ACACIA VILLAGES

FLOW SS23

ANDREI KAZLOUSKI
RAMINA KHAKIMOVA

INTRODUCTION

The project's main goal is to bring the benefits of the green revolution to the populations most vulnerable to desertification. By providing housing, education, and fertilizer to local people, we can help them stay in their region and take care of their land. The communal housing will encourage the growth of green spaces around the chosen site.

When farmers are successful in cultivating their crops, they can uplift themselves out of poverty. When farmers thrive, they can eliminate poverty and hunger from their communities.

Acacia Villages is a mobile center that is emerging in the arid Sahel region. It offers education, training in agricultural technology, affordable fertilizer, and modern tools. It also creates a local trading zone to maximize profits from crop sales. Agriculture around the center flourishes, and knowledge spreads far and wide. The structure expands as more participants join in.

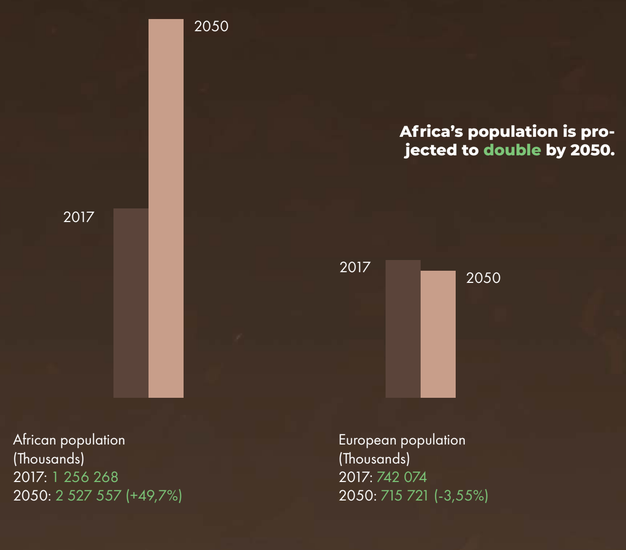
ISSUE





POPULATION

- Africa's population to double in 40 years, youth population to grow from 205M to 330-450M
- Growth could lead to higher productivity or social tensions, violence, and conflict
- UN's low-fertility variant shows working-age population to increase by 630M, leading to a 25% increase in per capita incomes
- Job creation uncertain, requires 12-15M new jobs annually to absorb the increase in working-age population.

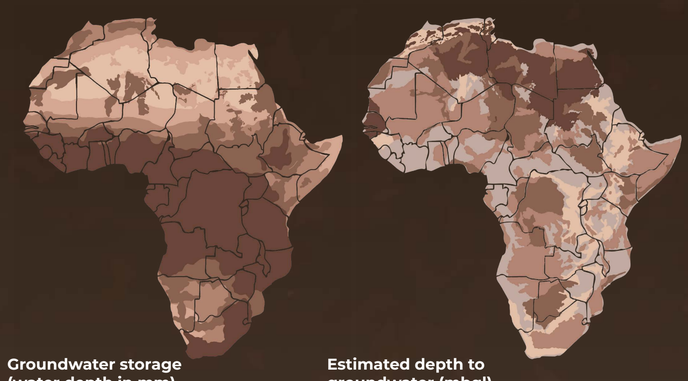


CLIMATE

- Africa is already one of the hottest regions on Earth.
- By the end of the century, Africa's median temperature could increase by 3-4°C, which is 1.5 times higher than the global average.
- The temperature increase will impact rainfall, causing extreme wet seasons in West and East Africa and drying in Southern Africa and the Sahara.

WATER PROBLEMS

- Africa has limited water resources.
- Some African countries are projected to exceed their water limits by 2025.
- Climate change may cause increased water stress for 350-600 million people.

