Kingston School of Art

HA6101

How does Gentrification within London Impact Society and Sustainability in Design?

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Ba(Hons) Interior Design

Word Count: 7826

2022

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A special thanks to:

Patrick Ellard
For providing me with knowledge I will value for life.

Mum and Dad
For your constant support and guidance. You are my biggest inspiration.

Michaela Warr
For your loyalty, friendship and always being there for a chat.

Maz Haque
For your humor and strength everyday

Introduction:

London's urban environment has been constantly developing since the early 1900s. During this period there was significant growth within London's street markets; it can be argued that this was an early example of retail space. Modern London is consequently made up of a plethora of different architectural styles, each informed by the city's rich history. However, within the last 50 years, architects have been increasingly trying to address the impact cities are having on climate change. Therefore showing a shift towards sustainable architecture, demonstrating the latest addition to the city's diverse infrastructure. 'It is widely accepted that the construction industry has a harmful impact on the environment, economy, and society (Darko, A et al., 2018).

This dissertation will discuss how the positive and negative effects of gentrification impact sustainability and society. It is my contention that understanding the changes an area goes through, during gentrification, will reveal that making more diverse and inclusive spaces will promote technological advancement, education and open-mindedness which are the catalysts for positive economic development, and in turn lead to breakthroughs within sustainable design.

Gentrification enables money to be generated within an area's economy which produces improvements to the infrastructure. These developments enable the experimentation and implementation of sustainable architecture. Although the essential aim for gentrification is to create a better economy, displacement and exclusion are often connected. Gentrification is a term first coined by Ruth Glass to describe 'the middle classes invading long-standing working-class areas of London' (Glass, R, 1963). This process highlights political and class indifference. It also represents globalism, urbanisation and demonstrates the effects of capitalism.

To create sustainable solutions for infrastructure and industry, there needs to be an existing framework to breed innovative solutions, making it more environmentally friendly. London's infrastructure is already strong and has the potential to investigate more sustainable methods. By implementing circular economy techniques, such as repurposing and reusing existing buildings and designing future developments to be flexible and adaptable, London can reduce the amount of construction waste it produces while also finding a new life for disused sites.

'Sustainable cities' are considered to be a way to counteract the negative effects. 'Liveability is the key to a good city' (The Economist Intelligence Unit, 2021). This ideology is undermined by the unsustainability of cities. London was ranked the world's most sustainable city in 2018; this took into account the use of low carbon energy infrastructure, sustainable transport, significant green paces and affordability. However, two major factors were excluded: consumption of goods and services. The worlds 'top cities' account for 18% of all global emissions, and places London 16th. This suggests that to make cities more sustainable, they need to reduce the consumption of goods and services or find innovative solutions to reduce the impact they have on the environment. Furthermore, these methods adapt the way we make cities, producing sustainable architecture.

I will compare the case studies of Embassy Gardens in Nine Elms and Bloomberg Headquarters in order to address displacement and exclusion caused by gentrification and exemplify applications of sustainable urbanisation across London as

a result of gentrification. Therefore demonstrating the positive steps that have been taken to improve the impact cities have on the climate.

The final case study, Eddington, Cambridge is used to describe what the unification of both sustainable architecture and inclusiveness of spaces can achieve when executed with considered, meaningful and purposeful design. Eddington is a residential site developed to attract talented individuals and families such as university students, graduates and key workers, unlike Embassy gardens which is aimed towards higher-income residents. This ultimately produces an inclusive environment allowing ideas to be transferred and improved upon by residents with different experiences and knowledge. This also leads to improvements and breakthroughs in design, while also providing education, within this context it would allow upper, middle and working classes access to the same facilities and knowledge of sustainability, therefore allowing positive sustainable development to be made, benefiting society and the environment.

London is already a powerhouse for diversity, meaning that it already has a suitable base to encourage the inclusivity required to facilitate sustainable innovation. Based on the 2011 census, 69.7% of London's population was estimated to be white British, compared to the rest of the UK which was 16.3% higher. Diversity on this level shows that London has an existing abundance of experience and knowledge amongst its population, therefore integration is required to allow the city to produce the same positive results as Eddington.

Chapter 1: Overview of Gentrification.

Ruth Glass explains in her book 'aspects of change (1964)', that gentrification is used to describe: urbanisation, enraged class division, highlighted political differences while demonstrating the effects of capitalism. However, generally, gentrification aims to create a better economy and allow the area to make more money, essentially by what is considered to be upgrading it. Unfortunately over the years its negative effects are becoming clearer and are impacting more lower-income demographics that cannot compete with the rising prices associated with gentrification, reinforcing Glass's argument. To understand fully the extent of gentrification and to suggest its links to a lack of sustainability within London, this chapter will discuss its history up to date and expand knowledge on its influences, particularly on the working classes and households with lower income.

After the second world war, England entered a stage of social and economical uncertainty. In response to this, Aneurin Bevan the Labour government's health minister at the time, introduced the 'New Towns Act' (1964), in an attempt to restart the economy by building new suburbs surrounding the centre of London. This was done to attract more people to the capital, enabling the growth of new communities. The act proved successful.

