

The Factors and Strategies of Green Gentrification

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Abstract. It is clear that urban green spaces provide numerous health, social, and ecological benefits. However, without adequate preventative measures in place, the environmental benefits provided by these projects such as parks, trails, and better accessibility often lead to a rise in property values and significantly higher housing expenses contributing to green gentrification. This paper studies the factors of green gentrification and provides suggestions for solution and strategies to prevent the problems caused by green gentrification. Results show that characteristics of green space and cities' geography and development are the main factors of green gentrification. This study focuses on the role of the function, scale of green space and park premium and geographical location in terms of characteristics of green space and distance from the city center, population change, economic growth, and city size in terms of cities' geography and development context. To alleviate the problem caused by gentrification (such as financial pressure, social conflict, and increasing psychological costs), strategies including "just green enough", multi-stakeholder participation, and fair benefit distribution system can be taken.

Keywords: Green gentrification, environmental justice, urban green space, social equity, sustainability, urban planning.

1. Introduction

The positive significance of urban green space in the environment, social economy and other aspects is often publicized by the media, and people gradually realize the importance of urban green space in the ecological environment and public health. According to the former study, it demonstrated that urban green spaces provide numerous health, social, and ecological benefits. Specifically, green spaces contribute to improved physical health through encouraging active lifestyles and creating localized conditions reducing rates of disease caused by air pollution and noise [1]. However, the impact of urban green space from a social perspective is not always sustainable. Studies have found that the creation of urban green space in low-income areas or the redevelopment and utilization of bad land may produce the green space paradox.

Research shows that as undesirable land is cleared for development, communities benefit from new, superior urban green spaces. The local environment has begun to regain the vitality of these lands then they are once again valued by companies or private investors. The developer purchases dilapidated buildings, develops them into high-end residences, and attracts wealthier residents. Indigenous residents who had long fought for environmental justice ended up being unable to afford the rising cost of living and the gentrification environment has forced displacement [2], this phenomenon is called "green gentrification" or "green gentrification", "environmental gentrification". Studies have indicated that communities with a higher quantity, larger scale, and better quality of new urban green spaces tend to be more appealing. However, it could also lead to the emergence of green gentrification problems [3].

It's essential to first understand the definition of green gentrification, and the seriousness of its effect factors, before implementing greening agendas and projects to solve socio-environmental and health challenges while prohibiting gentrification and displacement [3]. One study explored the green emerging class phenomenon of urban parks and other types of green spaces in 28 cities in North America and Western Europe. Research has found that green space projects in cities can improve the urban environment and health, but at the same time may also lead to the phenomenon of green emerging class [4]. Some studies about green gentrification have expanded beyond the Northern world context. Selecting Chongqing, China as a case study [5], one paper used the hedonic price

model and geographic weighted regression model to analyze the effect of urban green space size on housing prices, and conducted a questionnaire survey to understand residents' attitudes towards green upstarting and the relationship between park scale and green availability. Other studies are researching the association of green gentrification between different types of greening rather than parks like GRI (green resilient infrastructure) [6]. Although some of these studies' topics may be different from "green gentrification," these ideas can overlap. This paper utilizes the term "green gentrification" for clarity and a more condensed discussion of the topic's implications.

This study focuses on green gentrification as study cases to find the factors of this sort of gentrification promoted by the greening agenda and provide suggestions for solutions and strategies to prevent the disruptive influence of green gentrification.

2. Factors of green gentrification

Scholars have identified and measured gentrification in a variety of ways. Landis points out four basic factors that can be used to measure community gentrification: (1) The overall demographic and economic characteristics of community residents and business architecture; (2) The physical state of the stock and housing financial characteristics; (3) The number and demographic characteristics of new immigrants in the community; (4) The inflow and outflow of community capital investment [7].

In the research, many studies considered the distribution of residents by their educational level, income level, professional status and real-estate prices in the neighborhood as indicators to assess the degree of gentrification. Furthermore, these studies collected several forms of data on greening areas which is the main factor contributing to green gentrification. These data include various types of green space and cities' geographic and developing backgrounds.

After the data collection, studies commonly used quantitative modelling methods including linear regression, logistic regression and spatial geographically weighted regression to recognize the association between these factors and indicators of green gentrification. Other studies used qualitative methods like Interviews with key insiders, field research, historical documents, and media reports, focusing on the local participants of different roles and the experience analysis influenced by gentrification, especially on the psychological perception of the transformation of neighborhood network relations. For example, through surveys, researchers can more accurately scope the study and obtain more representative indicators than census data. In addition, questionnaires can also collect residents' attitudes towards green upstarts, which is information that cannot be obtained only applying quantitative analysis and census data [5].

