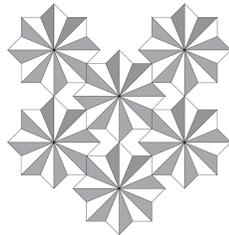


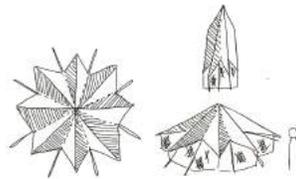


Caption

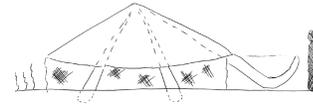
My structure is inspired by an umbrella and is designed for the North African desert region. This "roof" of the structure provides shade and protection from extreme heat. This covering would ideally be made of something reflective, flexible and breathable; for example NatureFlex from material connexion. Additionally some or all of the sections could be made of solar panels, providing energy and electricity to the refugees. The frame supporting the structure, I would suggest a lightweight wood covered with Eco Red Shield from material connexion. This wood spray would protect the frame from wood damage and other harsh conditions. The mesh hanging from the edge of the roof as seen in figure 2 and 3 would be made of west african weaved cotton to provide further sun protection and breathability. Additionally containers can be placed under the ridges in the roof to collect water. These ridges also fold in to collapse the structure so it can be moved at a moment's notice.



Structure in a grouping



Left to Right: Aerial view, folded view, side view.



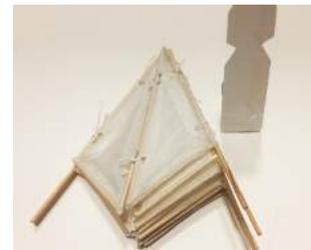
Original drawing of structure.



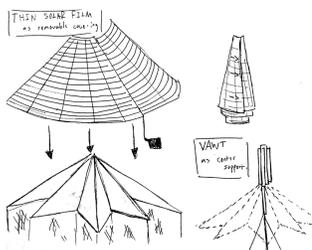
Side view of prototype



Aerial view of prototype



Folded view of prototype



Structure outfitted with energy solutions

My structure will have a thin solar film covering that can be detached and rolled up for mobility. The film could charge small survival devices such as a flashlight. The second figure shows the main support for the structure converted in to a small vertical axis wind turbine that could power small devices as well, using the energy of wind from large dust storms that are common in the North African desert.



Eco Red Shield Wood is a coated wood that is water proof, rot- proof, termite proof and fireproof.



Milkweed fabric is extremely lightweight and durable. It also provides thermic insulation.



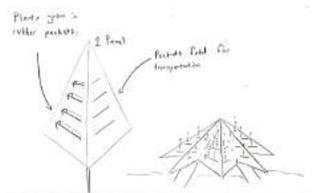
Nature Flex is a heat-sealable, highly- reflective compostable film made of cellulose polymer. It exhibits excellent heat-stability.



Daiken Sukoyaka is a woven mat made from highly durable resin-coated paper yarn, which is highly abrasion resistant and water repellent.



Agric Cell BW is a bio-based insulation material made from natural grass cellulose (96%) and a boric acid fire retardant.

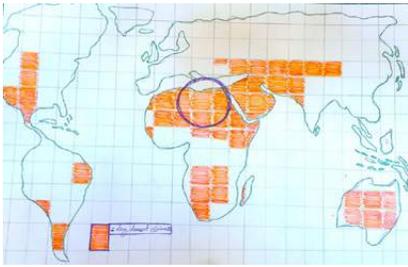


Structure outfitted with growing solutions

My structure is equipped with a vertical growing system. Each panel will have 4-5 "envelopes" that fold out to create pockets for soil. The pockets will be placed so that rainwater can be easily diverted into each. They will be made from a resilient, rubbery, waterproof material so that they can be cleaned easily and reused many times. Although it may not be completely practical, the growing space would utilize a hydroponic system in order to avoid using traditional soil which is not abundant in North Africa.

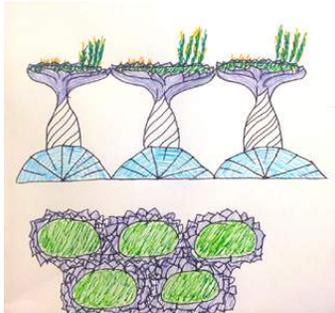
Extreme Heat/Drought Structure

Liam Griffin

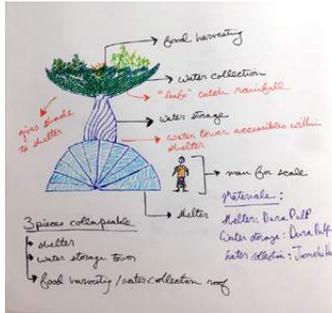


World Map of Desert areas

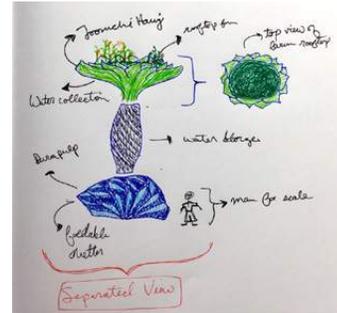
My structures were created with the use from the person living within it. The user would need the structure in times of harsh weather and drought. The main focal point of the structure is water collections and storage to ensure the optimal amount of water is collected in times of drought. Due to the collapsible nature of both the shelter, the water storage tank, and the top area used for farming food, the overall structure is transportable. Due to the overall rectangular shape it takes up in regards to flat land, the structures can be connected to create a village of individual yet interconnected shelters and a large, spanning food garden on top. This allows for optimal shade to the shelters below, water collection to the layer above, and the most efficient way to grow food with ample sunlight and structural integrity.



