GLOBAL GOAL NUMBER 11: SUSTAINABLE CITIES AND COMMUNITIES- ARE WE DOING ENOUGH?

Our planet is heating. A known fact. Animals are dying due to their habitats being destroyed. We're all aware. Sea levels are rising; natural disasters are increasing; the fossil fuels are running out; we have heard it all before; but how can we help on a large scale? We are told to turn off our lights, take shorter showers, travel less, turn vegan: all valid and important pieces of advice but what we have not heard are the solutions on a city-wide scale. How can we make ourselves and, more importantly, our cities sustainable? How can we reverse our actions and how do we stop ourselves from falling further down this slippery slope of suffocating our planet in clouds of greenhouse gasses?

Goal 11 has endless potential for solutions and for this reason, I believe it to be one of the best targets. It aims to "make cities and human settlements inclusive, safe, resilient, and sustainable", through innovative architecture that combines inventive design with modern sustainable materials. Goal 11 has 10 targets, but I will be focusing on the following 6 in this essay:

- 11.1- Safe and affordable housing
- 11.3- Inclusive and sustainable housing
- 11.4- Protect the world's cultural and natural heritage
- 11.5- Reduce the adverse effects of natural disasters
- 11.6- Reduce the environmental impact of cities
- 11.7- Provide access to safe and inclusive green and public spaces.

Target 11.1 plans to ensure that everyone has access to "adequate, safe and affordable housing" by 2030. The human population has grown at a rapid rate in the past century and is projected to reach 9 billion by 2040. As a result, resources are becoming strained, especially in the housing sector. This observation is particularly evident in cities, where there is an imbalance between the accommodation available and the sheer number of people that need them, hence, house prices are at an all-time high currently and will continue increase exponentially. In a bid to house more of the growing population, low-quality apartment buildings and houses are being built with little to no room and astronomical prices. The people most affected by this housing crisis are young adults and families who have no choice but to grapple with a crippling debt to live independently. Additionally, such quick builds are often made with cheap, substandard housing materials that are not made to last. Inevitably, this leads to a lack of durability and safety, which forces the owners to cough up unaffordable repair costs. An example of such a building includes the vertical slums in Mumbai, India, made to accommodate a large portion of people living in the Dharavi slum. The Dharavi slum is one of Asia's largest urban slums and is home to approximately 1 million people. These buildings consisted of small rooms stacked on top of each other which, in theory, had the intent to house as many people as possible but, instead, resulted in poorer living conditions than that of the slums. The residents were confined and packed into minuscule, concrete rooms without basic living facilities or ventilation which then led to these buildings becoming "upright slums".

The example of the upright slums also presents the current issues that goal 11.3 aims to tackle. It shows how people of less fortune are treated and are expected to live, in tiny, minuscule housing barely fit for humans, crumbling with their every step. We can see this not only in shanty towns and slums but also closer to home, in council housing and apartments with low quality materials, such as flammable cladding on the outside of these buildings. This is a safety hazard and is more common than it is recognised A well-known and harrowing example of such a situation is the tragedy Grenfell tower fire, which affected thousands of people. In addition, there is a lack of inclusivity in these settlements too, not only for people with lower incomes but also for individuals who live with

disabilities. These quick builds often give little to no thought to people with such requirements such communities, having staircase after staircase, small and hard to manoeuvre lifts and no ramps or disability parking. This causes a large portion of people to be excluded from finding housing as they are simply not thought about and places that include their needs are typically priced higher due to more space and specialist equipment being needed. Such exclusion makes it extremely difficult for these residents to find appropriate housing with appropriate prices. Any accommodation that does cater to them is unaffordable due to the specialist equipment that has been installed. Evidently, cheap, and quick attempts to house masses of population This shows how these quick attempts to house masses of the population are not the long-term solution and can lead to more problems in the future and more people being at a disadvantage.

Smart design is inherently the solution and, already, small steps have been made to try to tackle the housing crisis. Goldsmith Street in Norwich, is an environmentally conscious social housing scheme, is described as good, ordinary, resilient, and low energy housing. It is a collection of high-quality council houses that focus on simple, good design built to last lifetimes. Settlements like these highlight another option for housing without compromising on safety, durability or functionality as opposed to current cheap, low quality high rises. Good design does not necessarily mean inventing something new and Goldsmith Street proves shows this perfectly with their stripped-back approach.