By 1949 the 'housing act was established; this removed previous restrictions on people buying public housing in an attempt to increase the number of mortgages sold, therefore providing more income to the housing sector. This increased diversity and shifted social classes to mix within different locations around London since council housing was available to everyone. It was suggested by Richard Florida in the 'New Urban Crisis' that the increased mixing of people could only bring positives to economic development: 'Areas that were successful economically... were those that excelled at the three T's of economic development: technology, talent, and tolerance' (Florida, R, 2017). Florida then goes on to suggest that 'successful' cities are open-minded, allowing them to attract talent from members of society that were never normally given the chance, for example: members of the LGBTQ communities, women, people of different races, ethnicities and lastly, the working class. The housing act, however, had quite the opposite effect, and encouraged middle-class members of the community to move into the newly built suburbs and therefore leave the centre of London to the working classes and migrants who moved overseas to help rebuild the city after the blitz.

Before 1960, London's economy was predominantly supported by industrial means, despite this, the new generation of 'baby boomers' produced a societal shift, whereby the economy moved more towards the service sector. This meant that better education was provided for the working classes, and caused an even larger class shift as more of the population repositioned into the middle classes, and brought forth the first waves of 'gentrifiers'.

Glass labels the first wave of 'gentrifiers' as the 'pioneers'. Often Low- income and marginalised groups such as members of the creative class, were now able to move up through careers with more ease as London was becoming a more tolerant city. The promotion by the government to own property continued into the 1970s, with the deregulation of the credit market. This meant that it was significantly easier to get credit and buy a property; consequently leading to an increase in housing sales and a decrease in council housing builds. By 1979, acting prime minister, Margaret Thatcher, was continuing to encourage a 'property owning democracy' (Amit, R, 2008.), By announcing the right to buy scheme in 1980, council tenants could purchase their own

homes; inducing the revival of the private rented sector and allowing a property to become an investment for the first time because of the increased rate of return.

The second wave of gentrifiers appeared during the start of the 1980s. They have been described as highly educated, paid and skilled professionals, learning from their previous generation and benefiting from the opportunities given to them by a service-based economy. The 1980's also marked a change in the way gentrification was perceived. Before this, the term was only used to describe individual household scenarios; whereas after this time it was used to describe a whole-scale generation of entire neighbourhoods around London, therefore, causing the gentrification that we know today. The third wave of gentrifiers occurred during the 1990s. They 'could be traced back to a post recession era [...] which witnessed 'the return of gentrification' where the role of large scale capital appeared greater than ever and developers redeveloped whole urban neighbourhoods.' (Tallon, A, 2021).

In more recent years, gentrification seems to have accelerated, impacting more of London's boroughs. Figure one demonstrates the parts that are the most affected in dark red, particularly seen nearer the centre of London and less on the outskirts. This map was made from data collected from 2010 to 2016 but already suggests that gentrification has expanded out from the centre, spreading to reach the outermost boroughs such as Newham. In more recent years, changes can be seen in these boroughs, 'The London borough that has become "gentrified" the most is Tower Hamlets, on the City Fringe, with neighbouring Newham third on the list, according to year-long research by the Runnymede Trust think tank (Brooke, M., 2021). Newham has one of the lowest income demographics in London with long-standing, working-class members of the community suffering from a lack of money; the prospect of gentrification occurring here suggests that this community will ultimately get displaced, 'Regeneration should not come at the expense of working-class communities which are essential to daily life' (Brooke, M, 2021).

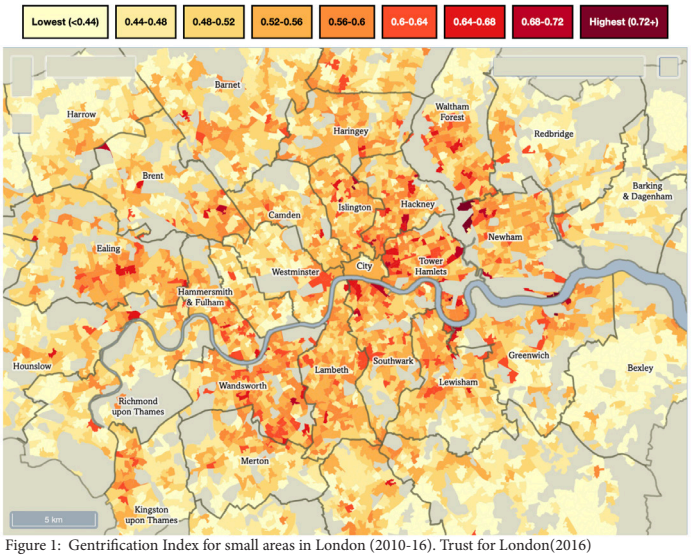

Figure 1: Gentrification Index for small areas in London (2010-16). Trust for London(2016)

Significant changes can also be seen within the southwest of London. The Royal Borough of Kingston upon Thames, as an example, has recently approved planning permission to demolish and redevelop Cambridge Road estates. 'Residents are terrified by what is going to happen, social cleansing, forced out of homes by developers.'(Cambridge, E, 2015). This residential development houses the largest concentration of working-class, low-income households within the entire borough; and like Newham's poorer demographics are likely to also be displaced, due to the increased living cost gentrification brings to an area.

The theme of displacement and class division will be explored further in chapter two; alongside investigating the impact regeneration at this scale is having on the environment. The demolition of Cambridge estate, a development that was only built 40 years prior, is a good example of creating unnecessary construction waste and therefore highlights an issue with architects and urban planners not looking into the complete life cycle of a building.

Chapter 2: Gentrification, Urban Planning and its Effects on Sustainability.

