IMPECUNIOUS COMMUNITIES LIVING BY THE EDGE

Vibrant communities lie at the heart of dynamic cities all around the world.

Their history, stories, dreams and aspirations have triggered the urban transformation for a future that is more sustainable – economically, environmentally, culturally and socially.

Makoko is a neighbourhood, or localised community, located on the coast of mainland Lagos. A third of the community is built on stilts along the lagoon and the rest is on the land. Their main occupation is fishing. The rising water level have led to the wear and tear of several stilts on the Iwaya/Makoko waterfront and many families were rendered homeless.

Similarly, Mumbai's urban villages are historically endowed with this rich social and cultural capital yet have a disturbed composure of existence. Struggling to fit into the mosaic of the city's contemporary urban culture is one such community in Worli, Koliwada - the fishermans village.The community is in a deep turmoil due to the scarcity of land resource due to increasing water levels and lack of sanitation, and is on the verge of being declared as slum.

There are a lot of such small communities all around the world (Africa, Bangladesh, India, Vietnam, Philippines etc.) who are living in most undesirable conditions and who cannot afford safe accommodation. These communities would find it difficult to afford and adapt to the modern technologically advanced floating cities and there is a need to formulate strategies for such communities to create a safe and sustainable environment.

Figure 1 : Makoko Slum, Lagos, Nigeria
Source : http://www.nleworks.com/case/lagos-water-communities-project/

Project's Name — Habita(T)ide

Description — Community Background

JACQUES ROUGERIE FOUNDATION SPACE AND SEA GENERATION INSTITUT DE FRANCE

CONCERNS

So considering the factors of economy, equity and social vulnerability of the people living along the coastal area in developing and underdeveloped countries number of questions arise.

Are the proposed future approaches to technologically advanced floating city modules being developed, the most appropriate and a universal solution for the future of architecture on water?

Considering the economic constraints for developing and under-developed nations, can these solutions be widely adopted and suitable for all regions?

Does the use of local material benefit? Can frugality be explored as a means of construction?

What is the most sustainable and economical design strategies that can be adopted to design?

Even with the encroachment on water, can a symbiotic relationship be developed that benefits man as well as the aquatic life?

"Great Architecture has only two natural enemies : water and stupid men"

-Richard Nickel

"Each new situation requires a new Architecture."

-Jean Nouvel

Figure 2 : Makoko Slum, Lagos, Nigeria
Source : http://www.nleworks.com/case/lagos-water-communities-project/

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline

Project's Name   Habita(T)ide

Description   Concern and Responses

JACQUES ROUGERIE
FOUNDATION
SPACE AND SEA GENERATION
INSTITUT DE FRANCE

DESIGN CHALLENGES

RISING WATER LEVEL

The change in water levels during day and night due to tide, and global warming.

ADAPTABLE STRUCTURE

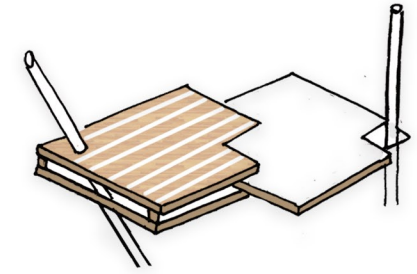The structure needs to be transformable subject to change in water levels

CONSTRUCTION COST

The cost of construction should be low and maintenance to be economical.
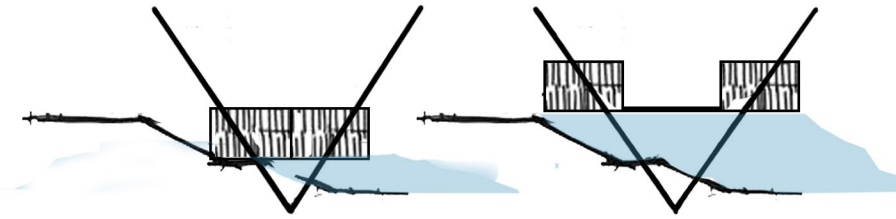
THE ANCHOR
Deep Foundation to provide rigidity to the structure

Even incase of floods all the spaces are connected due to the expandable deck

DESIGN IDEA

Simple — Energy

WATER -The Driving Force

Achieving the movement without any source of external energy.

MODULAR

Easy to use as prototype and create various clusters with same module.

SELF BUILDABLE

Simple joinery, sustainable material ,easy and fast construction methods.

RISE IN WATER LEVEL DUE TO FLOOD

DROP IN WATER LEVEL DUE TO LOW TIDE
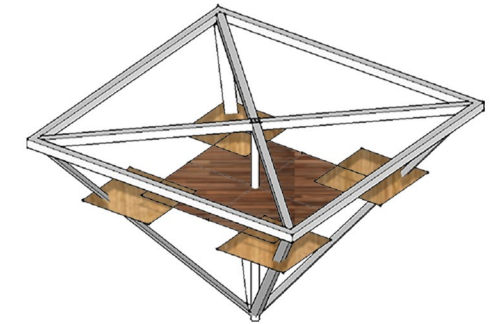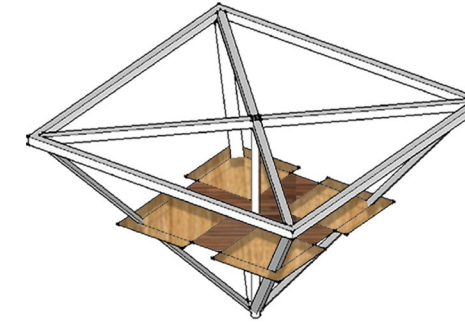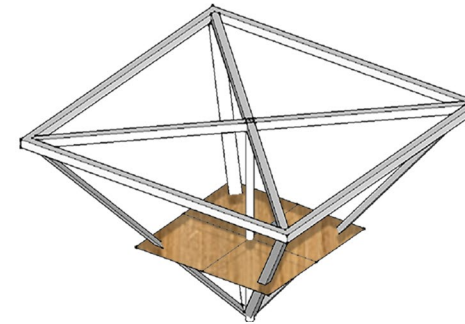
DAILY ACTIVITIES - LIFESTYLE