Connected Structures



Structure Drawing: 1



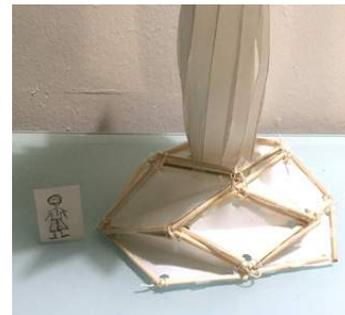
Structure Drawing: 2



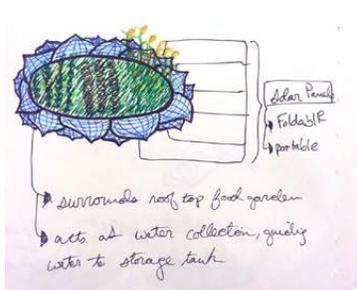
Structure Photo: 1



Structure Photo: 2

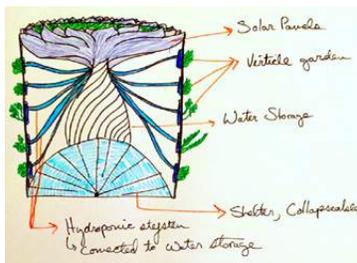


Structure Photo: 3



Structure Energy Production

The solar panels surround the food garden at the top layer of the shelter. Due to the shape of the solar panels and the fact that they are flat, they can be easily collected together and stacked for easy transportation. Additionally, since the solar panels are on the top layer of the shelter and is made for a dry, desert like climate, the solar panels will be able to receive copious amounts of undisturbed sunlight, allowing for optimal energy generation.



Structure Food Production

With the addition of vertical food garden walls, the overall structure reaps many benefits. The vertical food garden walls supply more sustainable produce. The walls themselves create additional insulation from the outside climate, creating an inside temperature regulated environment. The plant structure works on a hydroponic system, drawing in water from the water tower, removing the need for soil and allows for the preservation of as much water as possible, since the structure is presumed to be used in a dry climate.



Bioleather: flexible, tough sheet made of bacterial cellulose. High water resistance, high tear resistance.



Joomchi Hanji: Korean mulberry paper with a leather-like texture. Flexible stiffness works well as an insulator.



DuraPulp: Similarly to plastic. Strong, rigid, biopolymer. With high water resistance, it work well as a waterproof material.



Silver Ice® X: reflective stainless steel coating. High thermal conductivity, water resistance. Approved for outdoor use.



POLYSOLE®XD: biodegradable thermoplastic. gives flexibility, increased strength and increased impact capacity.



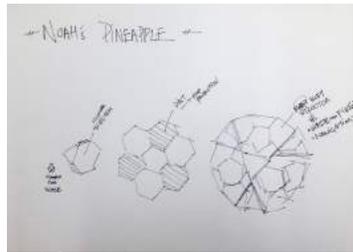
> World map showing locations with extreme climate change -sea level rise and over abundance of water

DESIGNED FOR EXTREME WET WEATHER

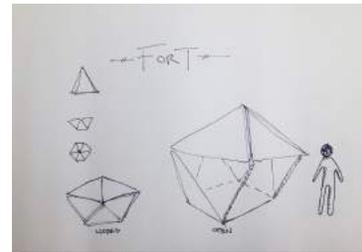
This map shows locations on Earth where wet weather has increased - natural disasters caused by global warming and our impact as humans on our environment. Many places such as the Marshall Islands in the Pacific Ocean. - My first structure was designed with rising sea levels in mind - I call it ,Noah's Pineapple' - It is a demi spear made up of hexagons and pentagons. It shouldn't matter whether the structure is on land or in water, people can live in it. The structure is completely off the grid and can be connected to other ,pineapples' and exist as a part of a larger ,barge' community.



Noah's Pineapple - primary sketch



Noah's Pineapple - secondary sketch



Fort - primary sketch



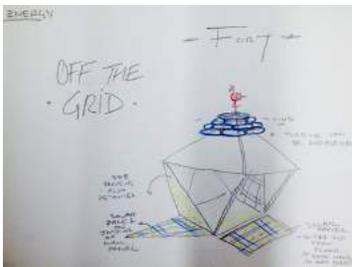
First Pineapple model



Third Pineapple model - floating development



Fort - final model



Fort - sustainable energy sketch

S U N

The floor and two side wall panels are solar panels . Panels can fold out or slide out when weather permits it.