Cities have an ever-growing population, currently, an estimated 9.4 million people live in London, this has created a new challenge for urban planners and architects to address suitable ways to house everyone. This chapter will explore: how population, demographics and the housing sector has impacted gentrification, and how unsuccessful solutions to this problem have accelerated the speed of gentrification, caused further class divides around London as well as, discuss how this is linked to a lack of sustainability. Themes such as displacement, segregation and the phrase 'poor door' will be explored in-depth to address the effect of inequality and sustainability.

There is a serious lack of affordable housing within the UK and specifically within London; this problem is linked to drastic population fluctuations over the previous decades. Although Europe's population has been expected to decrease from 729 million in 1999 to an estimated 701 million in 2025 due to natural changes, migration has rapidly altered population figures. However, when looking into external factors such as household sizes this data becomes less reliable. In addition to this, the UK has been experiencing a societal shift towards smaller households, with more people choosing to live in one-person households. This is reflected in UK household statistics, showing an increase of 2 million households from 1991 to 2006.

The lifestyle changes that also caused this shift towards smaller households, has in turn increased the rate of gentrification around London. As young professionals generally are more career-driven and less likely to settle down and start families, they, therefore, are attracted to London due to the excessive amount of opportunities open to them. This in turn generates income for London's economy and creates an incentive for them to expand to accommodate the demand. In contrast to the suburbs which are seen as less desirable with a lack of hope for people's work, social and leisure experiences. 'Students and young people were well represented and attracted by convenience and buzz. It has also been argued that city centre living is not appropriate for families that prefer the space and better services of the suburbs.' (Tallon, A, 2021). Because gentrification attracts these types of people, it demonstrates that supply sided motivation is the drive. The rent gap theory first discovered by Neil smith (1996) emphasises this further. It suggests that gentrification of an area first starts when the rent prices of a particular area grow significantly; this is done to appeal to developers to improve the overall infrastructure of the area. Therefore it benefits homeowners and developers, however, it affects the poorer members of the community who consequently become displaced.

East London is considered to be one of the last areas to become gentrified within the city. 'Class mobility, suburbanization, aspiration and ethnic change have been the key factors in understanding change across East London over the past 40 years and that gentrification has only been one among a number of changes in the overall process of social and economic change.' (Butler, T, 2013). Moreover, Newham located East of the city is suggested to make up one of the poorest demographics in London as well as having 19% fewer students of higher education than the national average, suggesting a largely working-class and low income demographic. When considering gentrification occurring here, a significant amount of the current population would not be able to afford a rise in living costs associated with a drastic increase in the economy.

In contrast to this, Victoria Park, located close to Newham, is an example of a more gentrified area. Upon a study conducted

Figure 2: Property valuation for 183A Victoria Park Road, London, Hackney, Greater London, E9 7JN. The move market (2022)

by Tim Butler in 2013, it was concluded that it also had the highest number of graduates, around 17% higher than average and overall had established professional careers. This illustrates the gentrified nature, further reinforced by beautiful Georgian architecture (seen in figure 2), pleasant urban areas and generous access to green spaces. Gentrification was suggested to have begun here during the late 1970s when a major landlord took advantage of the rising house prices and sold his estate for a larger profit. This sale ultimately benefited the economy and attracted high-income homeowners to the area. Consequently, enabling the redevelopment of Victoria park and producing displacement pressure upon the previous community. Residents could no longer compete with the rising living costs that the developments were initiating and it has been suggested they have moved to neighbouring Chigwell and Essex.

'Displacement is central to many definitions of gentrification, but from the 1980's 'itself got displaced from the gentrification literature' (Slater, T, 2006.). This was due to the two themes not being linked until the early 2000s when increased studies on post-industrial development recognised a connection. However, it was argued that gentrification on post-industrial buildings or brownfield sites (further discussed in chapter three) was referred to as a 'clean social slate' (Hammett, C., Whitelegg, D., 2007.), consequently, many opinions on the subject arose as to how regenerating a post-industrial building could displace residents, including that gentrification did the opposite by creating more jobs. In contrast to this, others stated that it would be impossible to have gentrification without displacement. If gentrification was said to be "given enough elasticity" it should address "the mutation of the process itself" (Davidson, M. Lees, L, 2005) 'elasticity results in concepts lacking meaning and usefulness.' (Lambert, C. Boddy, M, 2002). Thirdly, 'assertions that there could be gentrification without displacement was to question its ontological validity. In part, this questioning proceeded empirically, with studies highlighting instances where new-build developments were associated with displacement.' (Phillips, M. et al. 2021). After these debates continued, people started to question more potential ways to produce gentrification without displacement. This led to the understanding and classifying of its different forms: Direct last resident displacement, direct chain displacement and off-site displacement; which is the most common to affect low-income households within gentrified areas. It indicates that: exclusionary displacement "where lower-income groups are unable to access property because of the gentrification of the neighbourhood" (Liu, L et al, 2017). The next form of displacement refers to the drastic change within the aesthetic and atmosphere of a community, as a consequence, prior residents no longer recognise or connect with it and in turn, become displaced. Lastly, displacement pressure refers to the pressures of living in a neighbourhood with rising living costs and as a consequence can now no longer afford to live within the area.