1 BOAT SET FOR FISHING

2 DETANGLING FISHNET

3 SORTING THE CATCH

4 CLEANING AND DRYING

5 SELLING FISH
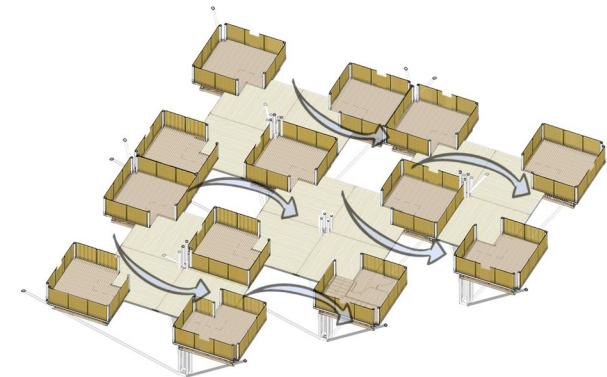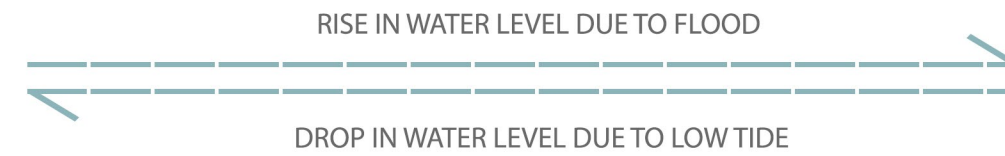
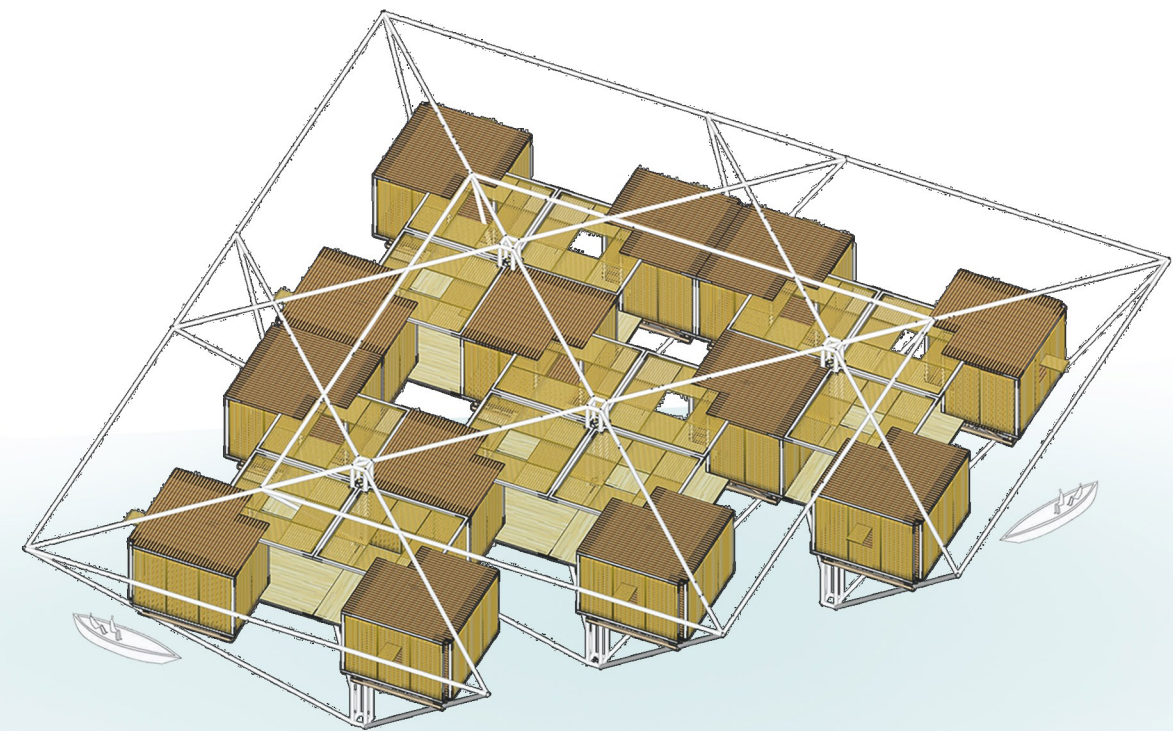Avoiding long walls to mitigate the effect of wind pressure
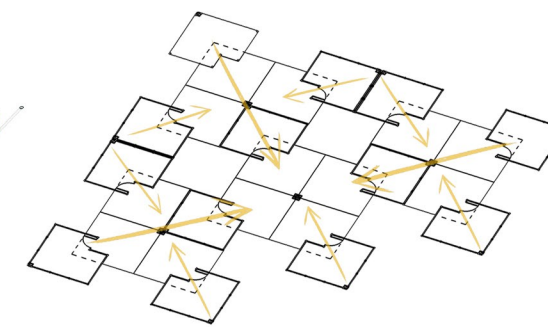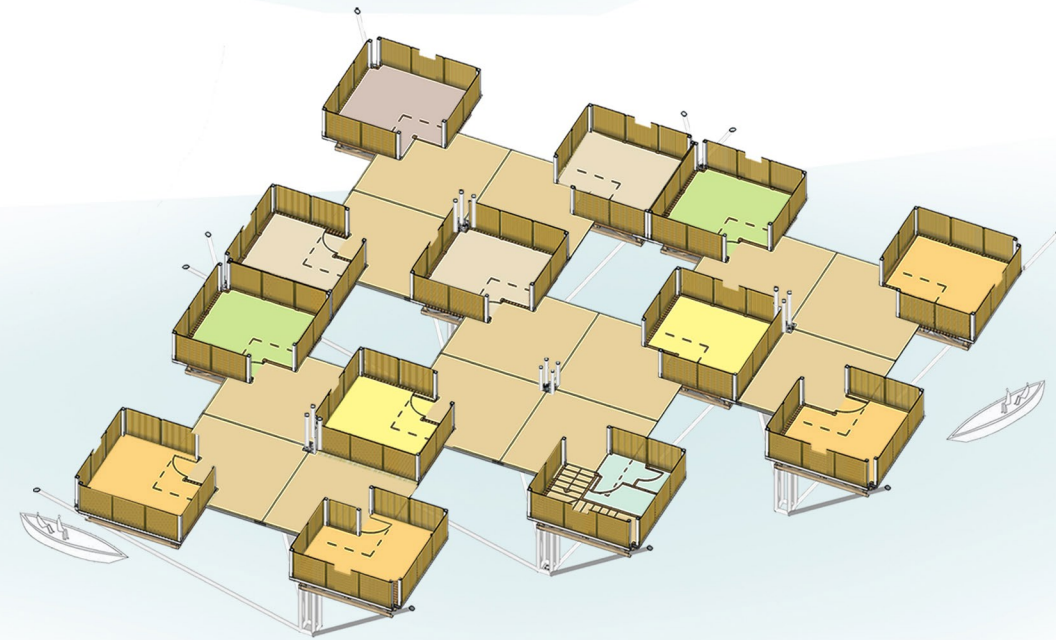