2.1. Characteristics of green space

As multiple cases of green gentrification spread around the world, scholars begin to explore which characteristics of green space are important indicators that affect gentrification, focusing on the role of the function, scale of green space and additional value like park premium and geographical location in gentrification.

2.1.1. Function

In terms of the function of green space, studies have shown that green parks with positive traffic functions can lead to green gentrification more than other public parks. Rigolon's study also found that greenways, which connect multiple communities and serve as the basis for integrated traffic, are more likely to trigger green gentrification [8].

One study exploring green gentrification in 28 global northern cities discovered that parks are the form of green space that is more consistently positively connected with gentrification processes through an international analysis that uncovers trends at the city level. Additionally, this paper discovered some evidence that recently established nature preserves are adversely correlated with gentrification processes [4].

In contrast, different types of green space (such as parks, gardens, greenways, and recreational areas) play multiple roles in gentrification processes (some in a good, some in a negative, and some with no influence).

2.1.2. Scale and Size

About the size of green space, many studies have shown that large-scale urban green space is more likely to cause the result of gentrification. Small-scale urban green space does not have the same effects, while it's beneficial for a city to have small-scale urban green because urban residents can obtain more average green space resources. However, in Rigolon's recent study, ten major cities in the United States were taken as subjects to investigate the gentrification of the new parks built between 2000 and 2015. It was found that there was no significant correlation between park size and gentrification [8].

2.1.3. Park Premium

According to much research, gentrification can be identified by how much more expensive housing is relative to the neighborhood average [7]. From the viewpoint of house affordability, this. From this vantage point, Bo not only thought that park premium is a reliable indicator of the development of green neighborhoods, but also elaborated on why park premium is actually a stronger factor of green gentrification than park size by stating the association between park premium and gentrification phenomenon which is previously incompletely explained by park size.

Small parks have no impact, while housing costs are significantly impacted by large and midsize parks. Larger parks tend to raise residential values significantly, because parks in desirable areas fetch a greater premium. This could be an acceptable justification for the assertion made by the vast majority of studies that gentrification is more likely to occur in areas with larger parks. Parks nearby have these premiums, whereas parks located farther away, despite frequently being greater in size, are not surrounded by housing areas and thus do not. This may explain studies contending that gentrification is connected to location but not to park size [8].

2.1.4. Geographical Location

In terms of the geographical location of green spaces, the study of Barcelona by Anguelovski et al showed that the geographical location of urban green spaces is important, and only new urban green spaces established in areas with ideal characteristic locations such as close to the city center or shorelines promote gentrification [9]. In addition, In Rigolon's regression analysis of ten cities in the United States, the size, function and geographical location of the park were also considered. It was found that new parks close to urban areas cause a higher degree of gentrification than parks located in urban suburbs [8]. These studies show that the geographical location of green spaces also has a very important impact on gentrification.

2.2. Cities' geography and development context

A city's geography and urban development context have important influences on gentrification. First, a city's geographical location and natural environment can influence the trend of gentrification. For example, areas located in the center of a city or close to core business districts are more susceptible to gentrification because these areas generally have better infrastructure and amenities, attracting more investment and high-income people. Secondly, the city's development background will also have an impact on gentrification. Factors such as a city's economic status, industrial structure, and employment opportunities will all alter the cities' population. In addition, there are also other factors like economic growth and city size playing a significant role in gentrification.

Understanding these factors can help urban planners and policymakers better address the challenges posed by gentrification and take appropriate measures to protect the rights and interests of low-income residents.

2.2.1. Distance from the urban center

An area's proximity to the urban center can influence gentrification. Typically, areas closer to the city center are more desirable due to their accessibility to amenities, employment opportunities, and cultural attractions. As a result, these areas often experience higher levels of investment and redevelopment, leading to gentrification. Gentrification tends to spread outward from the city center as demand for housing and commercial spaces increases.

2.2.2. Population Change

Cities with better economic development usually attract more investment and high-paying job opportunities, thereby attracting more high-income people causing population change. Population change plays a crucial role in gentrification. When a city experiences an increase in population, there is a higher demand for housing, which can drive up property values. This increased demand can lead to the displacement of lower-income residents and the influx of wealthier individuals or families, contributing to gentrification. Conversely, population decline may result in disinvestment and a decrease in gentrification pressures.

