Study on Sustainable Development of Nursery Supply in Urban Greening Construction

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Abstract. Focusing on the impact of China's urbanization process and tree growth law on urban greening construction, this study explores how to plan the sustainable development of nursery to promote the level of urban landscaping. This paper takes investigation and research as the main method and path. According to the analysis of China's urbanization process and nursery case data, the reaction to the urban greening construction and the unbalanced development of the nursery appeared. The study found that rational planning of the tree growth cycle in the nursery and grasping the changes in market prices can promote the sustainable development of urban greening construction. The method of this research is objective and the research results will help urban planners and nursery operators to establish an effective evaluation system in practice.

1. Introduction
Nursery is an important basis for urban greening to supply raw materials. With the acceleration of China's urbanization process and the increasing demands of people's living environment, new requirements have been brought to urban greening. How to ensure the plant foundation of urban greening construction has put forward new development requirements for the construction of nursery as a tree supply base. Strengthening the construction of nursery and promoting the sustainable development of urban landscaping will be the need of urban construction in the new era [1]. However, the unbalanced development of the urban garden construction and supply base nursery has produced the following problems:
(1) The long growth cycle of seedlings has brought unsustainable development problems to the nursery business;
(2) The speed of urban greening construction is too fast affecting the supply of nursery;
(3) How to solve the sustainable development of urban greening construction and nursery development.

2. Research theory

2.1. Tree growth process and price analysis
The seed of the tree is germinated to grow the radicle and the germ to form a seedling, and the seedling produces cells by photosynthesis. The cells are distributed in the leaves and branches through mitosis, which makes the leaves of the trees flourish and the branches grow long and thick. This is a long process.
According to the data of the tree growth process in Jiangxi Province, Osmanthus trees are grown at a growth rate of 0.8 cm/year, and it takes about 10 years to reach 8 cm. The camphor tree is grown at a growth rate of 2 cm/year, and it takes about 10 years to reach 20 cm.

Figure 1. 2018 Osmanthus tree (single pole diameter).

According to the 2018 Osmanthus tree and the construction cost information trend chart of camphor tree, it can be seen that: The growth of the tree's diameter is greater and the price will be. When the tree rod diameter reaches a critical value, the price will double. According to their comprehensive situation, the operating nursery can reasonably plan the growth cycle of trees and obtain higher value. Therefore, the nursery needs to make strategic planning.

Figure 2. 2018 Camphor tree (rod diameter) price trend chart.
2.2. Urban development process

China has implemented Reform and Opening policy, which has stimulated the rapid development of Chinese cities. China’s urbanization rate increased from 17.92% in 1978 to 59.58% in 2018. The resident population of China's cities and towns has grown from 170 million in 1978 to 810 million in 2018. The number of Chinese cities has increased from 193 to 672 [2].

![Figure 3. China's urbanization process in recent years.](image)

(Figure 3) It is reflected that the level of urbanization in China has been steadily increasing in recent years. Expected by 2040, the proportion of urbanization in China will reach over 80%, catching up with the urbanization rate of developed countries in Europe and America. Urbanization development will drive the demand for urban landscaping construction to increase.

The ecological benefits generated by urban landscaping can improve the ecological environment to maintain ecological balance. The cultivation of landscaping can also enhance the image of the city and bring economic benefits for investment promotion, industrial upgrading and land appreciation.

3. Research methods

At present, the problem of urban greening construction is the lack of green landscape belts, the planting trees are smaller in size, and the varieties of plants are relatively simple. The reason is mainly because the production of operational nursery is difficult to meet the needs of urban greening construction. The instability of the nursery supply directly affects the level and quality of urban greening construction [3]. The development of the nursery has led to an imbalance in the development of urban greening in China.

According to the phenomenon, we can understand the situation through investigation and research. Because the research method is not limited by time and space, it can obtain a large amount of data in an indirect way in a short time. This article collects data on China's urbanization process, and obtains detailed data on development status of “A” nursery through the parties to conduct. Conduct a comprehensive analysis and research on the data to arrive at the results and identify problems.
4. Discussion analysis and results

4.1. “A” nursery profile and data analysis

Overview: “A” nursery is located in the northeast of Nanchang City, Jiangxi Province. A 40-year land lease agreement (63.92 acres) signed by an individual industrial and commercial household and a state-owned farm, with a rent of 120 Yuan for 0.165 acres in each year (a one-time payment of rent every five years). Construction began in October 2010 and was basically completed in March 2011. The main seedlings planted in the nursery are: 22,000 camphor trees (6cm), 5,000 Creases yedoensis (4cm), 10,000 Photinia serrulata (1cm), 5000 Zelkova serrata (Thunb.) (3 cm), and 5000 Koelreuteria paniculata Laxm. (3cm). This project employed 2 long-term garden workers, 1 manager, and with several mechanical equipment to finish the work.

According to the income and expenditure cost trend chart, we can get: The “A” nursery construction has the largest investment in the first year, and the second year as the input supplement, the follow-up investment is the daily management and protection cost. From the third year to the fourth year, there was small amount of income that can maintain daily management and protection. From the fifth year onwards, a large number of trees were sold for cost recovery, and until 2018, there was still a funding gap that was not recovered. (However, “A” nursery basically completed the second round of tree replanting work in the year of 2018.)
According to the expenditure structure chart, it reflects that: The proportion of “A” nursery input is mainly in seedling cost and labor cost, accounting for 66% of the total investment. Fertilizer and machinery costs account for 11% of total investment. It shows that the proportion of investment in traditional nursery is still in the raw material and labor costs. There is still room for improvement in investment management, technology, planning, and machinery.

According to “A” nursery data analysis: The “A” nursery management approach is still extensive and lacks the long-term planning strategy shown in Figure 6. The use of new technologies is not enough, especially in the field of garden plant breeding and the introduction and cultivation of new varieties.
With the advancement of urbanization, all localities have continuously increased their investment in landscaping. In the overall planning of urban greening, multiple tree species and large trees are required. To broaden the planting surface and other ways to increase the green area, improve the urban environment, and improve the urban ecological quality. The data of “A” nursery reflects the lack of long-term planning for the management and operation of nursery in China, ignoring the long-term interests and social benefits. According to the data of figure 5, the large trees are getting scarcer and the seedlings are still in the growing season. In recent years, it has not been able to satisfy the demands for green seedlings in urban greening. There are not many varieties of garden plants, which cannot meet the needs of urban greening construction. Thus, the supply role of the nursery in the urban landscaping work is absence.

5. Conclusion
(1) According to the needs of urban construction and combined with the tree growth cycle, reasonably plan the spacing, variety, period of tree sales, cost input and other factors of seedling planting can effectively solve the problem of sustainable development in the development of nursery.
(2) Nursery is the material basis for urban green development. In recent years, urban construction has raised the ecological environment to a higher level. Increasing and upgrading the urban landscaping construction has led to an increase in the demand for seedlings. The income of operators of tree production will also be correspondingly improved, and this phenomenon will drive more nurseries to continue to expand and develop.
(3) It is recommended that forestry exclusive colleges provide special courses for nursery planning, nursery management, and nursery business, and cultivate special nursery management talents. The Institute of Tree Science should increase funding for cultivation management and research and development of new tree species. To establish a large market for the nursery industry, and let the operators who manage the trees actively upload and share the tree resource data. This will vigorously promote the development of the nursery which can advance the sustainable development of urban greening [4].

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