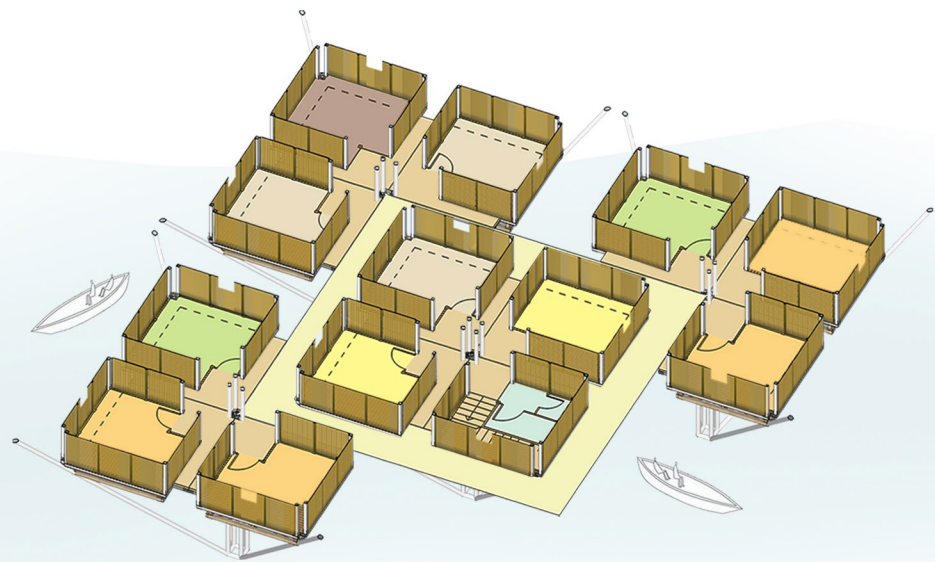
The form avoids wind from creating a tunnel effect.
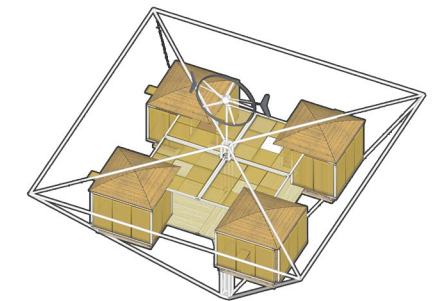
All semicovered spaces have openings to reduce upthrust of wind
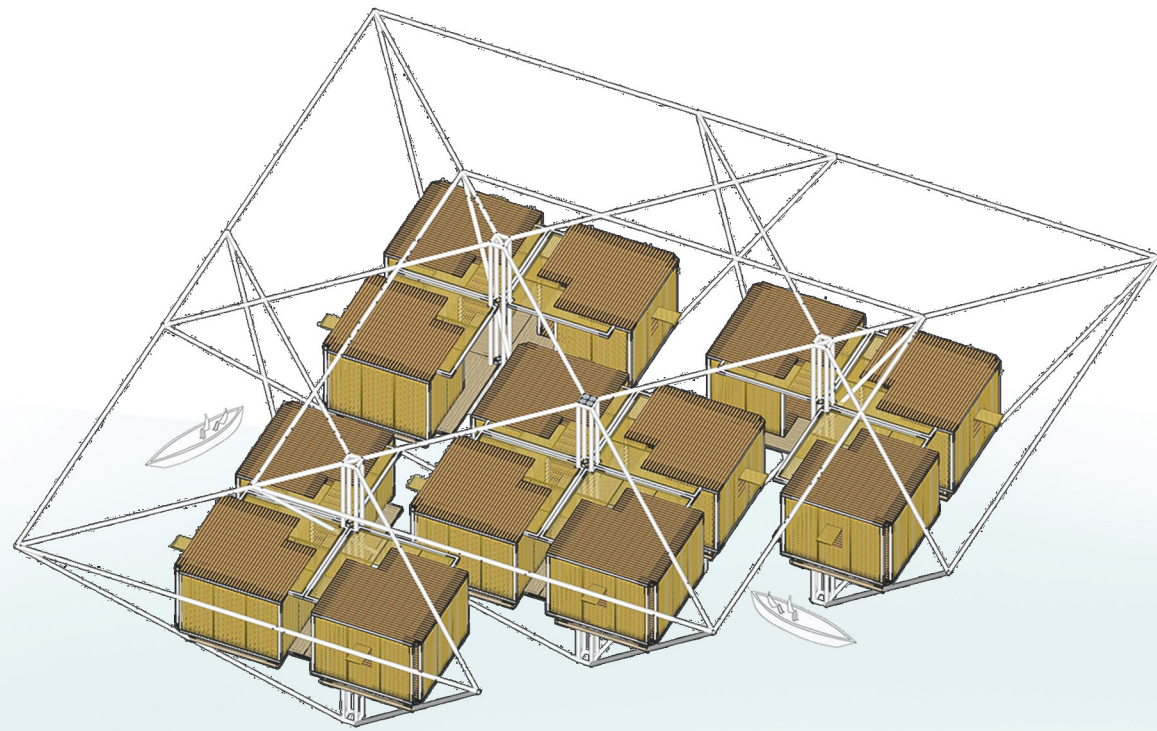
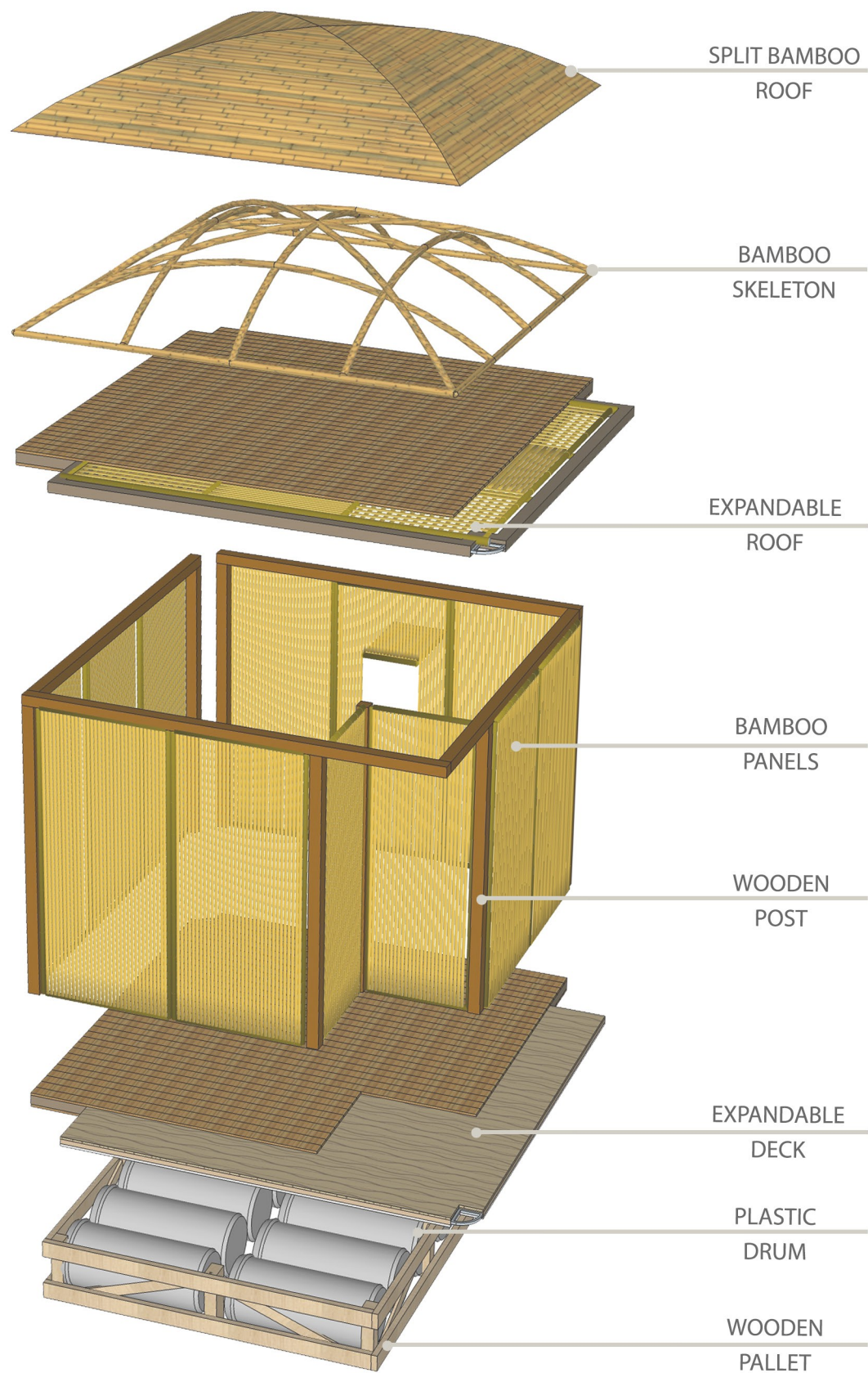STAGE1: WHEN THERE IS LOW TIDE
(When the water level is low)