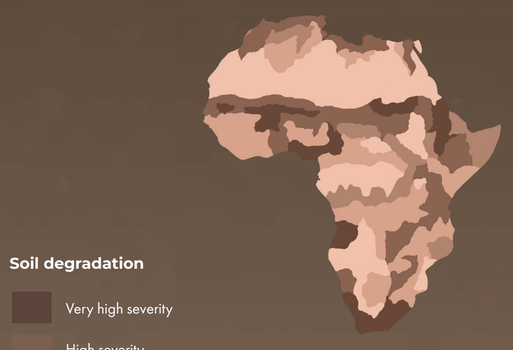


INFRASTRUCTURE

- Weak physical infrastructure is hindering Africa's integration into the global trading system.
- Higher trade costs are incurred, especially for landlocked countries.
- Most roads are unpaved, and those built in the 1970s and 80s are in poor condition due to a lack of maintenance.
- Africa's rail transport system is poorly interconnected and has about 83,987 km of railway lines over an area of about 30.3 million square km.

FERTIL SOIL DEGRADATION AND DESERTIFICATION

- Around 45% of Africa's land is impacted by desertification, with 55% at high or very high risk of further degradation.
- The Sahel region is especially affected, with around 135 million people living in poverty and depending on degraded lands.
- Land degradation and desertification also harm biodiversity and ecosystem services, causing economic losses and hindering development.



WIND MAP

- Increasing desertification in this region which is essentially pulling the Sahara desert south.
- Over the last 100 years the Sahara desert has grown has grown by 10% and will continue to expand. It will affect a ton of people without any produstive land to grow food.

CAUSE OF SOIL DEGRADATION AND REGENERATION SOLUTION

Soil Erosion:
- deforestation
- improper land management practices
- intense rainfall

Land Use and Agricultural Practices:
- excessive tilling
- overgrazing
- monocropping
- inadequate crop rotation.

Climate:
- extreme temperatures
- long dry seasons
- heavy rainfall

Soil degradation

Water Management:
- inadequate irrigation
- drainage systems

Nutrient Depletion:
- intensive cropping
- lack of organic matter input
- limited use of fertilizers exacerbate nutrient depletion

Organic Matter Content:
- limited availability and use of organic matter contribute to soil fertility challenges.

→

Access to Resources:
- improved seeds
- fertilizers
- organic inputs
- farm equipment

Climate-Smart Agriculture:
- water conservation
- agroecology
- the use of climate-resilient crop varieties.

Soil regeneration

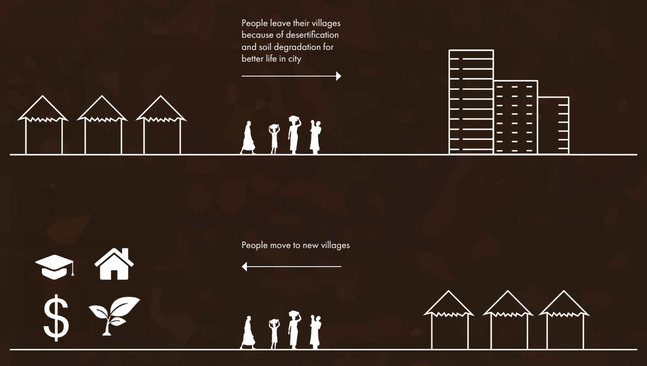
Farmer Training and Education:
- sustainable agricultural practices
- soil conservation techniques
- proper nutrient management

