Urbanization Characteristic of the Skyscraper

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Abstract: The development of economy at full speed has accelerated the paces of the urbanization process. Rural surplus population is centralized to the city producing the demand for the urban land. In order to offer the usable floor area to the maximum extent on the limited land, under the support of new material, new craft and intelligent technology, impel the skyscraper to challenge limit of the height constantly; basing on the premise that meet the environmental quality, energy-conservation, ecological, skyscraper demonstrate their meet social scale and high-efficiency characteristic in the future; in terms of ecology and sustainable development, recommending utilizing solar energy as much as possible and ventilating naturally in the skyscraper, solve current situation of the skyscraper relying on the non-renewable energy excessively, in order to adapt to the urbanization process that accelerates day by day, alleviate the enormous pressure that the urbanization brings. Meanwhile, probe into the ecological architectural double-deck dynamic glass curtain wall in order to improve the ecological environment of the building within the skyscraper, create the pros and cons of the comfortable official working condition in improving the skyscraper. With respect of economizing the energy, adjusting the climate, the circulation utilizing of material and energy, harmonious, ecological appraising of the environment, merging naturally etc., describe the social and economic of the skyscrapers, the urbanization construction, constructing the essential feature of the area urban economy group. Predict the sustainable development trend of the skyscraper in advance.

Key words: Urbanization Intelligence Ecological Sustainable development

Urbanization refer to mankind produce with life style by village type to city historical course that transform, shown as rural population and transformed to urban population, and the course which the city is developing and perfecting constantly, have another name called the urbanization or urbanization.

1. Urbanization trend of China

Today, China's economy is developed at full speed, there is an undeniable fact, the process of the urbanization is accelerated, it is along " producing to summarize overallly → Life → Ecology" gradual progress orbit develop.

The development of the city of China is to regard initial industrial production as the prerequisite, attract a large number of people in the countryside to enter the city, ignore the ecological environment and service quality of life, has appeared in the city taking a big enterprise as subject, for instance An'shan, Daqing, etc., become the urbanization development trend of " production model " relying mainly on production.

As China implements the deeppenning constantly of the policies of reform and opening to the outside world, living standard, life style, infrastructure, fund input of the city, etc., all incomparable to countryside, take consumption difference between urban and rural residents as an example: Before reform and opening-up, urbanite's level of consumption is 2.6-2.8 times of rural residents', at the beginning of 1990s, urbanite's level of consumption was about 2.8-3.0 times of rural residents', in middle period of the 1990s, disparity was expanded to 3.3-3.4 times, bied the end of the 1990s, early years of 21st century, the difference between the two has exceeded 3.5 times of levels. The enormous economic difference of existence between town and country, lead to the fact that rural surplus population pours into the city in a
large amount, have formed the farmers' frenzied hunt for work in cities with influence. The factory with serious pollution manages or moves out gradually, stress life, give consideration to and produce, the phenomenon make urbanization development trend the urbanization process of " life type " relying mainly on life.

The city also produced a series of influence human survival and negative effects of normal development because of the undue concentration of population and industry. For instance the air pollution, the ozone layer is destroyed, and the great consumption to natural resources, such as energy, water resource, forest reserves, etc. of city, following the enormous consumption of these non-renewable resources, the mankind will lose the primary condition developed further. In addition, the costliness of gathering around and is stopped up in city traffic, price of land and room rate, and in vision and psychological incompatibility, it is a question of living space which concerns descendants to make the mankind realize ecological environment protection.

UNEP (United Nations Environment Program) council passed " the statement about sustainable development " in Nairobi in 1987, regard sustainable development (Sustainable Development) as a basic principle clearly. And define sustainable development: "Can meet present mankind's demands, and does not form danger to descendants' development and ability to meet their needs. "Chinese Government made " China's Agenda 21 " too in 1994, regarded sustainable development as one of the fundamental state policies.

Enter 21st century, the stability of China's politics, economic system, the development at the speed of 7.3-9.1% of every year of the economic growth rate. In 2003, per capita public green land 6.49 m², increase by 1.13 m² compared with 2002; The per capita road 9.34 m², has increased by 1.47 m² compared with the previous year; The per capita living space 23.67 m² of urban residents, has increased by 1.52 m² compared with 2000; Can be found out from this group of data, today, the people in the countryside concentrated to the city, index these increase with every year 1 about speed, increase progressively still.

Population 523,760,000 of urban residents calculate the basis artificially with 2003 only, the public green land has a net increase of 3,399 million m²; The road has a net increase of 4,892 million m², the per capita living space of urban residents has a net increase of 12,397 million m². Therefore, with China's existing national power level, still develop at the safe speed, prove urbanization of China process delayed effect sheer, meanwhile, look at urbanization process of " ecotype " relying mainly on ecology already begins in advance too.

The most famous scholar academician Wu LiangYong in China, predicts that China's urbanization rate would rise to about 55% of 2025 years since 30.9% of 1999, urban population rises to 830 million - 870 million of 2025 years from 1999 389 million, double the above. This shows, will become the important propeller of urbanization of the world with China with a population of several 20% of the world's total. The international authoritative organization has affirmed that " the 21st century will be a new urban century ". The urbanization level of our country sees the following form.