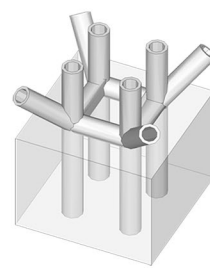STAGE 2: WHEN THERE IS HIGH TIDE
(When the water level rises)

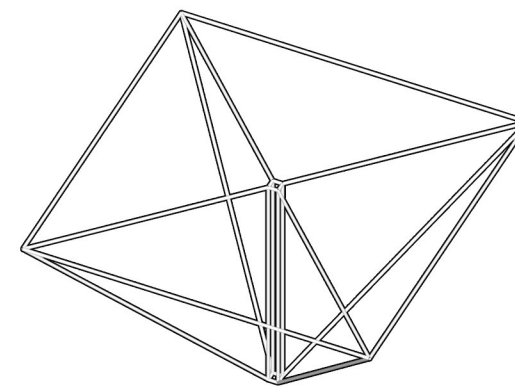TWO FAMILY CLUSTER MODULE
(8-10 PEOPLE EACH)

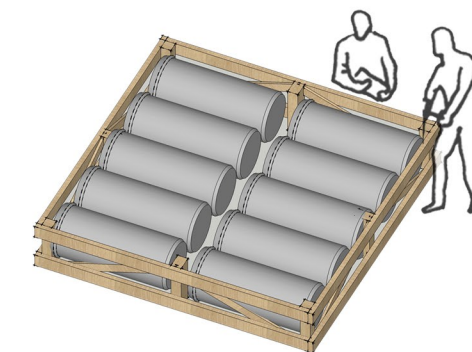|				
☐ BEDROOM (2 PER FAMILY)	☐ LIVING ROOM (1 PER FAMILY)	☐ JETTY (COMMON AREA)	☐ PASSAGE (IMMOBILE DECK)
☐ KITCHEN (1 PER FAMILY)	☐ STORE/DRYING ROOM	☐ BATHROOM (COMMON)	☐ DECK (EACH MODULE)