Displacement like this can cause 'hidden homelessness'; referring to working-class people with little to no income, living in either temporary accommodation or staying with family or friends, often meaning that there's a large number of people living in a small accommodation. This can be caused mainly by either a lack of house availability or affordability. The documentary 'evicted' aired by BBC, follows families struggling with hidden homelessness. It portrays a low-income family that was evicted from their home due to the landlord selling the property, the documentary then proceeds to follow the family forced to share a 2 bedroom house with their friends, meaning 9 people in total, and their struggles to not only just look for a new home but also arrange temporary accommodation in the meantime. It portrays perfectly the impact of gentrification, with the increased house prices playing a role in why the family was evicted in the first place, then moved 24 miles for temporary accommodation in a bed and breakfast and demonstrates the impact location has on gentrification and displacement.

The private housing sector makes profits supplying the demand for housing and this, in theory, should fill the gap by providing homes to those who need them, however, many residential developments don't supply affordable options; to increase profits the homes are targeted to those with higher income. The issue is the private sector responds to the demand over the need. Secondly, the location of residential builds becomes a challenge for those needing housing. The housing sector doesn't control the locations of new house building sites, this is because generally building companies bank buy cheap land, putting pressure on them to meet the demand of the quantity and yet again not the need.

It is generally found that people within the same income bracket get banded together demographically; this then impacts the economy of the area. Because of this segregation, inequality is emphasised causing tension that can be felt all over London. This theme is highlighted within apartment developments. For a new upmarket apartment building to get approved planning permission, it is required to offer affordable housing. However, developers have started designing alternative access for these affordable apartments, this has been dubbed 'the poor door'. '"When Ken Livingstone left office he was keen that all developments should have their social housing 'pepper potted' – mixed in with all the other more upmarket accommodation," said Ed Mead (Osborne, H, 2014). This was done to combat segregation, however often the affordable apartments are given separate entrances, fewer facilities to use also and in some cases a division of post and bin collections. This is all done to prevent social class mixing. Darren Johnson said: "This trend shows contempt for ordinary people, and is about developers selling luxury flats to rich investors who don't want to mix with local people." (Osborne, H, 2014)

Between Vauxhall Cross and Battersea power station, a residential development known as Nine Elms (VBNE) is being considered an opportunities area. It 'has been trumpeted as 'the biggest regeneration project in Europe' (Wainwright, O. 2021) Embassy Gardens, a housing development located within the opportunity area, designed by HAL Architects will be used as a case study to demonstrate the impacts housing developments like this have on society and the environment.

'Embassy Gardens' is a mixed-use development, which has spearheaded the Nine Elms' regeneration, delivered by Ballymore (phases one & three) and EcoWorld Ballymore (phase two)'. (NLA, 2021) . The buildings have been designed around raised courtyards with varying heights to maximise natural light to every apartment, and also to prevent overshadowing and overlooking. The site also included the world's first suspended swimming pool known as the sky pool, constructed out of 20 centimetres thick acrylic. The design takes inspiration from the meatpacking district located in New York, suggesting the development was designed to attract international residents since it is conveniently located next to the US Embassy;

demonstrated in the brick facades oak parquet flooring, marbled bathrooms and the floor to ceiling windows seen in all the apartments. The development also included landscaped gardens and a riverfront walkway that connects to Battersea Park. However, upon observation, the overall development lacks diversity and as a result, has a characterless atmosphere. This potentially could be due to its exclusiveness and lack of integration, emphasised by the segregation of their affordable housing. 'We are strategically excluded from being part of the community,' said Jason Owusu-Frimpong, who lives in a part of The Residence facing the railway line, managed by housing association L&Q. "We would happily pay for a gym membership if we were allowed to, but the management says it's not for us. Meanwhile, the car park they told us was only for disabled use is now being sold off to wealthy international residents." (Wainwright, O, 2021)

The division is reflected in the design of the buildings, streets and public areas. Reinforced by the use of separate entrances (poor doors), the location of affordable housing, situated next to the railway line behind garages and service facilities, and finally by the lack of care taken to design the lobby of the affordable house as seen in figure 3 (left), bare white walls, basic lighting fixtures and no aesthetic features are starkly contrasted to the private housing lobby; shown in figure 3 (right). Iconsists of a contemporary and modern style, designed by Benningen and Lloyd. This demonstrates a 'new form of social apartheid on an industrial scale' (Wainwright, O, 2021) as affordable residents feel they are 'excluded from community events and never consulted concerning anything going on in the development. Ballymore regularly disregards any form of considerate constructors' code and creates an eyesore of construction waste, noise pollution and many other inconveniences. (Real_ Embasseygardens, 2020) as stated on the Instagram page 'real_embasseygardens' set up entirely to uncover the truth of living in the affordable housing part of the development.

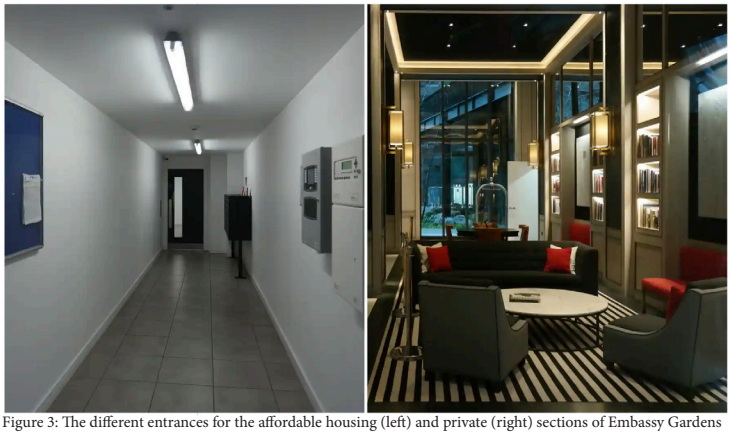

Figure 3: The different entrances for the affordable housing (left) and private (right) sections of Embassy Gardens Photograph. Wainwright, O. (2021)