<table>
<thead>
<tr>
<th>time (year)</th>
<th>Urbanization level</th>
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</thead>
<tbody>
<tr>
<td>1950</td>
<td>11.20%</td>
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<tr>
<td>1957</td>
<td>16.00%</td>
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<tr>
<td>1960</td>
<td>19.70%</td>
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<tr>
<td>1965</td>
<td>17.90%</td>
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<tr>
<td>1978</td>
<td>19.90%</td>
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<tr>
<td>1998</td>
<td>30.40%</td>
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<tr>
<td>2000</td>
<td>36.09%</td>
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<tr>
<td>2001</td>
<td>37.70%</td>
</tr>
<tr>
<td>2002</td>
<td>39.10%</td>
</tr>
<tr>
<td>2003</td>
<td>40.53%</td>
</tr>
</tbody>
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Because of the development of economy, cause the cultivated area of 2003 to continue reducing. Build and take up 229,000 hectares of cultivated land in the whole year, enable only reducing 2, 537,000 hectares of cultivated land in the whole year, calculated by 0.067 hectares of per capita area of cultivated farmland, then 38,090,000 people will lose land in the
countryside; Add the industrial structure adjustment of the city, increase workforce's demand correctly, has stimulated the rising of the urban level of consumption too, will cause rural surplus population to be centralized to the city, on the limited urban space, having produced the demand for the urban land, and the city is under the circumstances that sustainable development is required, allow some leeway for the city, increase public green land and air cleaning space, under the support of new material, new craft and intelligent technology, often choose to develop to the high altitude, impel the human skyscraper to challenge limit of the height constantly.

2. Developing direction of the skyscraper

On later stage of the 19th century, the adoption on the building of the steel construction, broke through the restriction on height of the building of construction material, such as past stone, cement, etc., make building to high to develop into possible. Application of lift finish people history to climb skyscraper, let people reach top floor of skyscraper steadily and rapidly. Until the beginning of the eighties of the 20th century, application of the electronic computer, make building applied science main sign 4C technology of technical development progressively (namely Computer computer technology, Control control technology, Communication communication technology, CRT graphical display technology). Set up a computer integrated network in the building, make the building intelligent. Combine the modernized service and management style and provide a safe, comfortable life, study and working environment space for people. Because present construction technology and intelligent degree are not very perfect, state on cause skyscraper in "with high investment, high consumption, high material, high consumption, high to pollute". People pour into the city does not increase traffic jam and eliminating amount for consuming existing resources in the city, but pursue the high income and comfortable life quality. It marks intelligent 3A technology that an ordinary skyscraper is added (namely building automated system BAS, office automated system OAS, communication automated system CAS) become the intelligent building, investor then as purpose, throw in order to make the investment sparingly into little total 30% of fabrication cost, saving 3A technology, the building becomes the traditional building form, obviously this kind of form can't be "intelligent building" in the real meaning yet. Dirty air, consumption of the energy, crowded stream of people bring management and hidden danger of the security, this is not the result that urbanization brings, but appear in the concrete problem of the skyscraper in the urbanization process, in is it solve contradiction that urbanization appear of the process to look for, except that in society, politics, economy people, on the building, mostly let people feel natural return sense and comfort more in the limited space environment, the intelligent equipment can't meet this kind of demand, the ecological building arises at the historic moment, especially ecological skyscraper, it meet people come back natural love township complex, change the inherent attribute of the skyscraper, especially "skin" of its intelligence completely too, make building and intelligent to combine together organically, the two become an intact organism. The skyscraper should be developed in energy-conservation, low consumption, low pollution, renewable ecology direction, Germany Frankfort bank has offered the most effective evidence to us. The appearance of the ecological skyscraper, the "ecotype" urbanization process that appeared with our country just now is developed in step, it is the best way to adhere to sustainable development.

3. The urbanization of the skyscraper behaves

Today of scientific and technological progress, the dependence on resource of the skyscraper is larger and larger, resources in the nature are divided into for renewable resources (water, steel, etc.) and non-renewable resources (petroleum, coal, etc.), people must realize the sustainable development of the living environment in order to strive for the living environment for a long time. Must protect and economize the non-renewable resources, renewable
resources are only the limited reclaiming, the exhaustion of resources forces people's sight to change direction with the redevelopment of its solar energy, marine resources and existing utilization of resources not developed yet not exhausted, concentrate on being shown as 3R characteristic.

4. Brief characteristic (Reduced)

The course of the urbanization, to China, increase by a percentage point each time, urban population increase 2,000 or more than ten thousand, is it get high level architectural to it embodies a concentrated reflection of to be to summarize --Brief. No matter it is in the designing idea, using the place in the city, utilization of resources, possess the brief characteristic.