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline

Project's Name   Habita(T)ide

Description   Introduction

JACQUES ROUGERIE
FOUNDATION
SPACE AND SEA GENERATION
INSTITUT DE FRANCE

SPLIT BAMBOO
ROOF

BAMBOO
SKELETON

EXPANDABLE
ROOF

BAMBOO
PANELS

WOODEN
POST

EXPANDABLE
DECK

PLASTIC
DRUM

WOODEN
PALLET

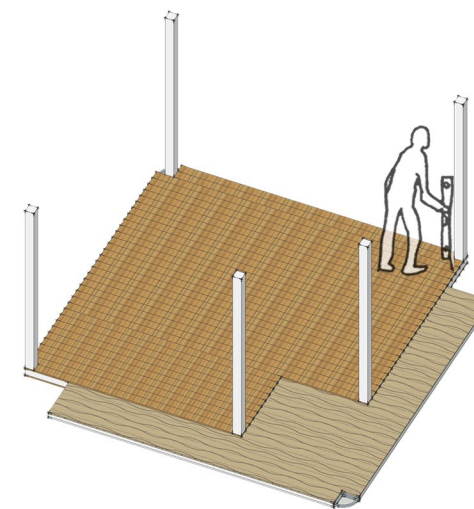EXPLODED VIEW OF SINGLE MODULE

1 MAKING THE FOUNDATION
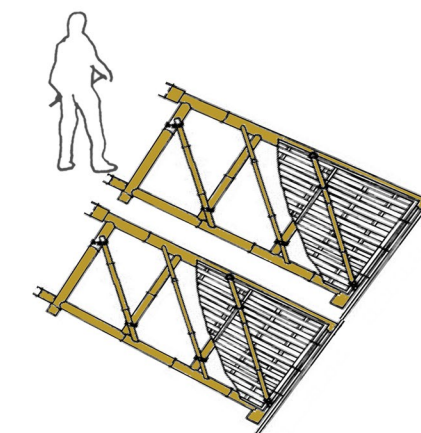
2 ERECTING THE STEEL FRAME
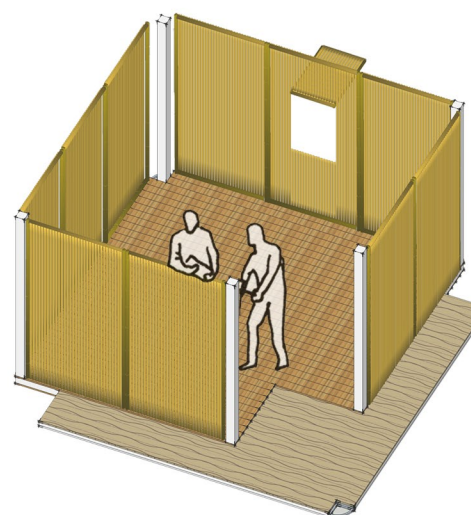
3 MAKING WOODEN PALLET FOR PLASTIC DRUMS
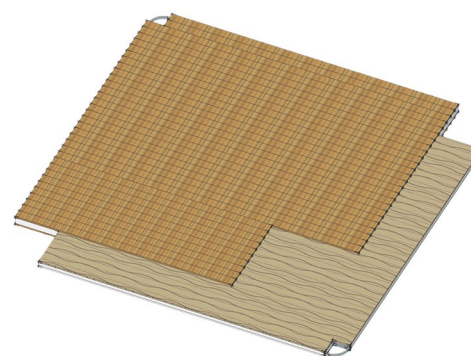
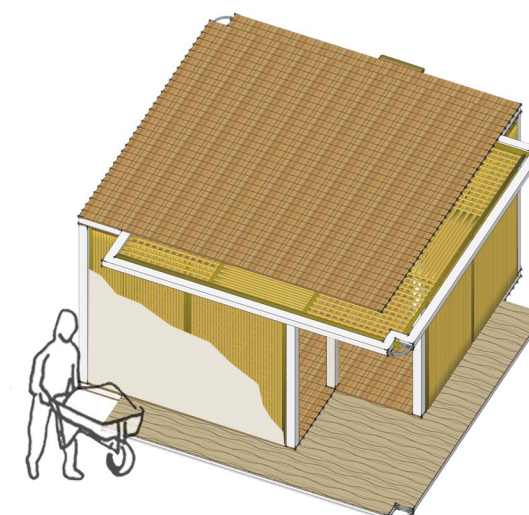4 MAKING FLOOR AND EXPANDABLE DECK

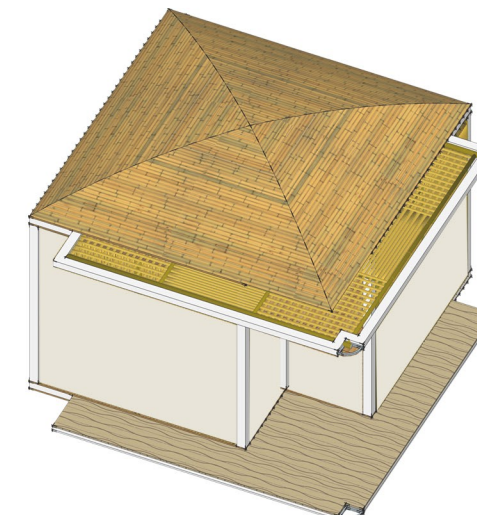5 ERECTION OF WOODEN POSTS AS COLUMNS
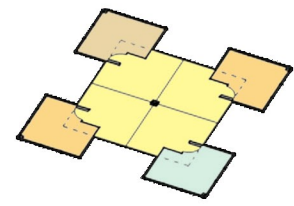
6 MAKING BAMBOO PANELS