'Competing stacks of luxury flats have sprouted along the river, replacing the elm trees that once stood here with a forest of concrete and cladding, a garish collage of mirrored glass, coloured plastic panels and fake bricks. (Wainwright, O, 2021), although Ballymore proposes that Embassy Gardens promotes sustainability through its cycle workshop incentives, there is a lot to suggest otherwise. Firstly, the suspended pool is constructed using acrylic plastic which is known for its non-degrading properties and polluting construction process. Secondly, there are perhaps too many spaces within the site aimed at the consumption of goods such as retail spaces; these, as mentioned in the introduction, contribute significantly to the unsustainability of London. Lastly, the unrealistic prices and location of the site suggest it is targeting higher class, international residents, as a consequence the apartments are left vacant a lot of the time, consuming energy to power the building with little to no use most of the year.

Embassy Gardens has been designed with luxury at the heart of aesthetics; the use of new oak flooring instead of reclaimed on this scale is severely damaging and contributes to deforestation, while the marble bathrooms require a detrimental extraction

and manufacturing process which also harms the environment. This, therefore, suggests that sustainability was not prominent in the concept of the design, however, the Embassy Gardens could be considered as adaptable, considering the range of spaces built from offices to homes, bars and shops; this in terms of the site's life-cycle means it has the potential to change to future demands and therefore won't produce as much waste becoming a demolition site.

To conclude, this chapter has addressed: how the shift to smaller household sizes is detrimental to the environment. When people live separately, it requires more energy to facilitate more homes; whereas shared households or larger households share the energy of one home in return, reducing consumption. The attraction to cities over suburbs has been also been explored, indicating that population density has contributed to making them the largest polluters, consumers and catalysts for gentrification, highlighted by the government's inability to house everyone, and the amount of regeneration occurring around London, seen to be spreading from the centre out. Displacement is closely connected to gentrification. Caused by rising living costs associated with gentrification. Embassy Gardens exemplified how inequality and segregation was produced by the site through notions such as the poor door. In chapter three, this dissertation will begin to explore ways in which designers are creating innovative designs and technologies to reduce the negative effects of gentrification and also redevelop London to become a more sustainable environment.

Chapter 3: Recent Developments in Sustainable Urban Planning

Architects and urban planners within London are addressing the concept of sustainable cities that balance the needs of the environment, economic growth and future generations. 'The notion of sustainable development has rapidly become centre place in the governance of cities, and there are few policy makers who do not refer to it or use it as part of strategic policy making and implementation.'(Lees, L. Imrie, R, 2014). This chapter will explore what London is doing to become a better place to live while researching the designs and technologies developed to reduce its environmental impact. This will as a result highlight how to tackle the negative effects of gentrification, in turn reducing displacement, segregation and social class division.

One of the fundamental aspects of creating a sustainable city is inclusivity.'Social mix policies have had one dominant objective, to de-concentrate or dilute large concentrations of low-income/poor households.' (Lees, L. Imrie, R, 2014). Lees describes why diversity is important, it enables equality within the economies of local areas, preventing what you're seeing today in modern London where there are clear divisions between social classes, reflected in not only the architecture but also in the banding together of classes. Secondly, 'Mayor, Ken Livingstone, (2004), notes that London's future depended on enhancing 'its economic and business efficiency ... accompanied by strong improvements in the quality of life and environment and greater social and economic inclusion.'(Lees, L. Imrie, R, 2014); demonstrates how inclusion is detrimental to allowing experiences and knowledge to be shared. This in turn produces technological breakthroughs quicker and therefore has the potential to expand thinking upon sustainable architecture.

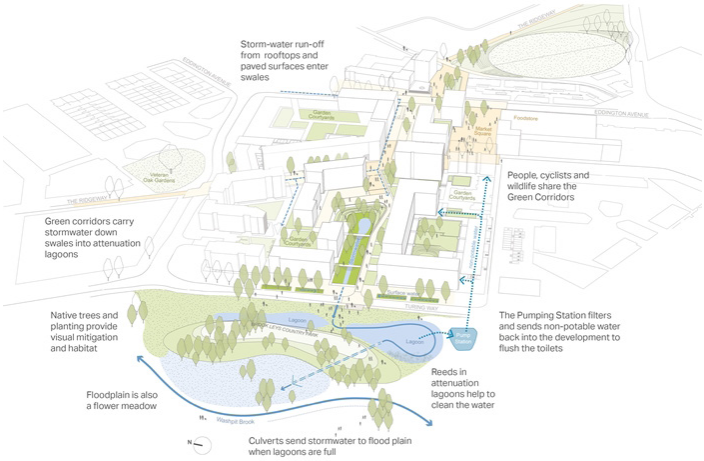

Figure 4: Eddington Master plan EACOM Design and Planning. (2021)

Eddington (can be seen in figure 4) is a project that demonstrates this well. Situated in Cambridge; within walking distance of the university, it is a residential development that is successfully addressing the issues surrounding exclusion. "It is an exceptional achievement as a piece of new town-making, containing myriad lessons on good practice - developer/local authority co-operation, collaborative design working, integration of a green agenda that will be drawn on by other schemes long into the future." (Wilson, R, 2018)

What makes this Eddington so successful, is the implementation of strategies such as; targeting homeowners that can provide talent to the local areas like key workers, students and graduates. The belief in targeting these groups is to allow Cambridge to flourish through an abundance of diversity and cultures. Ultimately benefiting the entire area by allowing new research to take place in the 100,000 sq m of academic research and development space by the young professionals that live there. 40% of the space is set aside for private or independent research projects, providing there's an existing connection with the university. The targeting of talent over finances is what allows Eddington to become a successful and inclusive site.

