rapidly than the population in 30 out of 34 OECD countries. (See Figure 1) Hence, one of the most important qualities a modern city should aim to have is compactness. This has various advantages:

1. It shortens intraurban travel distances. This should provide less pollution from cars and higher productivity due to the shortened travel time for workers.
2. More efficient public service delivery. This contributes to urban sustainability by lowering infrastructure investments and cost of maintenance.
3. Better access to a diversity of local services and jobs. This greatly increases the quality of urban life and therefore attracts a skilled labour force. Greater productivity due to more diversity, vitality, innovation and creativity is expected as well.
4. Opportunity for urban-rural linkage. This should conserve farmlands and natural biodiversity and provide a wider variety of recreational activities.

Public Transportation

A reasonable system of public transportation is a prerequisite for every sustainable urban area. Sometimes, it can also fully determine the direction of growth. Excellent examples are Stockholm and Copenhagen (see Figure 2). In both of these instances, corridors for channeling overspill growth from the urban centers were defined early in the planning process, and a rail infrastructure was built, often in advance of the demand, to steer growth along the desired growth axes. Due to smart changes, Stockholm's transit modal share is nearly twice of what can be found in bigger rail-served European cities like Berlin and even higher than inner London's market share. Perhaps most impressive, cities with growth determined by public transport net are of the few places where auto-mobility appears to be receding. According to C40, there are several ways to improve transport in cities:

1. Promoting walking and cycling
2. Reducing the use of private vehicles
3. Reducing the carbon intensity of private vehicles

It should be mentioned, that the survey mentioned above concluded that cities who reported the most transformative actions found a small amount of district-based redesigning, suggesting that the most efficacious actions tend to be delivered mainly on a citywide scale.

An enormous effort has already been spent on realizing the first of the points mentioned above. The most common action taken is installing dedicated cycle lines and the improvement of pedestrian crossings as well as cycle sharing and hiring programmes. It is of great importance to note that banning or hindering car purchases is not the optimal way, because having high levels of car ownership in a city surprisingly doesn't result in high levels of car use compared to other modes of transport.

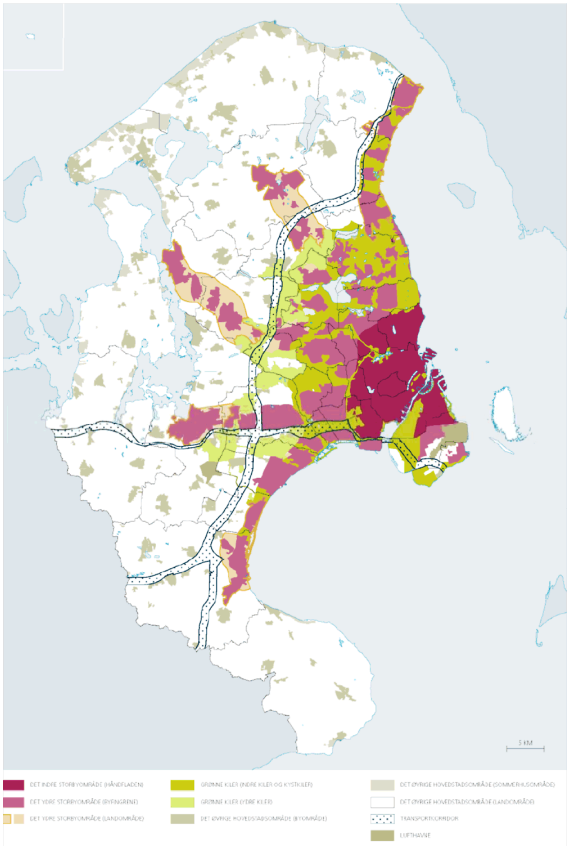

Figure 2: Population density of Copenhagen

Waste

A high volume of waste generated by cities and disposed of in urban landfills is a non-negligible driver of global GHG emissions. Methane released during waste decomposition is more than 20 times more powerful than carbon dioxide as a greenhouse gas. Ironically, just around half of actions taken by megapoleis so far have truly been systematic. One should consider the fact, that mayors exert more power over waste management than any other sector of their competence. On the other hand, cities' budgets in this area tend to be rather out of control.

The solution of problems with waste is divided into three parts: reduction, collection and treatment. The variety of interventions made all over the world is enormous. Starting with waste collection fees, outreach and

informative programs, disincentives and bans on certain waste, reducing packaging and not even finishing with the "Pay as you Throw" system.

