

The impact of over-urbanization on human and the benign interference on the architectural level

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Abstract. Development is a long-term process and the history of human progress is negligible compared to our mother nature. Now, human beings are at a stage of rapid growth, both civilly and economically. Negative impact is posed to society due to the rapid advance and this is also the major issue in the essay wanted to study on. Current circumstances caused by the different degree of urbanization are listed and some way of intervention using an architectural design that intends to reduce the effect of over-urbanization is provided in the article. Though research, the article has figured out the definitions of urbanization, the increasing amount of population transforming into the urban area accompanied by the growth in the economic level, and various influence caused during the process including environmental pollution, health issue and division of culture. The term over-urbanization is given to those severe circumstances, for instance, irreversible soil erosion. In this essay, possible interventions in architectural level, mainly biophilia, prefabricated buildings and old house renovation, are presented. The aim of those methods is to alleviate the influence of over-urbanization as much as the society can using existing materials and spaces with relatively low external cost. The essay wanted to present the current state of urbanization in the world and point out the severity of under-stated this procedure, while intended to found out effective ways using architecture design to modify over-urbanization.

Keywords: Urbanization; over-urbanization; biophilia; prefabricated; renovation.

1. Introduction

Development is a long-term process and the history of human development is negligible compared to our mother nature. Now, human beings are in a stage of rapid growth, both civilly and economically which means better and higher living conditions for people. However, every development process in the world cannot avoid the formation of a city, crowds of people, or buildings to create a system for trading or transformation in knowledge, better known as urbanization. This transformation speeds up material and information exchange but leads to mammoth drawbacks. In the early 20th century, due to quick urbanization and industrialization. London became the world-famous city of Fog. In recent years China, especially Beijing, was also suffering from the side effect, relatively high concentration of PM2.5, brought by rapid urbanization. Health issues showed up frequently among citizens of Beijing and even cause a slight reduction in the productivity of the working population. With more and more damage appearing in mortal society, the term over-urbanization was largely used and supported by the phenomena seen globally. This is an important problem that all people should pay heed to.

Even though incessant debates are going on based on this topic, most research was focused on changing the pattern of people living in a certain area since urbanization is the result of a huge flow of people moving into the city and the city cannot withstand such a big crowd that leads to over-urbanization. In this essay, possible strategies for addressing the problem by switching the residential environment of human beings are discussed. People live in buildings, and our lives are shaped by those architecture somehow. Architecture intervention may bring positive effects to reduce or slow down the process of over-urbanization but also remain the decisive characteristics of urbanization.

The main purpose of this study is to investigate possible intervention of architecture design in the process of over-urbanization and urbanization. To start with, the definition of urbanization and its feature will be presented. Then the concept of over-urbanization will be illustrated with its influence on society listed in three perspectives. Finally, the method of architecture design will be shown

including biophilia elements applied in buildings, prefabricated houses, and old house renovation. These solutions aim to put existing buildings and limited space into use and transform the old-style modern city with skyscrapers here and there into an urban space with a new arrangement. Some past examples will be necessary to demonstrate to support or strengthen the point indicated in the passage.

2. Urbanization

2.1. The definition of urbanization

With the growing development of human civilization, the world has experienced a tremendous transformation. From approximately 10 million years ago, the very beginning of human beings, to around 2 million years from now, when the sign of civilization gradually showed up within the group, the specie had gone through an extensive endless period. After being civilized, here comes urbanization. The increasing amount of population transforming into the urban area accompanied by the growth in the economic level is accounted as urbanization [1]. However, the term urbanization has multiple interpretations, for instance, the process of the rising number of infrastructure and increasing construction of modern skyscrapers that occupied natural environments or farmlands can be regarded as urbanization. Through this process, the area of rural areas decreases which means the population started to live in the city passively since most of the space is so-called cities now.

2.2. The performance of urbanization

The degree of urbanization is often standardized by the urbanization rate (percentage urban) which refers to the percentage of the number of people living in urban areas compared with the total population [2]. Take China as an example, the percentage of the borough in 1996 was 30.48% and boosted to 49.95% [3]. This represented the occurrence of the transformation from an agrarian society to a modern city. Secondly, more tall buildings appear in the region and replacing the natural environment. Farmland and forest are often replaced by building complexes which may cause further environmental issues. This is also regarded as the external cost of urbanization. Moreover, there will be some derived effects of urbanization which are mainly illustrated by the feature of the population. The average education level rises as well as the demand for a higher quality of living and work in conditions. This even leads to growth in the tertiary sector since people focus more on life quality and enjoyment. In addition, there must be an increasing number of industries and factories to meet the rising demand of people.