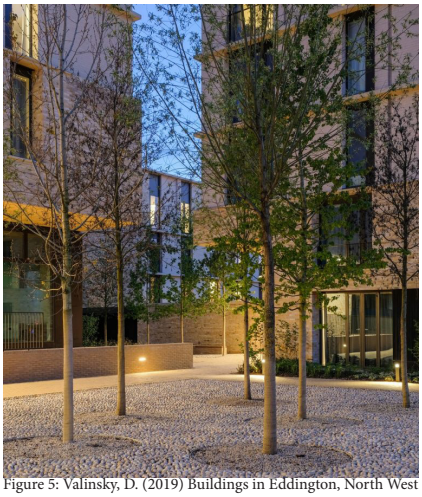

Figure 5: Valinsky, D. (2019) Buildings in Eddington, North West Cambridge

Inclusiveness can also be seen within the architecture. The architect, Stanton Williams reinforced this notion of bringing the community together through the design layout. 'The urban approach of 'loose' interconnected courtyards is very successful and creates a delightful series of spaces.'(Welsh, A, 2021). The Interwoven style allows for passive surveillance and social interaction. Landscaped courts bring integration of hard and soft surfaces, making the whole site feel connected as seen in figure 5. One-third of the site is open to the public, this provides a suitable atmosphere for neighbours to collaborate and exchange conversations, While reinforcing the development's aims to create an intertwined and holistic community.

Eddington communicates integration and encourages connections between the public and residents through its links to Cambridge University and the on-site facilities such as Eddington's only civic hall. It encompasses a community centre and nursery. The dual identity of this building will be the key to its longevity. It surrounds the lives of its residents from their youngest through to the oldest, catering to the needs of all and in turn becoming the centre of the community. It shows adaptability, not just to secure its future, but also to accommodate the needs of its growing community while being equipped to harbour changes in its demands. The civic hall encourages interactions through its tactile design. One of the best examples of this is shown in figure 6, the brickwork has been eloquently designed to playfully manipulate light onto the walls. Meanwhile figure 7 depicts the outside of the building, 'With their seats formed of fossilised Purbeck grub stone, these benches offer an invitation for people to engage with the building – whether waiting to collect kids, resting from shopping or watching the world go by – a human-scaled threshold to these buildings which touches the life of the city around.' (Wilson, R, 2018). It also makes use of large alluring yet inviting windows, appropriately yet loosely shrouded by the facade seen in figure 8.

Figure 6: North West Cambridge: MUMA adds a sense of community Wilson, R. (2018)

Figure 7: North West Cambridge: MUMA adds a sense of community Wilson, R. (2018)

Figure 8: North West Cambridge: MUMA adds a sense of community Wilson, R. (2018)

Consequently, the implementation of all of these strategies have allowed for social groups to mix without the associations of displacement and exclusion; taking the benefits of gentrification whilst removing the negatives. Suggesting that if more of London's developments targeted homeowners based on integration and the sharing of knowledge then the amount of displacement could be dramatically decreased. Gavin Henderson, Principal Director of Stanton Williams, commented: "Our designs build upon the principle of a 'network of spaces,' differentiated in scale and character, that together create an engaging public realm analogous to the traditional city." (Welsh, A, 2021)

Eddington also aims to approach the lack of affordable housing around the area in a sustainable, ambitious and long-lasting way. It has implemented a variety of innovative and new sustainable technologies including; the UK's largest site-wide rainwater harvesting and recycling system. It works by channelling water through the rooftops, all to be collected within the lake; it is then treated and reused for toilets and washing machines. The incorporation of a lake (as seen in figure 9) also reduces the risk of flooding by having a suitable way to store excess water. It creates a habitat for local ecology and encourages new wild and plant life to increase biodiversity while remaining a pleasant landscape for the residents. Because Eddington implements this technology it has been seen that its occupants are using on average 70 litres less of water per day.

Figure 9: Key worker Housing, Eddington Cambridge. (Hobhouse, J. (2022)

The developers were careful in their intention of incorporating a water harvesting system like this. Water reuse schemes tend to use more carbon through the process of treating and pumping than traditional water main infrastructure. However, Cambridge is known to become water-stressed in previous summers, therefore having a system like this was considered the best option. Although, if London were to manufacture a rainwater harvesting system like this, to scale it up to meet demand more research would likely need to be done to produce a system that is more carbon-friendly than what we have today. Nevertheless, there is still the potential to start preparing our infrastructure now for future technology like this, for example; when repairs are done to water lines within London, adjustments can be made to prevent more disturbance when the time comes to install it and will inevitably encourage city planners to promote sustainable research. 'Sustainability concerns also inform the desire to influence the overall shape of urban areas, their urban form.'(Rydin, Y, 2011,). Yet as discussed in chapter 2, the societal shift towards smaller house sizes is in turn producing more consumption waste. Eddington has also found a viable way to combat this. The technology incorporated into Eddington homes allows them to all be heated individually, while all being powered from the same source; it is then distributed by a district heating network producing an effective reduction in energy usage.