W I N D

Since the sun is not always out, a wind turbine can be attached to the roof of the structure, when closed or open. The turbine would ideally disassemble into a small chair.

S P R O U T S

The structure has two supporting columns that keep it open (in good weather). These columns can be assembled and disassembled with ,buckets' that become a hydroponic sprouting system. The buckets can still be used as sprouters while structure is closed.

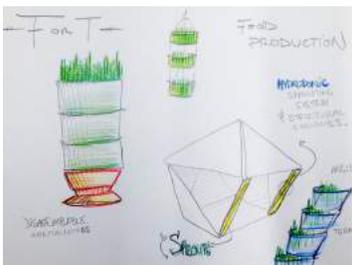
W O O D
salvage, drift, or lumber preferably a hard wood like

F A B R I C
recycled clothing or waste from factories

PLANT -BASED POLYURETHANE RIGID FOAM
surfboard material

A D O B E
earth and straw - old tires, glass bottles, and other locally found materials

R E C Y C L E D PLASTIC BOTTLE FABRIC
waterproof - ,tarp like' weight



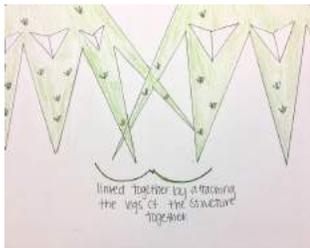
Fort - sustainable food sketch

GLOBAL AVERAGE ANNUAL PRECIPITATION

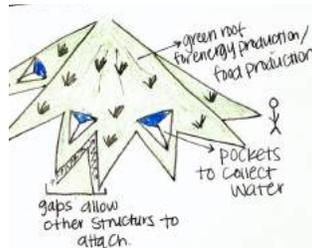


WORLD MAP (key location : New Orleans) (climate: extreme flooding and rain)

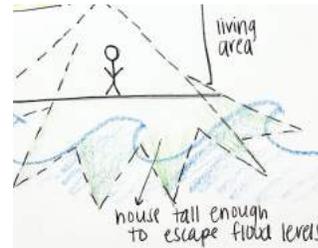
My structure is a modern take on the tradition house made above stilts. My "stilts" are able to drill into the ground and the triangle shape makes it more durable to currents. The living area is well above the maximum flood line so the person living in this will not have to worry. There are open-mouthed structures on the side of each panel to collect and store rainwater. Each panel also is a green roof where food can be grown. The green roof will also reduce the daily energy demand. A structure identical to this one is able to latch on using the legs of the shelter and they will lock and are able to float away connected if need be. This structure is designed to be built in New Orleans, Louisiana.



STRUCTURAL SYSTEM DRAWING



OUTSIDE VIEW



INSIDE VIEW



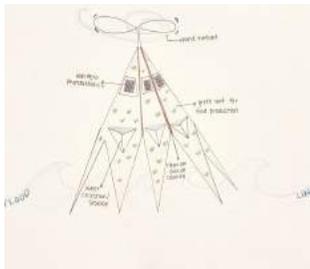
STRUCTURE VIEW



BIRDS EYE VIEW

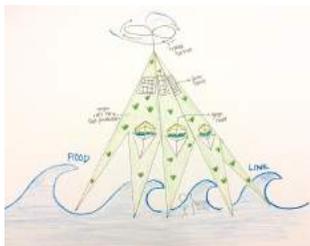


CLOSE UP



ENERGY SYSTEM OF STRUCTURE DRAWING

My structure is a modern house on stilts that dig into the ground to prevent flood currents carrying it away. There are panels on the sides of the structure to collect and store water and, with more research, possibly used to grow food. I also added Mathero Photovoltaics that are environmentally friendly, organic photovoltaics that are efficient and cost effective solar panels. A wind turbine is also added to the top of the structure, which also acts as shade. The green roof keeps energy use low with insulation and provides space for growing food. I also added a titanium dioxide coating, which acts as a catalyst for smog and turns the chemicals into water or calcium nitrate.



FOOD SYSTEM OF STRUCTURE DRAWING

On my structure there are small-scale greenhouses on panels and it is a glass structure, which allows sunlight to reach the plants and it is a hydroponic system. The hydroponic system allows the plants to reuse rainwater. The green roof brings down energy use by insulating the house. The windmill circulates the water and produces energy for the greenhouse so with that and the solar panels it is 100% renewable. I chose to use hydroponics because I am in an area where flood and rain is extreme and it is a good use of the excess water.



EtaProof is a natural fabric that is hardwearing, weatherproof and breathable.



ClimSel™ is in the natural phase change material that absorbs and discharges energy overtime.



Bioleather is a skin like material that is tough, flexible, and translucent. Good for food production.



MycoBoard™ is an alternative to engineered wood, made from agriculture



Corkshell™ is a thermal insulating fabric that incorporates natural cork granulates.

SUN TO THE STORM SHELTER

SARA DISRAELI