2.3. The reason for urbanization and the positive effect

The purpose of urbanization is irrefutable because human beings can be benefited from urbanization. People wanted to change the terrain to avoid or reduce the threat posed by the nature. From the preceding example around the globe, urbanization brought people together which indicated a more centralized society. In this case, urbanization made the management of local government achieve higher efficiency and is more suitable for economic development. Technology that can enhance productivity can be innovated better. Urbanization help promote the transformation from the first sector industry to second and even lead to development in tertiary sectors. To some degree, the show-up of urbanization can be explained better economically since this procedure appears to be a must for every county to convert from a developing nation to a developed state and there seems to be a direct proportional relationship between the level of urbanization and economic level [4]. Urbanization brought a larger working population, increasing output, and higher trading speed. Despite these, this movement is effective in raising the developmental level in the countryside. Communication is improved between rural and urban areas. Individually, with the rise in civil schooling levels, the prospect of living and working in a better environment has become more and more urgent. This also promotes urbanization.

3. Negative effects caused by over-urbanization

Over-urbanization is when the hormonal level economically for society cannot afford a considerable urban population [5]. In these circumstances, the expectation of people to an urban community is not able to reach and will even generate a series of issues in the society which may harm the development of the country and those negative influence can be discussed in different aspects.

3.1. Environmental influences

The trouble imposed on the natural environment due to the process of urbanization is often considered the largest and the most significant. This may not be the most intensive since all the damages can be seen. To illustrate, deforestation and land desertification which caused by the perpetual construction of skyscrapers and factories. Reclamation of land and replacement of original farmlands creates irreversible harm to the environment which destroys the ecosystem and habitat of animals. Furthermore, pollution like air pollution, and light and sound pollution has become some of the top issues influencing all living creatures. Apart from those impact on natural environment, the existing urban environment is also worsening. For example, traffic congestion happens frequently in cities like Beijing and Shanghai where are highly urbanized, often leads to inefficient geographic mobility that affect the society [6].

3.2. Physical and psychological influence

Following the environmental impact, humans' health is highly related to the surroundings they are in. In the past 2 decades, Chinese people have suffered from PM_{2.5} caused by rapid industrialization. PM_{2.5} refers to atmospheric particulate matter with aerodynamically equivalent diameters equal to and less than 2.5 microns [7]. Factories are built without any government intervention just to meet the surging demand for people. However, certain diseases especially respiratory issues presented frequently. Even worse, brain damage may occur if children were exposed under the circumstance of high concentration of PM 2.5. Mask was compulsory to survive during that period. Second, sound pollution produced by factories or frequent construction affected the normal routine of an ordinary person. Owing to increasing urbanization, people tend to move into the central area to get higher incomes for advanced living standards. Nevertheless, this generates colossus competition between people and converts into intense pressure. Producers also work to squeeze all the potential of workers which tend to impose work schedules almost 24/7. Humans suffering from long term pressure will lead to anxiety or even melancholia [8].

3.3. Cultural influences on building style

Since huge emigration from the country side to downtown, there will be a sudden alleviation of the population to pass on the traditional culture. For instance, Chinese youth mainly choose to work in a metropolis instead of remaining in their original village or town. This caused a little number of people to pass on some traditional craftsmanship. This inheritance symbolized the spirit of a nation which shouldn't be abolished in any way. Modern architecture is also extremely influenced by urbanization. Since people focus more on function, the modern style of architecture appears represented by the work of Le Corbusier which the architecture only serves a certain function and paid little or even no attention to the outlook. These works produced during rapid urbanization are similarly to goods produced on the assembly line that showed no sense of beauty. Architecture is meant to be a language and expresses its own story to the audience. If people stayed in those "modern buildings" for a long time, they must lose their passion for the world.

