

How to Promote Green Building Design in the City: Taking the Green Building of Shanghai Museum of Natural History as an Example

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Abstract: At present, China is still in the primary stage of socialist development. With the change of the current global development situation and the concept of "sustainable development" put forward in the 1980s, this concept began to become more and more popular. In the process of urban development, the environment will be damaged to a certain extent, and the sustainable development of the city is inevitable. Green building design can save resources and has become one of the hallmarks of modern cities. But green building is not widespread in China. Low-carbon life is very necessary, therefore, we should pay attention to the reasons why green building design has not been paid attention to and how to increase efforts to promote green building design. Green building should be the development direction of current construction industry. Adhering to the concept of ecology, energy conservation and sustainable development, green buildings will bring great changes to China's urban development. The development of green architecture in our country is still in its infancy, the green building design has failed to scale to thousands, its purpose is to promote people highly harmonious and unified, architecture, natural, economic and environmental benefits, social benefits fully coordinated, prompting the harmonious development of national economy and social environment, ecological environment quickly and well.

Keywords: urban planning, promoting green building design, sustainable development

1. Introduction

In recent years due to the sharp increase in urban population and the rapid development of the industry, a large amount of wastewater has not been properly handled and is drained directly, causing serious pollution of water environment monitoring data across the country have more than 1200 rivers, the pollution of more than 580, in the 7 major water systems, Liaohe, high river, huaihe river pollution, 78% of the country's river is not suitable for drinking water sources, Fifty percent of groundwater is contaminated. As a result, the problem of urban water pollution becomes increasingly serious.

Gradually, industrial and transportation industry development and the use of fossil fuels, the dust sulfur oxide, carbon oxide "ozone and other supplies to people, the atmosphere, make the atmosphere serious deterioration, lead to acid rain in most cities of the country, to industrial and

agricultural bring huge losses, serious damage to people's life and property security, a direct threat to the survival of mankind. Human life and production have produced a large amount of waste, 2/3 of the country's cities are surrounded by garbage, garbage flooding is not only obstructing the scenery, encroaching on land, and infectious diseases, but also serious pollution of the environment at the same time to strengthen the water, air, soil pollution [1]. Green building is the positive response of human beings to the crisis of their environment [2]. The green building embodies the high-level coordination between architecture, nature, and people, and represents one of the directions of future architectural development. As the PUDONG design institute director told the author said:

Green buildings use much less energy than traditional buildings. Traditional buildings consume a lot of energy. According to statistics, buildings consume 50% of global energy and produce 34% of pollution in the process of construction and use. Green buildings greatly reduce energy consumption and make full use of geothermal, solar, and wind energy; Green buildings use 70 to 75 percent less energy than traditional buildings.

The application of sustainable development theory in urban construction, especially in green building design, from the establishment of planning concepts to the specific use of green technology and the selection of environmentally friendly building materials, all reflect the determination of the construction industry to help the sustainable development of urban construction. Based on the sustainable development of green building design, proposed in the current era of the urbanization construction industry environmental imbalance is making a great role. Due to the backward construction technology and the failure of planning after construction, a lot of natural resources are wasted and even polluted. Water shortage is one of the main problems in the current society. A large amount of water is wasted. Even in domestic projects that use water for purposes, such as buildings and gardens, appropriate water-saving measures are not taken. Because of the sharp increase in energy demand, a large number of thermal power projects are relied on to obtain power energy, which further aggravates environmental pollution [3]. With the improvement of people's living standards, household waste also accelerates the pollution of the environment, resulting in a large number of urban waste production. Green building design provides solutions to all of the above-mentioned problems and helps to keep the environment clean and green. Studies show that green buildings are the only way to a sustainable future.