The value placed in England's green spaces, therefore means that cities are becoming more densely populated in an attempt to conserve agricultural land, develop urban planning methods, protect the countryside and diversify the identity of each city. As a result of this, buildings are more tightly packed together meaning a district heating line could easily be introduced into London, as a potential way to make the city greener while responding to the shift towards smaller households. "Conservation policies in rural and urban areas ... tend to be inherently conservative. They look back to past times rather than forwards to the needs of future generations and this may impinge on how efforts towards sustainability proceed." (Rydin, Y, 2011,). What Rydin meant by this is that to truly design a sustainable building, the architect needs to anticipate and accommodate future adaptations; by predicting the life-cycle of the building through to its end of life. Technology is constantly developing, if buildings can keep up with these advances, then architects need to make them adaptable. From past examples of urban planning, it is clear that very rarely is the life-cycle of the site taken into account. This creates challenges in the future of household size differences and keeping up with sustainable technology. For example, many older roofs don't allow for the installation of solar panels. Therefore, to tackle this problem designers need to: advance sustainable technology to be adapted to older buildings, and anticipate the future life-cycle of their builds whilst designing adaptable and purposeful architecture.

Eddington also successfully demonstrates meaningful and purposeful design by anticipating the further needs of the residence and accommodations to meet the demands of the future. The developers have thought about the longevity of the development, as shown by the incorporation of the main water line, in conjunction with its water harvesting strategy. If in the future there is a water shortage or the site expands in size and needs to cater for more residents, the infrastructure is already in place, preventing the need to dig up roads causing disruption and waste. This type of design is known as patient capital. Overall Eddington has been designed with a timeless charm that seemingly will never age, yet can still accommodate and adapt to the changes in its residence, environment and demands of the future.

An increased lifespan is promoted strongly by BREEAM, an assessment method used by urban planners to rate how sustainable a site is. 'It recognises and reflects the value in higher performing assets across the built environment lifecycle, from new construction to reuse and refurbishment.' (BREEAM, 2022). BREEAM has created ratings based on a site's ability to meet sustainable criteria. Eddington successfully meets the physical criteria; for example, a reduction in energy and water usage, as well as incorporating its efficient recycling system consisting of Underground chutes, which replace traditional wheelie bins. also. This could be because it encourages architects to address more of the criteria such as health and well-being, innovation and land use. By creating healthy working and living environments, there is ultimately an extension in the site's usefulness which expands its longevity. The top 75% of UK new (non-domestic) buildings, which are considered to be working at the standard practice, are marked as pass level. Only the top 10% are awarded Level 5; the award received by Eddington; demonstrating the thoughtful and purposeful thinking behind its sustainable technologies, inclusiveness and expansion of a site's life have all contributed to creating an excellent residential site. If London were to address its social and environmental issues with the same resolve then the City has the same potential as Eddington.

In contrast, gentrification can also have a positive impact on sustainability due to its popular reuse of existing buildings. This takes into account a building's entire life cycle, giving old disused sites a new life, reducing the materials and carbon emissions created with the construction process. 'Comparing the sustainability of a conversion with demolition and new-build depends ultimately on the longevity of the building itself. The life span is difficult to ascertain as it involves predictions about

demand and use over time'(Remøy, H. van der Voordt, T, 2014). 'To facilitate future conversions, developers and architects should incorporate change of use adaptability as an important issue in briefing and design' (Remøy, H. van der Voordt, T, 2014). Therefore, it demonstrates that adaptive reuse within a design is important in creating a stable structure to house activities in contrast to modern thinking where buildings are manufactured for a specific purpose. As the demands of the population change so should the building.

Although, architects and urban planners are in recent years designing innovative ways to make new developments more sustainable; less research and effort has been made to reduce energy consumption within existing sites. Retrofit solutions such as wall/ loft insulation and double glazed windows can all be fitted to older buildings that have a positive sustainable impact. The issue however is that residents with lower income cannot always afford to make such amendments to their homes. Gentrification plays a massive role in increasing the gap between the rich and the poor. Once gentrification occurs within an area of London, the price of living rises but wages don't. Low-income families, therefore, are less concerned with the sustainability of their homes.

Introducing retrofits with an area-based approach would bring strong regulations enforced by local planning boards, ensure all work is done to higher quality and provide reassurance to homeowners that are otherwise unsure of having retrofits. Equipment such as insulation and solar panels can also be bought at a cheaper price due to bulk buying; this would reduce the costs of the fitting, making sustainability more feasible for low-income households within gentrified areas. A larger labour force would be required, and this, in turn, would create new jobs within the local area and ultimately boost the economy. Lastly, the investments made to the individual households would feed back into the property value, bridging the gap between classes that gentrification has created. Therefore, the promotion of this could potentially encourage more households to install retrofits and entice a lower-income demographic to opt for more sustainable means of energy.

In England, there are financial incentives whereby homeowners are awarded above-market prices for any renewable electricity produced on-site. However, there have been very few homeowners to take advantage of. This suggests that homeowners have either a lack of information on the process, are concerned by the disturbance they could create or are unsure of the quality of the finish due to a lack of regulation. The incentive also seems to be more concerned with solutions such as micro wind turbines and solar panels. These solutions have carbon emission reduction benefits, however are very visible and have the potential to cause disturbances; moreover promoting invisible solutions such as wall and loft insulation may be more practical, effective and inviting to homeowners.