7 ERECTING BAMBOO PANEL
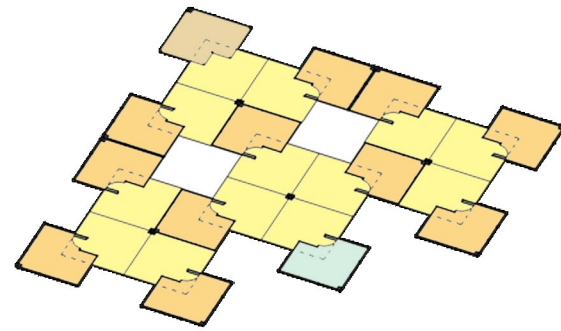
8 PLASTERING THE PANELS (OPTIONAL)

9 CONSTRUCTING SLOPING ROOF (OPTIONAL)

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline

Project's Name   Habita(T)ide

Description   Construction Process

JACQUES ROUGERIE
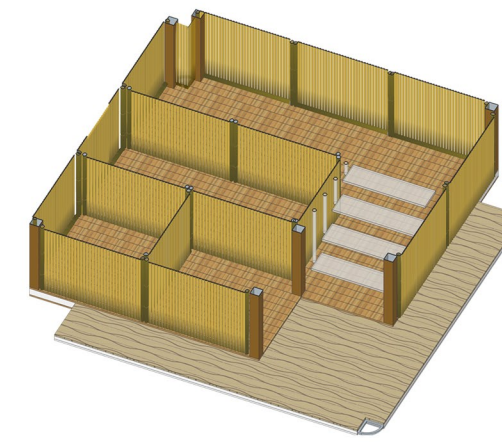FOUNDATION
SPACE AND SEA GENERATION
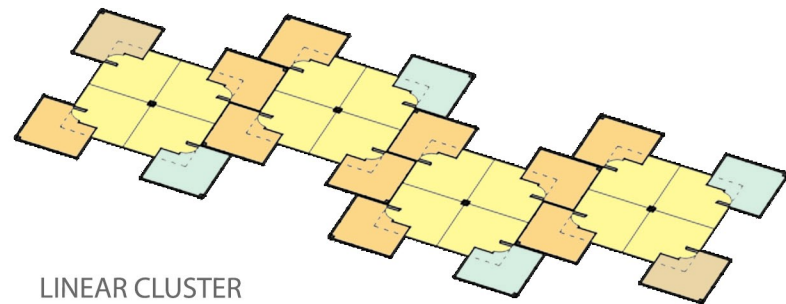INSTITUT DE FRANCE

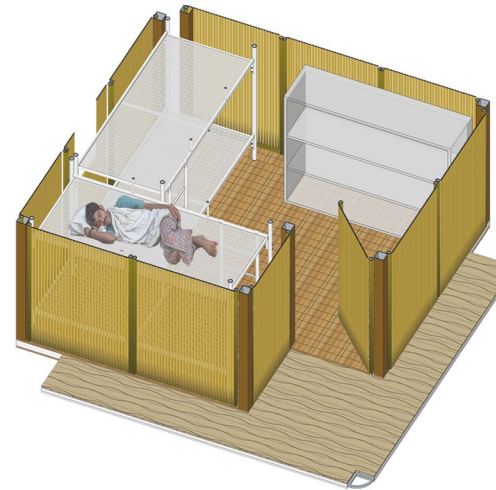FAMILY SINGLE HOUSE

TWO FAMILY HOUSE
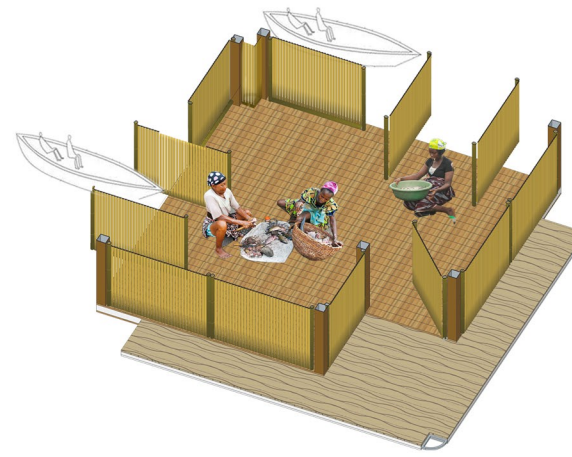
JETTY AREA

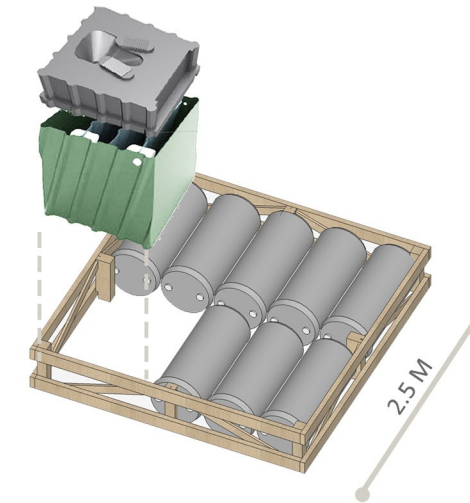LIVING ROOM
Family space to eat, rest
during the afternoon