Water and Air Pollution

As you read this, there have already been 6 billion tons of CO_2 produced since the beginning of this year. It is highly unsatisfactory that half of the urban population is exposed to air pollution that is at least 2.5 times higher than the levels World Health Organization (WHO) recommends – putting those people at additional risk of serious, long-term health problems. Immediate reduction of water and air pollution in cities seems to be absolutely crucial as there are currently 457 cities with a population over 1 million. In these urban areas, only 68 % of inhabitants are satisfied with water quality and 75 % of the population regard air quality as satisfactory. This does vary considerably throughout the world.

Cities show a strong preference for electro-mobility as a method for reducing the carbon intensity of motor vehicles, but there are few actions to reduce aviation emissions, although greenhouse gas emissions from aviation have risen by more than 80 % in last fifteen years. A research of C40 surprisingly showed no dependence of air pollution to the city's GDP. According to newest surveys, 99.5 % of German population lives in places where air pollution is greater than WHO's limit compared to 100 % in Iran. The reason for this fact could be, that, as UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) claims, the population of richer cities grows faster than in the poorer ones by a great deal. This rapid increase causes that MDC cities are in a similar situation as the LDCs, despite being armed with more efficient methods of tackling the problem of water supply and sanitation.

It is very alarming, that only 76 % of African citizens living in cities have access to clean water. Moreover, as United Nations Department for Economic and Social Affairs (UN DESA) highlights, an increase in the use of drinking-water resources is barely keeping up with the urban population growth. Millennium Development Goals (MDG) target 7c also calls for the reduction by half of the number without sustainable access to safe drinking water and sanitation. It shouldn't be neglected, that residential water use represents more than half of the water use across C40 cities. Leakage-loss-rates of 50% are not uncommon in urban distribution systems. In other words, some

250 to 500 million m³ of drinking water gets lost in many large cities each year. Saving this amount could provide an additional 10 to 20 million people with drinking water in each mega city.

High performance building

Every large city is formed by buildings. These have a substantial effect on our environment (For details see the graph). Development in this area seems to be quite satisfactory. The size of the U.S. green building market in 2005 was 10 billion dollars. In six years, this number rose by 620%. One could say that tackling such problems as usage of energy efficient materials and constructions practices, of energy efficient systems & equipment or use of renewable sources of energy and so on is an issue for architects. But in fact, there is a politicians' part as well. For most people, green building and affordable housing are not considered compatible. Should members of the UN support green housing financially? The main challenge to green building cited by most affordable housing developers is the higher initial capital outlay. However, a report by New Ecology Inc. shows that total development costs for green projects reviewed for the report ranged from 18 percent below to 9 percent above the costs for comparable conventional affordable housing. Does this mean that people are just afraid of a new type of living and that only public awareness would help them understand how convenient green buildings are?

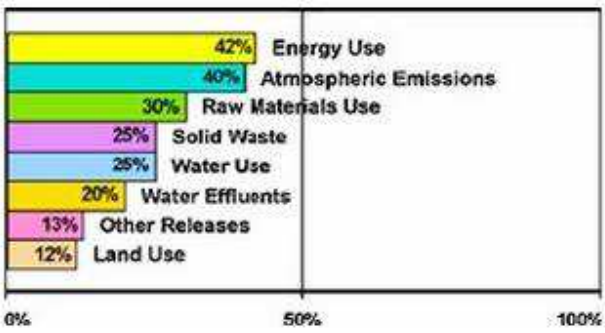

Figure 3: Effects of buildings on the environment

Green, affordable housing presents an opportunity to reduce variable costs, such as utility and transportation expenses, which disproportionately affect low-income people. According to a 2005 report by the Federal Home Loan Bank of Atlanta, in addition to lower utility rates, green building practices improve occupant health and comfort through the use of better ventilation systems and better construction materials.

Solution

Bear in mind that this is a complex problem. It needs global optimization. Neither waste collection fees themselves, nor reducing the use of private

vehicles itself can solve it. Furthermore, one should be cognizant of how enormous impact actions of the UN might have. Every single second, the urban population grows by 2 people. Your points of view should be consistent with the policy of your country. Particularly, a delegate's proposed solution will quite likely encourage members to intervene into the lives of their citizens and into the private sector imposing e.g. more efficient materials or technologies. It is an issue of a delicate balance, so think twice where it lies in your country. Please see useful links with further information enclosed.

Sources and Further Information

Statistics

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Figures

Figure 1: OECD; OECD Green Growth Studies Compact City Policies A Comparative Assessment: A Comparative Assessment
Figure 2: Naturstyrelsen (Nature Agency), Miljøministeriet (Ministry of the Environment) "Fingerplan 2007"
Figure 3: BERARDI Umberto et alli; Sustainable energy performances of green buildings: A review of current theories, implementations and challenges

Surveys and Research

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Literature

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