In the process of building development, the goal of green building design is to provide comfortable, healthy, and environmentally friendly living spaces for people. Production and transportation of construction materials, the structure of the planning, design and build, surplus or waste recycling and disposal of raw materials, building use during maintenance measures, building a life after disassembly, effective use of the land, energy, building materials, and water resources to reduce the energy consumption during the construction, as well as its influence on the natural environment. The concept of green building is the scientific and comprehensive utilization of modern architecture and ecological environment so that the residential building and its surrounding supporting environment become a small ecosystem. The concept of green building is the harmonious design of the material building and ecological building, and the design concept of modern architecture pursues sustainable development [4].

2. How to Achieve Green Building: A Case Study of Shanghai Museum of Natural History

Similar to the ideas of many other project owners and designers in the early stage of green scheme design, designers also expressed a passionate hope to imprint "words" on this "name card of Shanghai", trying to apply various advanced green technologies to the building. With the deepening of the design, researchers found that each green technology has encountered incremental cost, cost-effectiveness (economic benefit), technical reliability, technical applicability, technical integration,

and so on. The most typical cases are the incremental cost of double-layer curtain walls: solar photovoltaic power generation, the cost performance of color-changing glass; The construction technology of tunnel fresh air being mature and reliable. The spatial applicability of reclaimed water systems and radiant air conditioning. Architects and homeowners are aware of and are starting to analyze green technologies with the help of some buried tools [5].

The person in charge of Pudong Design Institute explained the advantages of green building design to the author:

First, green buildings respect the local nature, culture, climate, local conditions, and local materials, so there is no clear construction mode and rules. The traditional architecture adopts commercialized production technology, and the standardization and industrialization of the construction process result in very similar architectural features in the North and south of the river. The green building emphasizes the use of local culture, raw materials, respect for local natural and climatic conditions, and is completely localized in style, creating a new aesthetic feeling and healthy and comfortable living conditions.

Second, green buildings make full use of nature (such as green space, sunlight, air, etc.) and pay attention to the effective connection between interior and exterior. Open buildings have many differences from closed traditional buildings. Traditional buildings are closed and completely isolated from the natural environment. Indoor environments are often unhealthy. The green building's interior and exterior adopt the effective connection method, which will adjust the climate change automatically, to the house personnel's load, and the environment's sensitive load and automatically adjust, to create a very comfortable, healthy indoor environment for mankind.

Third, in the process of green building, environmental protection factors should be paid attention to whole process. Traditional building forms are only responsible for the environment in the process of construction or use, while green building emphasizes the whole process from the mining, processing, and transportation of raw materials, to the use, to the abandonment and demolition of the building. It is responsible for mankind and the earth.

So how does green technology work in buildings? The Shanghai Museum of Natural History has constructed the following five systems:

System 1: Building energy-saving curtain wall

Energy-saving glass curtain walls and stone curtain walls are adopted as the exterior protection system of the building, and various forms of external shading systems are fully combined to convert the building skin with the largest energy consumption into an energy-producing surface and an energy regulating device for internal space.

System 2: Integration of green insulation exterior wall and green roof

According to the characteristics of various kinds of wall and roof greening and the requirements of the project of the Shanghai Museum of Natural History, the expanded roof greening method is adopted. This kind of roof greening is of low maintenance and irrigation-free type, which can be used as the heat buffer of the indoor space of the building and reduce the cost of air conditioning. At the same time, each square meter of roof sod can absorb about 02kg of airborne particles every year, which can effectively reduce the rate of soil and water loss.

System 3: Ground source heat pump technology

Ground source heat pump technology is a kind of high efficiency, energy saving, and environmental protection system that uses the earth's shallow geothermal resources for heating and cooling. The museum ground source heat pump system uses renewable energy -- geothermal, which is pollution-free, smoke-free, and waste-free, as the main cold and heat source. System operation of Windows, skylights, and mechanical ventilation systems for winter heating surfaces. This system meets 100% of the total load demand, summer refrigeration meets 60% of the total load, and

ventilation system energy saves 25%, and can reduce the emission of pollutants and refrigeration demand, which is helpful to alleviate the global pollution problem, and improve indoor air quality.