LINEAR CLUSTER

2.75 M

2.5 M

COMMUNITY CLUSTER

3.00 M

3.00 M

To/Terrace

Bathroom

1 M 1 M 1 M

1 M 1 M

3.00 M

3.00 M
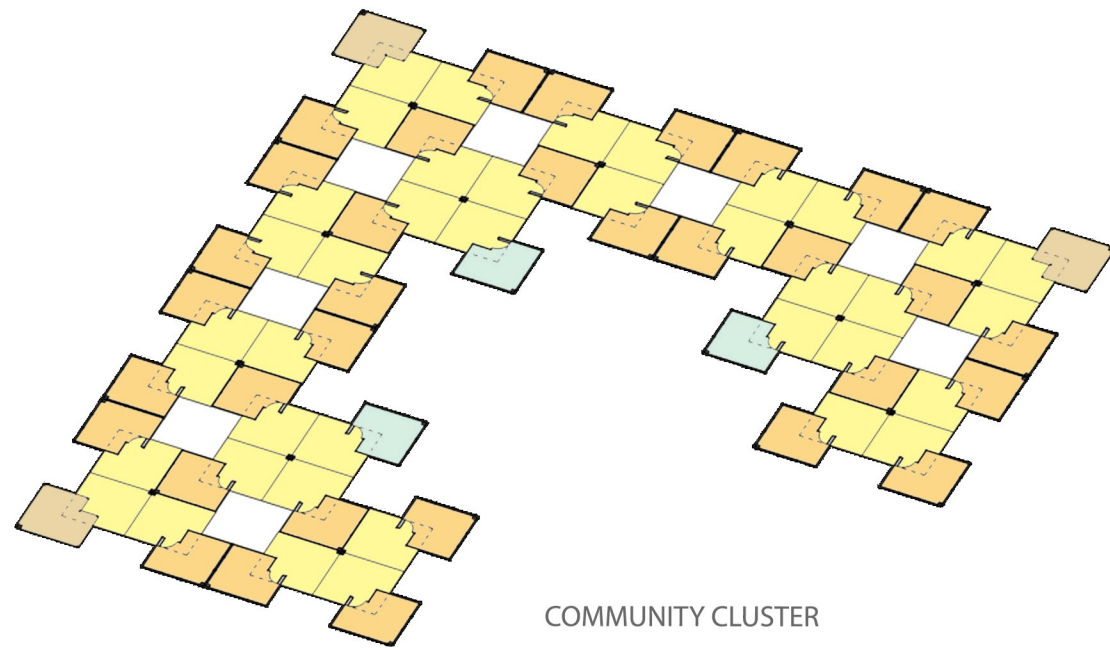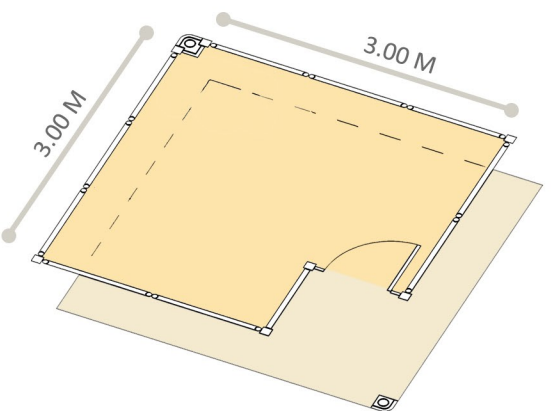
BEDROOM MODULE
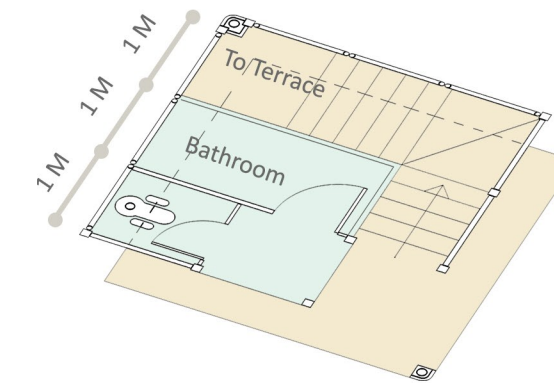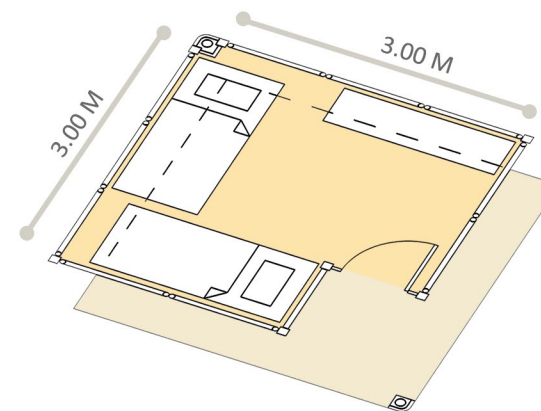(Bunk beds used for space efficiency)
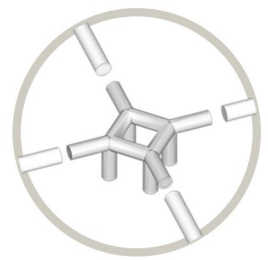
TOILET MODULE
(Waste is collected in a biodigestor container)
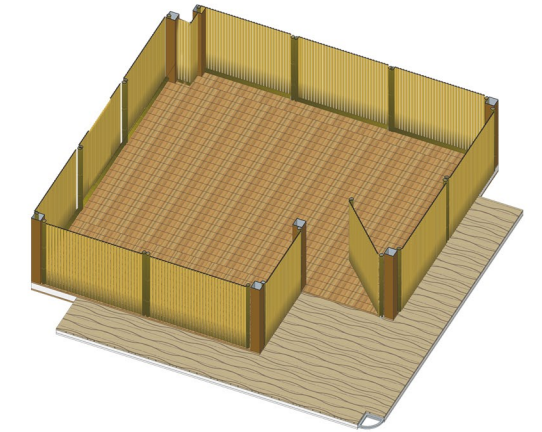
HABITATABLE SPACE - LIVING AREAS
(Less furniture to reduce the dead

ENCLOSED SPACES
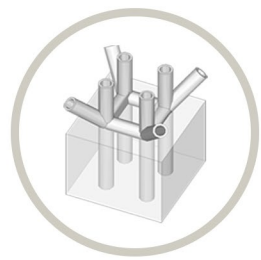
EXPANDABLE DECK

TOILET

JETTY

Project's Name   Habita(T)ide

Description   Different Modules and Cluster Formations with same Modules
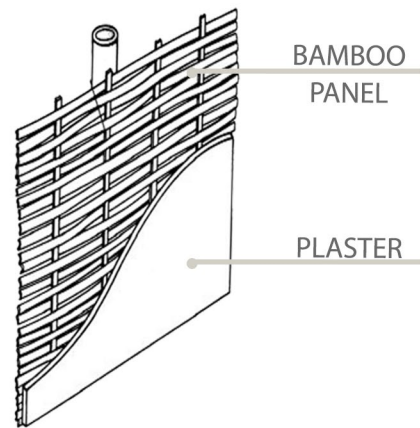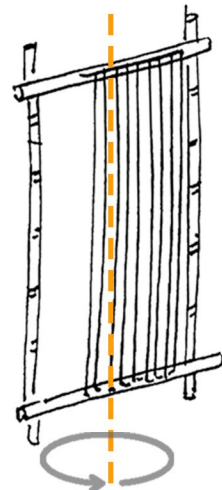
DETAIL AT THE APEX
Steel hollow cyrindrical members as structure