'The eco-towns model aims to incorporate elements of environmentally, socially and economically sustainable design and was proposed as modern-day new towns' (Tallon, A, 2021). This approach was set to start its planning stages in 2007, where 57 sites were identified as suitable, however, it was projected that 5 would be built by 2016 and 10 by 2020 and by 2012, only four sites had been approved, with none completed. The sites would be judged against the zero carbon and environmental standard criteria; these included: sustainable travel, design quality and the use of brownfield land, consisting of often abandoned or derelict areas in towns or cities, usually previously used for industrial or commercial purposes such as; old army barracks and airports. However, the eco-towns were 'viewed by protesters as practices of social cleansing' (Phillips, M. et al, 2021). The utilisation of disused land showed potential in improving sustainable development, however, neighbouring residences of

these brownfield sites were opposed strongly from early stages, as well as critics commenting on the sustainability aspects of the plans, arguing that some sites were originally proposed green belt or greenfield land. It was also suggested that these sites would not be large enough or diverse enough to sustain a viable transport network, therefore creating more car pollution. The extent that these developments have contributed to more sustainable developments has still yet to be seen.

Figure 10: The ceiling took 38,000 collective hours of design work to perfect;. (SAS International. (N.D.))

Gentrification can benefit the innovation of sustainable design. More money being generated within an economy means more funding for researching, designing and implementing sustainable architecture. It also allows for regeneration to happen, which gives architects the creative freedom to experiment with sustainable architecture as demonstrated by Bloomberg headquarters; The world's most sustainable building. It contains: an integrated petal designed ceiling, (figure 10) used to regulate the temperature within, therefore reducing consumption. LED lighting has also been incorporated, this, in turn, lessens the energy usage by a further 40%.

Similarly to Eddington, Bloomberg also harvests rainwater by collecting and storing it on the roof. It is then treated internally and used for toilets and watering its living wall; which helps to purify the site's air by absorbing pollution and increasing levels of oxygen. It also acts as a good insulator helping to further decrease the building energy consumption.

To conclude, this chapter has explained some of the many strategies designed by architects to make buildings more sustainable. By utilising previous materials, reducing consumption and creating an inclusive environment, urban spaces like London can become more sustainable. Since London already has a strong infrastructure and gentrification lends itself to adaptive reuse, this chapter has also described what can be done to reduce the consumption of existing buildings.

Conclusion

In summary, this dissertation has broken down, researched and explained the link that gentrification has to sustainability and society within modern-day London. To do this, research was done into the history of gentrification to understand how it has developed into the profitable yet exclusionary process it is known to be today. 'Gentrification had become an empty-signifier lacking any "precise, anchoring empirical reference". (Lui, L, 2017).

Embassy Gardens, located in Nine Elms has been used as a case study to describe the negative themes of displacement and exclusion felt by many working-class members of London. The separation of social classes explained through the use of the poor door, denied access to facilities and lack of care put into the construction of affordable housing had led to segregation and tension within the community. It represents the extremities of social class division in London brought forward by the gentrification of the surrounding area of Battersea and Vauxhall.

While the construction industry remains to be one of the largest contributors to global warming, this dissertation has discussed the solutions being designed to reduce its impact. By considering the life cycle of buildings, this dissertation has deduced that gentrification has encouraged designers to adapt existing buildings, due to the popularity of these sites with people. This helps to reduce the amount of material used in construction as well as reduce the waste associated with demolition. Finally, it protects historic buildings that would otherwise stay abandoned and gives them a platform to be reused and celebrated, whilst also providing London's architecture with a deep historic value.

Although, through this process, issues were addressed with existing sites not always lending themselves to the installation of sustainable technologies. In response to this, Retrofits are proposed to reduce consumption and generate renewable energy for existing buildings that are less sustainable. All of this combines to argue that designers and architects need to accommodate the changes within the building's life cycle within the construction of future sites and refurbishment to existing sites.

The case Study Eddington has expressed that diversity and inclusiveness of spaces lead to advancements in technological development, education and open-mindedness; while Richard Florida considered these to be the three 'T's' of economic development; this dissertation has concluded that if implemented purposefully can be the building blocks to a successful sustainable and inclusive community. However, it has also been addressed how in previous attempts of social mixing this same theory can cause even further segregation highlighted through the occurrence of the 'poor door'.

Eddington has also produced innovative 'green' technologies which could be used essentially as a prototype to show how London could improve its existing infrastructure. If it were to do so, we would see a dramatic decline in energy waste due to communal heating solutions, a reduction in the use of mainline water systems due to the implementation of rainwater harvesting, and an increase in renewable energy sources such as solar panels and wind turbines.

This dissertation has also approached what is considered to be 'sustainable gentrification' as seen through the case study Bloomberg Headquarters. This highlighted that although gentrification is generally seen as a negative, the economic

impacts and encouragement to develop cities creates perfect circumstances to increase and implement sustainable solutions. Bloomberg has become a front runner in what sustainable design should be.

The assumption is that gentrification benefits the economy and causes disadvantages to society; however, this dissertation has concluded that by removing the exclusion through targeting talent over money. Gentrification can be good for those it encompasses by breeding innovation, this, in turn, will allow for an ultimately sustainable and inclusive future for London.

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