In the low, multi-layer building, the architect, in order to pursue the individual character, in the design, can not use various kinds of modelling symbols and materials stingily at all; And must simplify the structure component because of the request of the antidetonation and structure in the skyscraper, purify the elevation modelling of the building, meet the need of building ecological building "skin" (the curtain wall of double-deck glass), the "skin" make building with metabolism function, its structure form restrict the change of the modelling, the brief form is an inevitable choice, make the form of the building more succinct and lucid and lively. Use the ground in the limited city, increase or expand the environmental space inside and outside the building, dispel people on because the negative effect psychologically that population's increasing bring, the architect probes into the high limit of the building actively through various kinds of ways, and on the limited indoor space, intersperse exquisite afforestation, water scenery, mountain stone, abundant vision impression. Dense in last century 20 generation put forward slogan that is "more" then, though to restoring ancient ways that ideological trend put forward prevailing at that time, but the most rational form characteristic exactly to the present ecological building.

The utilization of resources refers to the use of the water resource mainly, on one hand economize the water, increase income on the other hand. It is to popularize the water-saving utensil and occupation mode, increase income and mainly use the undrinkable water to economize on water (the sea water and rainwater are collected). Germany punish method of respect to is it draw lessons from to worth, installation rainwater collect and use the device among building in rainwater, used for washing, watering and afforesting, safeguard the ecological environment in the skyscraper.

5. The characteristic utilizing (Reuse)

Service life in skyscraper is above a century, and to building in about 10 on average cycle of function of use, just as dense · all · Germany Luo say that "the use of the house keep changing, but dismantle us it to afford then, so we ' form follow the function ' put upside down slogan of Sullivan (L.Sullivan), namely build a practical and economic space, we dispose the function inside ". There are a lot of change factors of the function of use, the factors, such as development of social economy, the changing of consumption pattern, owner, etc., it is the subject which the realistic society puts forward for the architect too to involve the use of the skyscraper.

Not but mentioning the consumption of the energy about the question that is utilized again. The skyscraper in the past is by consuming the tangible energy (the coal and petroleum), but the tangible energy will be exhausted eventually, the invisible energy (solar energy, wind energy and geothermal power) is being wasted all the time, fortunately we have been already developing and utilizing solar energy, wind energy and geothermal power technology, the outstanding characteristic of the energy is pollution-free. Double-deck glass curtain wall structure to utilize typical example of solar energy, warm to have sunshine make glass scene have air that is heated and flowed inside the wall, lower the temperature and insulate against heat, carry on the metabolism of the air, heat offers kinetic energy and life hot water for equipment; Solar energy and wind energy offer some electric energy, reduce the electric energy to consume; Geothermal power utilizes...
difference in temperature to draw heat, satisfy normal operation of the air conditioner system, etc., state on make skyscraper appear "low make the investment, low consumption, low material, low consumption, low to pollute", adapt to the process of the urbanization.

6. The characteristic retrieving (Reclaim)

Building the construction material of the skyscraper and inclining to can be recycled even more, the recovery and resolving of different sanitary sewage lighten the demand for clean water, its starting point is still because of economizing resources as the purpose.

It is steel construction forms of different systems that the skyscraper relatively prevails in the structure form, the periphery protects the structure and adopts metal aluminium, aluminium alloy, glass, the metal and glass all belong to but the construction material of reclaiming. China is that a structure system of the skyscraper is mainly to cut the structure with the armored concrete frame, differ greatly with the goal of sustainable development, and the steel construction building uses the few one pitifully, someone calculates that that 10 million square meters are calculated according to the construction area of the annual steel construction, always using the steel amount to be about 1 million tons, only accounts for 1% of total steel quantity, the steel that really uses on skyscraper should be far lower than this figure. 35 years ago, the amount of steel used of twin towers of World Trade Centre of U.S.A. was 192,000 tons, it is present 1/5 which uses steel quantity of China. This group of data reflect and set out the application ability to reach construction material in the country and developing country, the reclaiming of the construction material is to concern the society and develop important project continually and steadily.

Retrieving the sanitary sewage and deal with the standard which reaches certain water quality through regeneration, as the normal water system of the undrinkable water, re-utilize, realize the benign cycle of water, solve the problem of washing the lavatory, scrubbing the vehicle, afforesting the water etc. Is it economize water, reduce pollution to reach, make ecological environment space that skyscraper offer to people, more comfortable and pleasant.

The urbanization is a slow evolution, the skyscraper is just like the digestion device of the urbanization, population concentration, promote the building to develop to the skyscraper. Meanwhile, the skyscraper is in the course of building, the respects, such as energy using, sewage recovery, building materials, etc. digest and receive a large amount of people to obtain employment, offer the working environment, improve environmental quality, digest various kinds of unfavourable factors that the urbanization brings, prepare the sufficient space for the process of accelerating the urbanization.

The world in the future is considered to be the world of a city, in 1993, the meeting in Tokyo of the United Nations claimed "the 21st century will be a new urban century". Urbanization level will reach 61%, mean that the times will come soon in the human skyscraper (Skyscraper), have architect predict in the future appearing 300 low skyscrapers, all lower group is it produce 3 times while being low to want than now. Though a lot of questions will exist, will need people to explore hard, but the land space that saves, has offered the green metabolism mechanism for human living environment, keep space surviving for the wild animal, maintain the nature ecological balance, it is the architect that strives for the duty-bound responsibility in the living space for the mankind.

Reference
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