- Plant trees that can survive in extreme conditions and that accumulate water

SOLUTION

THE GOAL

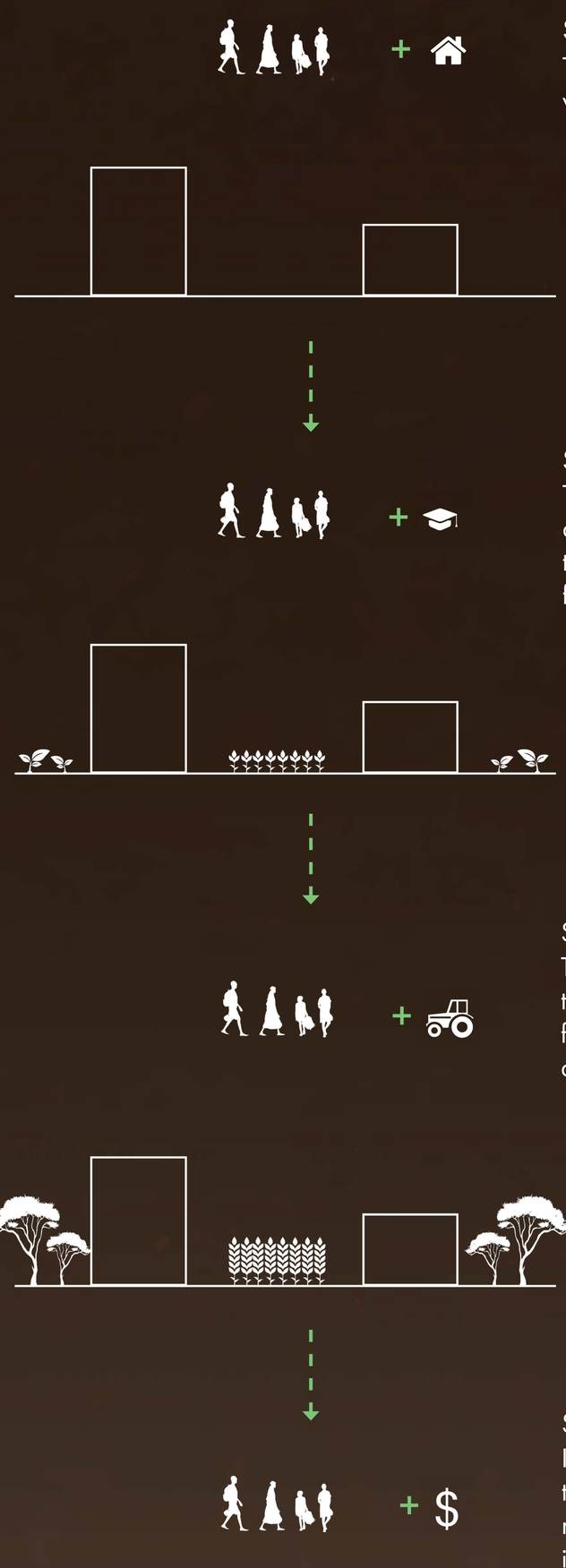
The goal of the project is to stop mass migration to large cities, which are already considered overcrowded. Create all suitable conditions to attract local care and restore fertile land. Improve the economic side in the Sahel region, through the formation of new villages along the border with the Sahara.



THE GREAT GREEN WALL

Problems: land degradation, desertification, increased temperatures, and prolonged droughts leading to food insecurity, water scarcity, and migration of people.
Goal: to restore 100 millions hectar of degraded land, to preserve water resources and increase vegetation, to provide water and food security.

VILLAGE AUTONOMY



Step 1
The process of settling villages.

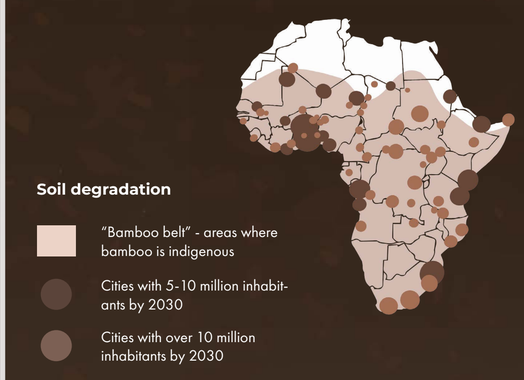
Step 2
Training local residents in proper traditional and alternative farming.

Step 3
Training in agricultural techniques, affordable fertilizers, and modern tools.

Step 4
It also forms a local trading zone to maximize profits from selling harvested crops.

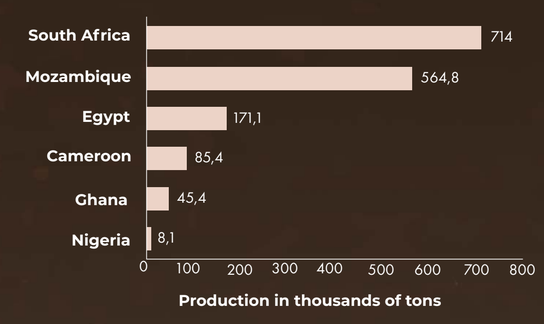
MATERIALS: BAMBOO

- With about 1 million hectares of indigenous bamboo, Ethiopia is the biggest bamboo grower in Africa. It is home to 67% of all African bamboo.
- The compressive strength of bamboo is two times higher than concrete, while the tensile strength is close to steel.



