The Ark Canopy

The Ark Canopy: A Floating Pavilion for Holistic Survival

In response to the growing threats of climate change and urban flooding, The Ark Canopy is a conceptual pavilion located in Benjakitti Park, Bangkok. It is designed to serve as a resilient and adaptive structure that remains functional in both normal and flood conditions. The project takes inspiration from the Earthship theory, which promotes self-sufficiency, renewable energy, and environmental harmony. At its core, The Ark Canopy explores the idea of holistic resources, which include clean water, renewable energy, sustainable food production, and appropriate technology. These four pillars guide the pavilion's systems and design approach, aligning with the brief's objective to create a structure that can protect against natural disasters.

The design is divided into two systems. The first system operates during regular weather conditions, while the second activates during flood scenarios. This dual system allows the pavilion to adapt seamlessly to changes in the environment, especially in a city like Bangkok where flooding is an increasingly common threat. By integrating flood resilience directly into the architectural design, the pavilion becomes not only a shelter but also a survival platform.

To support energy independence, the pavilion incorporates several renewable technologies. Solar panels are installed to capture sunlight, while wind turbines take advantage of urban wind flows. A biogas digester processes organic waste and transforms it into usable energy. Additionally, a piezoelectric floor generates electricity from the movement of people walking through the pavilion. Together, these systems ensure that the structure can remain fully powered regardless of external conditions.

In terms of food production, The Ark Canopy utilizes algae farming as a compact and efficient solution. Algae is nutrient-rich, grows quickly, and requires minimal space, making it an ideal food source in both normal and emergency situations. The algae are housed within the pavilion's Voronoi-structured walls. This organic, geometric pattern creates a lightweight yet strong structure, allowing light to pass through and nourish the algae while also contributing to the building's aesthetic and structural integrity.

The pavilion's floating ability comes from principles found in amphibious architecture. When flooding occurs, the foundation allows the structure to rise with

the water, maintaining balance and functionality. This system transforms the pavilion into a floating refuge, providing a safe and sustainable space during disaster events. The materials used are lightweight and buoyant, ensuring that the pavilion can adapt to changing water levels without compromising safety.

Water collection and purification are also integrated into the design. Rainwater is harvested and filtered for use within the pavilion, ensuring clean water is available even during a flood. Vegetation surrounding the structure assists with managing runoff and filtering greywater, enhancing the relationship between built and natural environments.

The Ark Canopy is not just a pavilion. It is a living example of how architecture can respond intelligently to the climate crisis. By combining Earthship theory with holistic resource systems and amphibious design, the project serves as a model for sustainable urban living in flood-prone areas.