2.2.3. Economic Growth

Cities with strong economic growth often attract investment, businesses, and higher-paying jobs. This can lead to an increase in demand for housing in certain neighborhoods, resulting in rising property values and the displacement of lower-income residents. Economic growth can also drive urban revitalization efforts, such as the development of new amenities, infrastructure, and cultural institutions, which can further contribute to gentrification.

2.2.4. City Size

The size of a city can influence the scale and pace of gentrification. Larger cities tend to have more diverse neighborhoods and a wider range of housing options, which can attract different socioeconomic groups. Additionally, larger cities often have more resources and capacity for urban development and investment, making them more susceptible to gentrification pressures. However, smaller cities can also experience gentrification. Albeit on a smaller scale, they undergo economic growth and demographic changes.

It's important to note that these factors interact with each other and with various social, political, and historical contexts, making the gentrification process complex and multifaceted. Additionally, the impacts of gentrification can vary widely depending on the specific characteristics and dynamics of each city.

3. Strategies for green gentrification

3.1. Problems caused by green gentrification

There are many assessments of the consequences of various roles on gentrification because it may have both beneficial and negative effects on society, the economy, and culture. Supporters hold the view that revitalizing newly developed urban green space or vacant land could substantially enhance the surrounding ecosystem and boost the city's overall reputation. Scholars have recently recognized the detrimental effects of green gentrification and have started a variety of conversations, focusing especially on financial strain, social tensions, community ties, and the rise in psychological expenses.

3.1.1. Financial Strain

While rising property taxes are typically onerous for low-income residents, the growth of green gentrification raises the value of houses and the environment, attracting more affluent individuals to live in. Because individuals who possess property and can afford high taxes will enjoy the growth in property value, poverty-stricken residents may be obliged to pay high tax bills if they intend to remain in the community.

3.1.2. Social Tensions

Additionally, gentrification's effects on community relations and residential stability in city areas have received particular attention. Many inhabitants of color believe that urban greenery is associated with racial conflict and past suffering. When Hispanic families with children and older citizens visit areas near Chicago's 606 Park, some of them believe they are no longer potential users of the project and are not welcome here because these urban green spaces frequently grant environmental privileges to white inhabitants. Local communities have transformed, wealthier white newcomers frequent the trails, and families with young children and the elderly are less likely to utilize them because of their high riding speeds [8].

3.1.3. Rise in psychological expenses

Some research have noted that because a lot of studies neglect the unpopularity of inhabitants (such as prejudice, abuse, or other hazardous events), negative consequences of green gentrification may offset the health advantages of urban greening. Urban green space could worsen as opposed to mitigate the healthy disparity brought on by racial and socioeconomic status.

3.2. "Just Green Enough" Strategy

According to the results of previous studies, it is found that not all urban green spaces will cause the consequences of gentrification, and the promoting effect of urban green space on gentrification is related to the scale, quantity and function of parks. Curran and other scholars put forward a way to solve the problem of green gentrification as "Just Green Enough" intervention [10]. The core of the concept is that, in order to prevent green gentrification, the local government and organizers are ready to create a green space to suit the needs and desires of community members instead of market-oriented construction meant to promote financial or political growth. Its specific strategies include the construction and development of small and scattered green spaces, including the promotion and improvement of existing brownfields or green spaces with low utilization, and the construction of new open water areas for community parks. Plus take comprehensive improvement measures to enhance the practicability and accessibility of these green spaces. In addition, some scholars have proposed that some local landscape construction models can be adopted to avoid the risk of gentrification. For example, the construction of a productive landscape can be used as a kind of urban agricultural landscape and can also be used as a place for leisure activities in combination with community gardens. Furthermore, it can also provide employment opportunities to increase income, to enhance neighborhood interaction in the community. In other words, the above "just green enough" measures are green interventions aimed at achieving environmental justice and social equity.