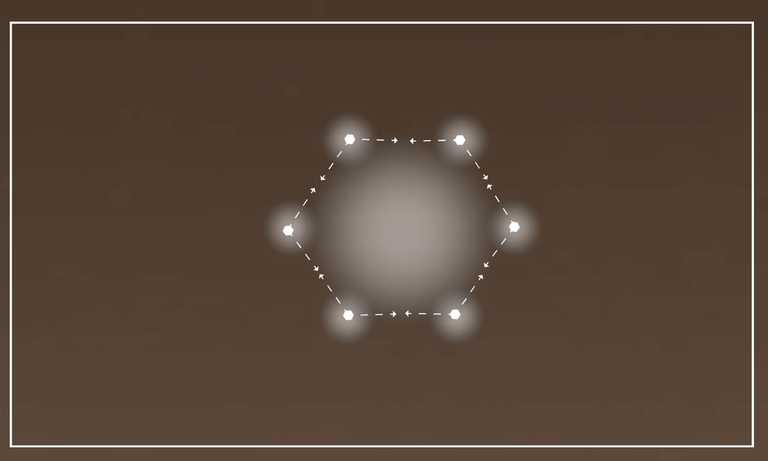
MATERIALS: ALUMINIUM JOINTS

- Aluminum is a lightweight material that is also resistant to heat and corrosion. It has a high thermal conductivity, which allows it to dissipate heat quickly, making it a good choice for use in hot weather.