The 10 principles for good design, or the 10 commandments of design as they are more fondly known, were created by Dieter Rams and while he designed products, I believe these should apply to everything. Architecture, in my eyes, needs should strive to be worthwhile, meaningful, and honest. It must solve its purpose and go above and beyond to do more. These principles, in my opinion, are the solution to goal 11.5- reduce the adverse effects of natural disasters. Another of the many side effects of climate change is the increase in natural disasters due to the rising temperatures. Natural disasters such as earthquakes, hurricanes, tsunamis and so on, have devastating impacts on not only the land but also on the people living in the area. By 2030, goal 11.5 wants to reduce the number of deaths and people affected by such disasters while also decreasing the impact these disasters have on the economy. Each year natural disasters cause $210 billion worth of damage and takes years for the areas to rebuild and recover. The way to achieve this goal is through natural disaster proof architecture. Solutions such as creating buildings with flexible foundations which lift the buildings above the earth. This ensures the base of the building is isolated and absorbs the seismic waves, leaving the top intact. By reducing the impact that natural disasters have on buildings, the number of deaths and people affected is subsequently decreased as most fatalities are caused by collapsing buildings and infrastructure. Another method is to use damping and counterforce to slow the rate of vibration in the buildings. An example is the Taipei 101 skyscraper in Taiwan which uses a large steel ball suspended by cables in the middle of the building for stability during earthquakes and hurricanes. It acts as a pendulum to balance the building when it sways, as the ball moves in the opposite direction to counteract the swaying of the skyscraper. I believe this building fits in with the 10 principles as it is innovative and has led to many other buildings in high-risk zones being fitted and built with the same feature. In addition, the design of Taipei 101 blends in with the skyline of Taipei, another principle: good design should be unobtrusive; and good design should be timeless. Good design is the key to building safe, resilient buildings that are also effective; these contrast heavily with the quick builds previously mentioned, which do not correlate to them at all. These quick builds are ultimately prone to collapse, break or burn down which results in far more deaths.

In addition, another large problem is building simply for aesthetics with no other purpose. Hundreds and thousands of buildings today are significantly focused on form rather than function, shining a spotlight on the aesthetics and everything else is simply an afterthought. These aesthetic buildings

are commonly built out of concrete and steel which are not sustainable and contribute to climate change. Concrete is one of the most used materials on earth, second only to water, and results in 2.8 billion tonnes of CO2 being released into the atmosphere just in the manufacturing process, excluding transport; and is responsible for 1/10th of the industry's water usage. In addition, concrete is impermeable, increasing surface-run off and causing the land underneath to degrade and become infertile while also adding to the rising sea levels as the land cannot absorb water. These are some of the many reasons why concrete and steel buildings, while strong and stable, are simply not an option that we can continue to use if we want to achieve goal 11.6. However, there are alternatives available such as wood. Indeed, I did say wood. Wood is an option that is frequently overlooked and misconstrued, however, wooden skyscrapers made from cross-laminated timber are incredibly strong whilst also being sustainably sourced and renewable. Additionally, it introduces a unique appearance to our otherwise concrete jungle like cities, adding organic elements and the flexible nature of the material also allows more complex shapes and structures to be made. Furthermore, to showcase the exposed wood these skyscrapers and buildings have exposed wood interiors, to bring nature to these metropolitan landscapes and can "elicit a sense of warmth and joy" as said by Jonathan King, one of the architects who has adopted this unique building material. CLT (cross-laminated timber) is also more efficient than building with concrete as most of the pieces can be prefabricated and placed together at the construction site.

Another way that we can achieve goal 11.6 is by taking inspiration from existing countries and regions solutions to environmental problems they face. An example of this is settlements in Bermuda collect their freshwater. All houses on this northern Atlantic Island have white stepped roofs which are designed to collect rainwater to store in large tanks underneath their house, these steps slow down the rate of the rainfall so that as much can be collected as possible. In the age of decreasing water security, this could be the solution to implement in less affluent countries with limited resources and funds. These roofs have been around for more than 400 years, allowing Bermuda to have the flourishing nation and culture that it currently does and could potentially help millions of people with water insecurity globally. I truly believe that by upscaling this design on larger buildings or houses, there will be large positive impacts as surface run-off will be decreased, the strain on the water in large cities and regions will be decreased and improving the quality of life for millions.

To conclude, reflecting on how to solve this problem, I realised how easy it is to criticise what we have and are currently doing and not realise that at one point in time, they were the solution. And are the result of progressive thinking and the evolution of humans and our capabilities has developed throughout our history. These buildings that now we want to correct may have even been included in a similar essay by a seventeen-year-old participating in a competition. It made me see how our circumstances are constantly changing and how in an ever changing and growing world, our species must continue to adapt for survival. This statement has never been more relevant than when discussing Climate change. Climate change is a situation created by humans which can and will lead to devastation for every inch of our planet unless it can be corrected first. I would start to solve this problem through education. If we can realise the magnitude of the problem, then we can work collectively to think of the right solution. I believe the only way to achieve Global Goal Number 11 is through a mixture of sustainable and modern materials and new design solutions, this is the key to reducing our impact on the environment and reversing what we have done. I sincerely hope that our cities can influence change and that someday climate change will be known obstacle that was overcome instead of as the extinction of humanity.