System 4: Heat recovery technology and thermal comfort conditions.

The heat recovery of this project is mainly used in two parts, namely the ground source heat pump.

System 5: Natural light guide light technology main engine heat recovery and preheated domestic hot water and air conditioning exhaust heat recovery [6].

3. The Limits of Green Building Development

At present, green building design is still in the initial development stage, and there are limitations to the concept of green building design.

The common people, even the construction industry and the government management departments have a great misunderstanding and deviation in the understanding of the green building. Some of them think that green building is to increase the coverage of green vegetation in the building, or they just pile high cutting-edge technology on the building without considering the actual needs. To expand the market for green buildings, price and widespread demand are the drivers [7].

At present, green building design is still in the initial development stage, and there are limitations to the green building design concept, about the popularization of green building is still difficult. Our standards also need to be further improved. The development of green buildings in China is at its initial stage, and the corresponding policies, regulations, and evaluation system need to be strengthened, and a series of complete systems need to be established. The corresponding incentive system is relatively backward, the long-term fiscal and tax mechanism to support the development of building energy conservation and green buildings has not been established, and the lack of effective incentives such as subsidies or tax relief for green buildings makes it difficult to improve the enthusiasm of enterprises to develop green buildings. Our technology is not very mature, and there is a misunderstanding in the choice of green building technology. This research believes that green building requires all high-end technologies and products to be applied in the building. This research always wants to realize all new green and energy-saving technologies in one building, but this idea is difficult to realize. Some projects in the design some no practical value of the use of new technology, over-reliance on equipment and technical systems to ensure the comfort of life and high standards, and architectural design ignored natural ventilation, natural lighting, and other measures, directly leading to the rise of construction costs, in the market is difficult to attract the attention of consumers. The level of economic development is also a reason that limits the development of green building design.

Specifically include the following questions:

3.1. Green Building Materials Will Be More Expensive Than Traditional Buildings

The level of economic development is also one of the reasons that limit the promotion of green building design. It is necessary to select appropriate green building schemes and materials according to the actual situation.

3.2. Government Support Is Not Strong Enough and Publicity Is not Extensive Enough

At present, although green building contains great ecological value, their early investment is large and the investment recovery cycle is long. In a market-based economy, such projects are bound to be snubbed. Although the government has tried to implement some tax cuts, incentives, and other

regulatory levers to promote the development of green buildings, these policies cannot make developers get better profits.

3.3. Lack of Professional and Technical Personnel

China's green building technology is in its initial stage, and the related construction technology is immature. Many firms interested in building efficiency would be deterred by the high cost of importing foreign technology. The construction of green buildings needs the cooperation of planning, design, construction, and exploration departments to be completed successfully. For designers, the workload will also increase dramatically. At present, many designers do not know about green build buildings.

4. How to Break the Dilemma of Green Building Promotion

4.1. Improve the Legal System and Strengthen Supervision

Government will further improve policies and regulations related to building energy conservation and green buildings to ensure that there are laws to follow. People will strengthen supervision, strictly supervise and inspect building energy conservation and green building projects, and resolutely investigate and punish projects that violate relevant laws, regulations, and mandatory standards on building energy conservation.

Government will supervise and manage the implementation of new construction industrialization projects in the region, and accelerate the establishment of dynamic supervision and industry statistics systems. For projects that have enjoyed the support of relevant policies or special funds but have not been implemented by the construction drawing design documents, the policy support shall be canceled, and the responsible unit shall be ordered to return or make up the relevant funds within a time limit, and the responsible unit and the person in charge shall be punished according to law.

4.2. Increase Capital Input and Policy Incentives

Government will study and improve fiscal support policies, integrate special fiscal funds, and further increase fiscal input for the development of green buildings, with a focus on projects to enhance green construction in new buildings, upgrade energy efficiency in existing buildings, and promote scientific and technological innovation and the application of renewable energy in buildings. People will increase provisions for rewards and penalties and strengthen enforcement of energy efficiency standards for new buildings.