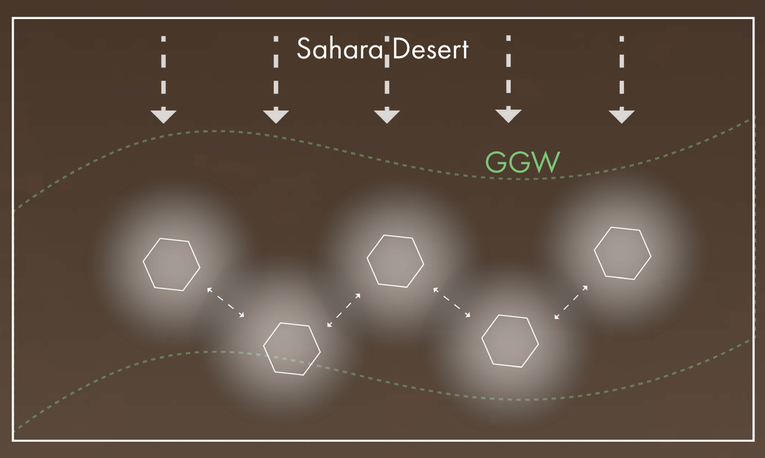


THE AGREGATION CONCEPT DIAGRAMS

Nodes in the desert

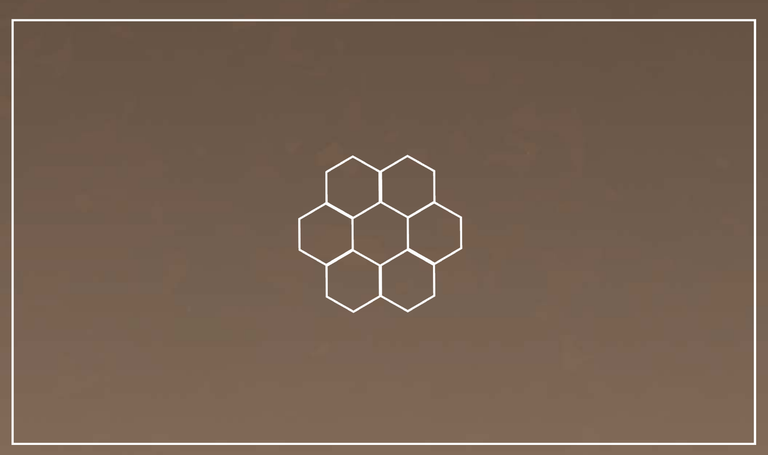


The nodes gradually increase in size, forming a village

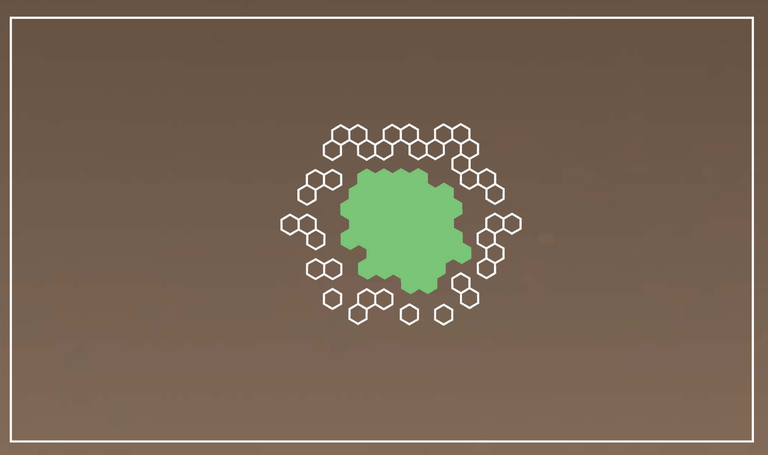


Over time, neighboring colonies progressively multiply, forming a protective belt against the spread of the Sahara Desert.

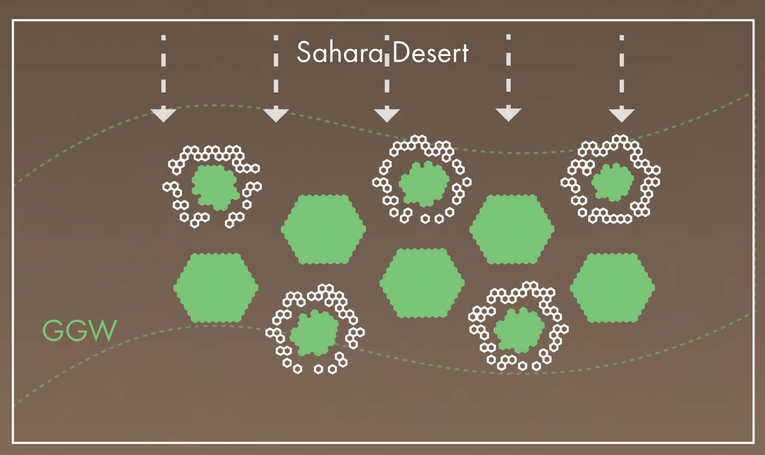
INTERNAL AND EXTERNAL ECONOMY CONCEPT DIAGRAM



The green space provided by GW can be used as a seed for building growth and provide a basic living environment.



The inner courtyard forms a space for farming, which is protected from wind and desert.



Agriculture within the village thrives and knowledge spreads across the horizon. The structure grows with more participants, and when the local community becomes self-sufficient, it moves to other places.