3.3. Multi-stakeholder Participation

The participation of multi-stakeholder groups can effectively avoid the problem of unfair distribution of interests of all parties in the construction process. Regardless of age, gender, cultural background and social status, all relevant participants should have the right to participate in the construction of local facilities for the opportunity to clearly express their needs and requirements, in particular, the need to understand the demands of low-income groups, as they are often at a disadvantage and easy to be ignored. The multi-party participation mechanism requires decision-makers to comprehensively consider the needs and expectations of multi-stakeholders through an "equal perspective". Specific strategies include conducting discussion groups among multi-interest groups and inviting multi-sector and multidisciplinary experts to conduct seminars in the form of regular research interviews to understand the needs and expectations of different groups and seek solutions. Secondly, the scope of discussion on urban green space projects should be expanded. It should not only consider the residential and financial compensation solutions for neighborhood inhabitants who participated in the initial building but also simulate the consequences that may occur in the future. Social and economic equity and livability are supposed to be both taken into consideration, because it can be found from studies that green gentrification will not only directly

cause an increase in housing values and the agglomeration of high-end business formats but also cause changes in neighborhood relationships and psychology, the pressure of displacement and the loss of local traditional culture.

3.4. Fair Benefit Distribution System

We also need to establish and improve a fair benefit distribution system, which includes not only the compensation for the relocation of residents caused by urban green space, but also the fair distribution of environmental resources, social and economic resources. First of all, no matter whether the ecological environment brought about by the new green space is fairly distributed or not, long-term residents and new immigrants should be able to share the right to use the green space in order to enjoy the public health benefits. In some cases of green gentrification in the past, it was found that in some of the new green spaces, the wealthier white groups tried to exclude the black and poor people from the new green spaces, and even accused them of destroying the environment. In addition, in the allocation of park space, it is also necessary to balance the habits of different groups as far as possible, and consideration should be given to designing large open spaces for active physical exercise and adopting less space for barbecues and other places that may be more preferred to specific user groups.

Secondly, in terms of economic benefits, the relevant decision-making bodies of the government should establish and improve the benefit distribution mechanism before and after the project. In fact, in the process of urban expansion in China, urban suburbs or villages close to urban concentrated areas are usually selected for development, because these areas have a relatively low development cost and a good geographical location close to the urban area. The re-development and utilization of brown land or investment in urban green space in these places can often bring long-term ecological, social and economic benefits and stimulate employment opportunities and enhance the competitiveness of cities. At present, the Chinese government focuses on the construction of resettlement housing and economic subsidies and mainly provides economic subsidies according to the area of agricultural land, but in the case study, it is found that this kind of compensation is not equal in the past. The government's compensation for the value of housing and agricultural land for relocated residents is lower than the average market value.

Lastly, it is also necessary to establish and improve the post-distribution of benefits brought about by the development of the project, rather than separating the connection between the relocated residents and the land market. Local residents need to be compensated for the benefits after completion using cooperation, municipal financing or the establishment of a special late-stage interest income fund, and they should also enjoy the benefits brought by the rise in land value. Therefore, it is necessary for a reasonable reformation of the compensation mechanism.

4. Conclusion

This study conducts research studying green gentrification to find the factors of gentrification promoted by the greening agenda and provide suggestions for solutions and strategies to prevent the problems caused by green gentrification. By applying many methods like linear regression, logistic regression and spatial geographically weighted regression, it is found that characteristics of different types of green space and cities' geography and development are the main factors affecting green gentrification.

Characteristics focus on the role of the function, scale of green space and additional value like park premium and geographical location in gentrification. Green spaces with different types of functions have multiple impacts on green gentrification, and parks are consistently positively connected with gentrification processes, while the effects of other types of green space are hard to determine. Besides listing characteristics of green space, this study looks into cities' geography and development context to find factors of a broader range of gentrification than green gentrification. An area closer to the city center acquires advantages like accessibility to amenities and employment opportunities so that it attracts investment and redevelopment leading to gentrification.

By understanding these factors, urban planners and policymakers can better address the challenges posed by gentrification and take appropriate measures to protect the rights and interests of low-income residents. Three strategies provide solutions from different perspectives. The “just green enough” strategy aims to design a green space that is not market-oriented but a place fulfilling the needs and requirements of residents in order to avoid gentrification. In addition, to maintain social equity, multi-stakeholder groups should participate in the construction process so that the needs of disadvantaged low-income people will not be ignored. Last but not least, there is also a need to establish and improve a fair benefit distribution system, which includes not only the compensation for the relocation of residents but also the fair distribution of environmental, social and economic resources.

The limitation of this study means the necessity for further research. First of all, this paper mainly studies the impacts of gentrification can vary widely depending on the specific characteristics and dynamics of each city so the factors of green gentrification require further study to be more inclusive and detailed. Furthermore, the association between research methods and conclusions of green gentrification in different studies can be a research topic in the future for the reliability and accuracy of the study results and suggestions for advancing this field.

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