4. Possible interventions applying architecture design

4.1. The use of biophilic design

With increasing urbanization around the globe, human beings are suffering from a variety of destructive effects brought by this process. Most people nowadays inhabit an isolated system in which most compositions are man-made. From the view of the surroundings, it is difficult to cite any vegetation or even an area of clear sky since they are mostly blocked by buildings made of concrete and steel. The contemporary generation lives with artificial creation. To face this circumstance, the concept of biophilia gradually comes into our eyes. According to the definition described by the crowd, the term refers to the natural drive of human beings trying to draw a connection with nature as well as living creatures and the idea has also been applied in architecture and interior design [9]. However, this is not a lately new conception and can be chased back to the earliest human history when people make decorations representing animals, for instance, the Egyptian Sphinx. Moreover, use of biophilic elements can be found in public spaces and interior space like the bonsai placed in Japanese-style architecture and Alhambra sited in Spain. The designers are intended to create a link between mother nature and man-made living space. Through the combination of science and past experiences demonstrated by our ancestors, guiding nature into our daily life is essential to survival as an urban creature and predecessors had to sum up 14 characteristics of biophilia design [10]. Since a lot of countries around the world have previously achieved a high percentage of urban. The complete conversion of old modernist buildings into completely new ones using the concept of biophilia is difficult. The author believes elements like thermal and airflow variability, connection with the natural system, and non-visual connection with nature, which requires little or nearly no reconstruction implemented on existing architecture, may be a better solution to settle over-urbanization in current society. This can greatly minimize the cost of feasible intervention. To demonstrate, the goal of making a connection to the ecological system can be easily achieved by placing vegetation such as bracket plants into interior space. Besides, constructing with biological materials is a feasible method to apply biophilia in architecture. Since organic materials share similar properties as man-made materials, they have the potential to substitute current building choices.

4.2. Prefabricated buildings

Skyscrapers and tall buildings are already out of date since they are the production of the 20 centuries. No matter in function or the level of comfort, the traditional “modern style” of architecture can no longer meet the demand of today’s generation. As far as we see, safety seems to be a major issue for a tall building. The most well-known tragedy, 911 incidence happened in 2001, America, showed the possibility of certain buskin in skyscrapers. No matter for our comfort or safety, newfangled method of architecture should be considered. Mobility and diversification seem to be the leading trend for future architecture along with the ability to decrease the influence of over-urbanization. A prefabricated building is an erection competent to assemble and tear down easily. This type of construction is often famous for its high movability and feasible because it only has little or nearly zero restrictions in terrain and area. To strengthen, here is an example called tetra-shed, designed by David Ajasa-Adekunle. This design applied modular system with simple, small unit built up to a space in larger scale available for a range of diverse activities such as working, studying, entertaining. Moreover, the system is even suitable for public use including exhibition and classroom [11]. This type of mechanism might be a suitable way since it provides more chances to the composition of the city. The city may transform into flaky of blocks arrange in a variety of ways rather than isolated buildings standing here and there. In addition, the material used for prefabricated buildings is usually light and easy to assemble. This feature provides extreme mobility which can react to the changing society in a more rapid way. Since people live in architecture, mobile living space may lead to geographic mobility for the working population and lead to possible growth in GDP long term. Furthermore, the type of building requires no groundwork and are more environmentally friendly compare with past construction.

4.3. Old house renovations

Walking around the city, little empty space can be found in today's downtown, especially metropolis. If a switch from modern, stiff kind of urban architecture to a new construction style is necessary, it might be a better way to renovate old, existing architecture. To further the statement, in Shanghai, a prosperous, splendid city, where tend to be one of the most advanced urban areas around the world, remains crowds of poor old building hiding in the corner. For example, Hongkong district in Shanghai, where a large amount of the elderly lives in, architecture can even be chased back to 1940s. These blocks have extremely poor conditions as well as living condition below average, but occupied a huge proportion of land in downtown area. People are reluctant to live in those spaces. However, the government seems to ignore all range of voices asking for removal. This gives play to renovation which aims to improve the current living environment of those bunkhouses and add new elements from current research such as biophilia, to the region. Cost decrease will be noteworthy and the future change will be significant. Despite from poor bunkhouses, some out dated apartments can also be improved using the idea of renovation. Giving positive intervention to the city is what modern society should think and implement. Though it may be a long-term period and little achievement may be seen, over-urbanization will show signs of reduction after persistence.

5. Conclusion

Development is inevitable for a species to grow and an essential turning point has come. Facing the changing world, human beings need to figure out a solution for a variety of issues including what the article mainly discussed about, urbanization and the consequences of over-urbanization. Currently, the influence brought by over-urbanization can be basically divided into environmental impact, health impact and cultural impact. These all demonstrated the terrible side effect of the process beside its positive effect. The author believes the situation can be abased by applying architecture intervention. Methods like biophilia design, prefabricated buildings and old house renovation were mentioned. The critical concept of those solutions is to utilize limited space left in the urban area as well as existing buildings to generate a new municipal system. Original functions are retained and intended to add more possible to the urban city to meet the changing demand of human beings. The essay wanted to emphasize the severity of over-urbanization, while giving some prediction of the future community. The way of building or arranging an area should be re-considered to better confront the problem and this procedure need to be done in the future before permanent damage appears. Beside pursuing development economically in the short term, long term sustainable growth should also be in consideration.

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