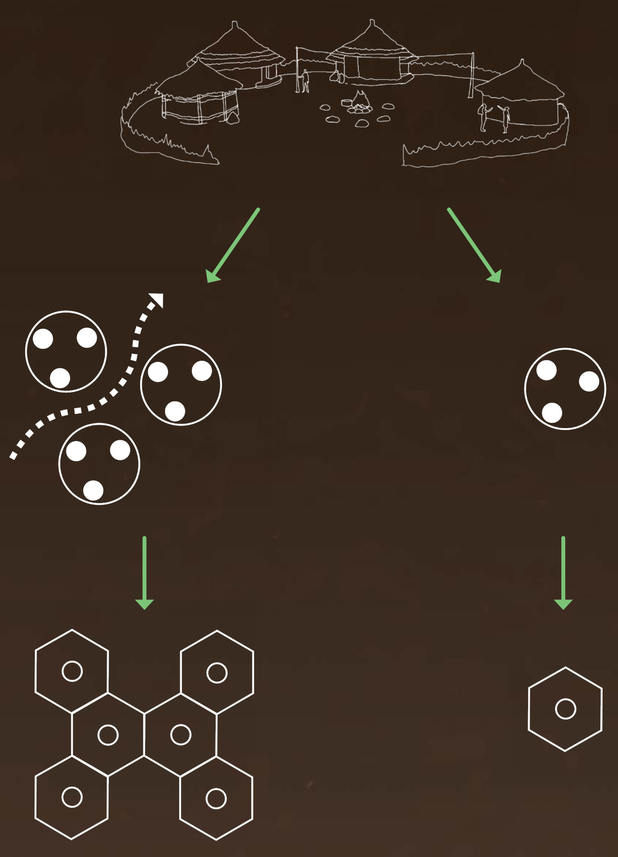
CONCEPT

CONCEPT EXPLANATION

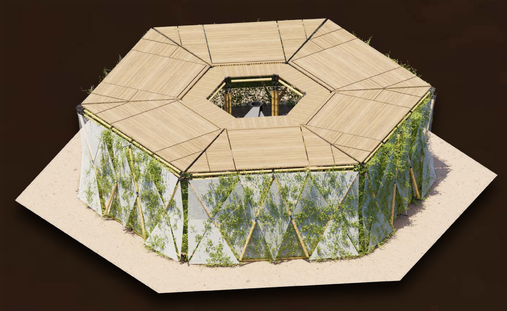
Inspired by one of Africa's symbolic treasures, the acacia tree, our project seamlessly mirrors its innate functionality and captivating modus operandi. Thriving in clusters, these majestic giants intertwine their branches to form a sprawling canopy, a refuge that embraces diverse creatures and verdant flora alike. Beneath this benevolent shade, water is conserved, breathes life into parched lands, and fosters a vibrant ecosystem, embodying the resilience and interconnectedness celebrated in African cultures. The acacia tree stands as an enduring symbol of unity and togetherness, a testament to the profound strength found in collective harmony

SHAPE CONCEPT

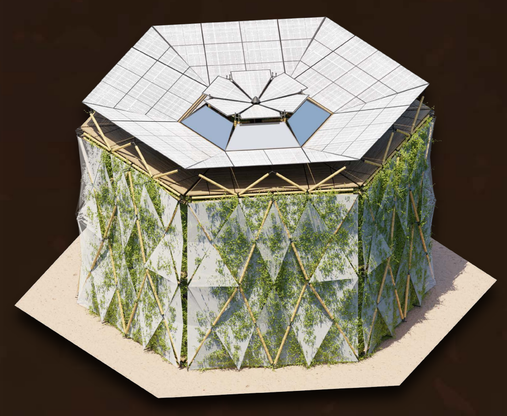
African villages are characterized by circular huts, arranged in a radial order rather than haphazardly. These huts serve as gathering places, with each plot accommodating a family of around 20 people. These families form clans, and a typical village can comprise up to 100 individuals, constituting the village's population. The concept is rooted in their traditional housing practices, where one unit represents a family, and the entire structure represents a clan.