4.3. Strengthen Technical Support and Encourage Scientific Research

Government will encourage and support enterprises and R&D institutions to research and develop new technologies, processes, materials, and equipment for green buildings. The research and development expenses incurred in the development of new green building technologies, new processes, new materials, and new equipment may enjoy preferential treatment such as pre-tax additional deduction by relevant State regulations. Strengthen the construction of experts, strengthen the training of personnel in the construction, design, construction, supervision, property management units, and relevant administrative departments, and include relevant knowledge in the continuing education and training and practice qualification examination [8]. People will establish a practical training basis for industrial workers and a system of training, assessment, and employment. Relying on pilot and demonstration projects, through enterprise internal training, to cultivate vocational and technical workers with relevant professional technology and production

and operation experience. All enterprises should actively explore and establish a new construction industrialization talent introduction mechanism, and strengthen the cultivation and reserve of high-level management personnel.

4.4. Strengthen Publicity and Training to Improve the Public Opinion Atmosphere

Extensive publicity and education in various forms should be carried out to raise the public's understanding of the importance of developing green buildings, guide the whole society to form a production, life, and consumption mode that saves resources and protects the environment, and create a good atmosphere for the development of green buildings. Make Green Building action an important publicity content for National Energy Conservation Publicity Week, Science and Technology Activity Week, Urban Water Conservation Publicity Week, National Low Carbon Day, and other activities, improve public awareness of green building, advocate green consumption concept, popularize knowledge of conservation, and guide the public to use energy-saving products rationally [9].

Government will actively create a series of green projects such as green schools, green hospitals, green hotels, and green shopping malls, further promote green building identification, accelerate the cultivation of several green building demonstration projects, and lead the development of green buildings in the whole society [10].

5. Conclusion

Green building is not a general sense of building green, it is the human to cope with the fast development of economy brings to the environment pressure, in the construction aspects of a concept, hope to live more healthy, comfortable and safe at the same time can efficiently save resource, energy, land, water, materials, to reduce the impact on the environment.

Green building is the greening of the whole life cycle of a building, which includes many technologies, from building materials technology to recycling technology. It is worth noting that it is not independent of the traditional building technology but re-examines the traditional building technology from the perspective of "green", which is a new building technology in line with the sustainable development strategy.

At present, the main investment and construction of green buildings in China are mainly among governments at all levels and real estate enterprises. Various green building design and construction technologies have been widely applied and promoted, and the quality of green buildings has been continuously improved. In the process of building development, the goal of green building design is to provide comfortable, healthy, and environmentally friendly living spaces for people. Production and transportation of construction materials, the structure of the planning, design and build, surplus or waste recycling and disposal of raw materials, building use during maintenance measures, building a life after disassembly, effective use of the land, energy, building materials, and water resources to reduce the energy consumption during the construction, as well as its influence on the natural environment. The concept of green building is the scientific and comprehensive utilization of modern architecture and ecological environment so that the residential building and its surrounding supporting environment become a small ecosystem. The concept of green building is the harmonious design of the material building and ecological building, and the design concept of modern architecture pursues sustainable development.

However, in China today, green building is not widely publicized or applied on a large scale, which is something people need to pay attention to.

There is no doubt that green will become the main color of China's future development. Green buildings adhering to the concept of ecology, energy conservation, and sustainable development

will bring about a great change in China's urban development. Green building development in our country is still in its infancy, the green building design has failed to scale to every household, its purpose is to promote people, buildings, natural three highly harmonious and unified, economic benefit, environmental benefit, and social benefit between fully coordinated, prompted the national economy, social environment, and ecological environment harmonious development quickly and well. Therefore, it is necessary to promote green building design on a large scale.

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