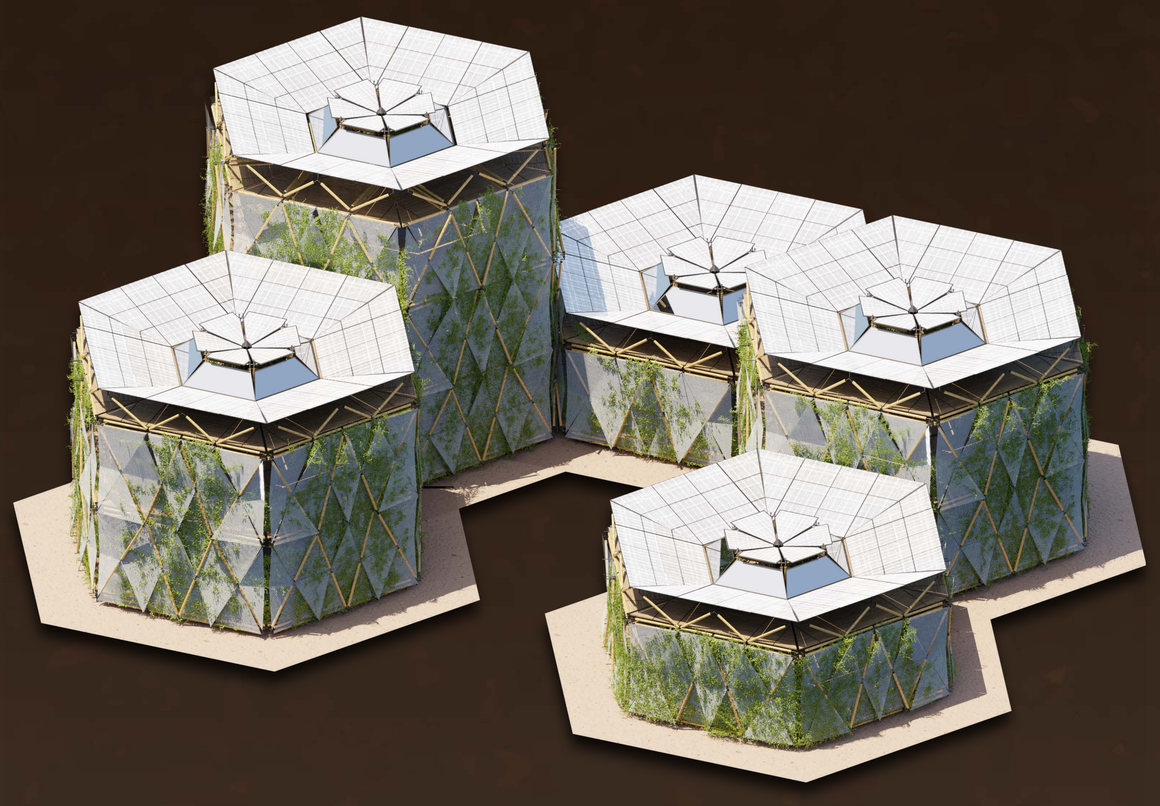
CONCEPT DIAGRAMS



The module can easily be adapted to different functions.



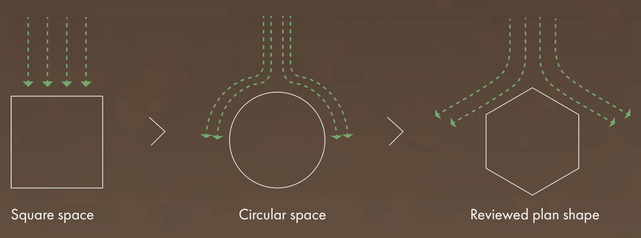
Depending on the density, models can be built in height



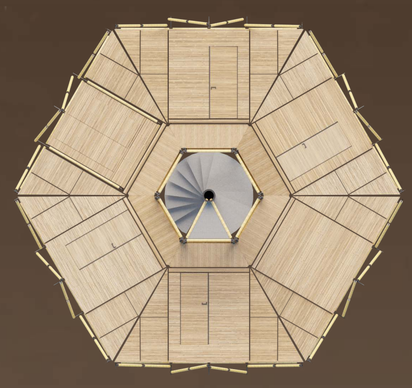
Several buildings create a community. This structure creates a sturdy structure to protect against the wind and create a microclimate inside.

WIND DIAGRAMS OF MODULE

Africans construct round, streamlined dwellings to withstand strong winds and prevent them from being blown away. The hexagonal shape emerged as a modular adaptation, facilitating construction and transportation to various sites.



PLAN OF STANDARD MODULE



PLAN OF LIVING MODULE

Max. capacity of people 12 people, depends on the size of the family. Separation of space and beds are built into the floor.

EXAMPLE INFRUSTRUCTURE FOR FOR A POLULATION OF

The village will be equipped with basic infrastructure such as first aid, a marketplace, schools for basic science and agriculture, vertical farms, livestock facilities, and public spaces.