DETAIL AT THE BASE
Node is fixed and Concrete pad is cast

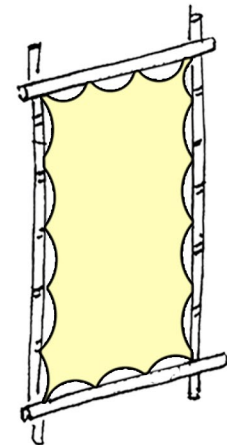## DETAIL AT THE CORNER
Interlocking and Bolting
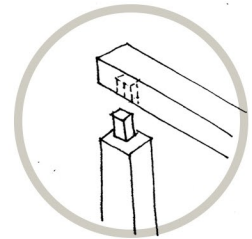
BAMBOO PANEL

PLASTER
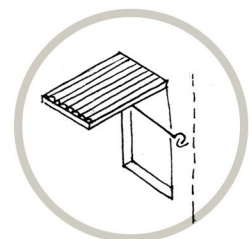
WOVEN BAMBOO INCREASES STRENGTH AND PLASTERING INCREASES BAMBOO LIFE

PIVOTED PANELS

CLOTH CAN BE USED FOR INTERNAL PARTITION

HEAD AND POST JOINERY

SIMPLE HOOK JOINERY
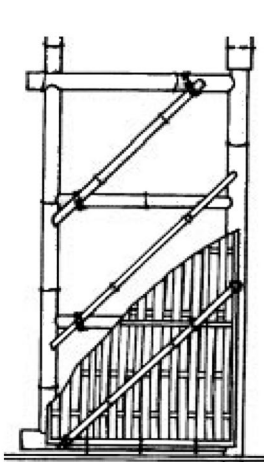
BAMBOO PANELS ARE BRACED TO MAKE IT MORE RESISTANT TO WIND AND THE WINDOW ITSELF PROVIDES WEATHER PROTECTION

SOIL

COIR

BAMBOO FRAME
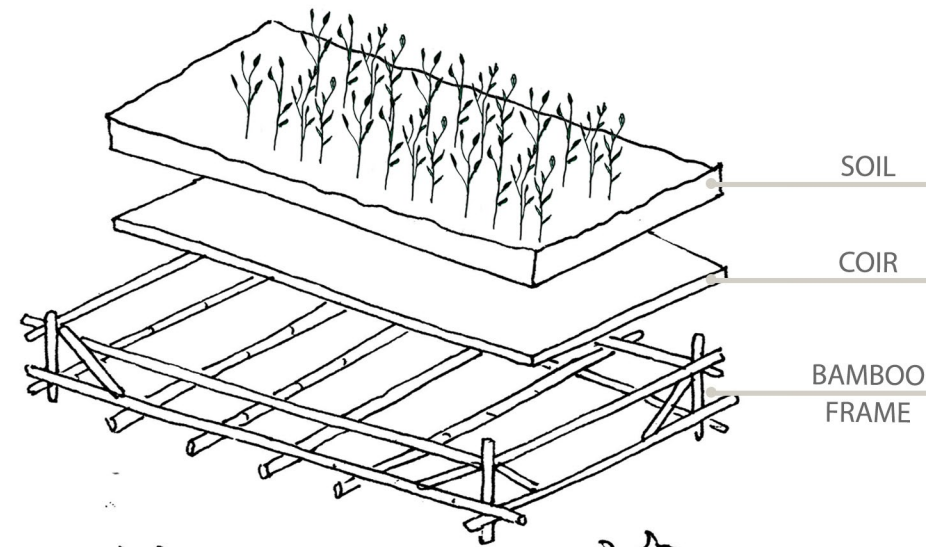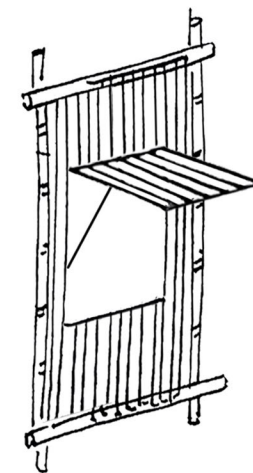
HYDROPONICS
TAKING CARE OF TWO LIVES : PLANTS & FISH
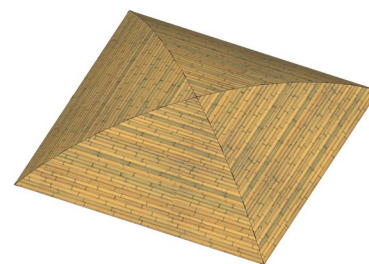
BAMBOO FORMWORK FOR ROOF COVERED WITH SPLIT BAMBOO
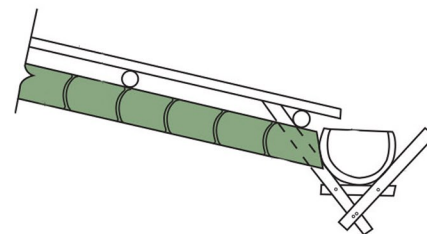
GUTTER DETAIL
WATER CAN BE HARVESTED AND STORED FOR DAILYUSE

WIND TURBINE
To generate electricity
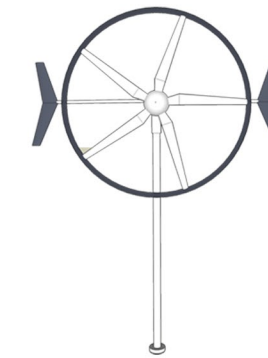
INCORPORATED TOILET PAN
Toilet pan +digester cap
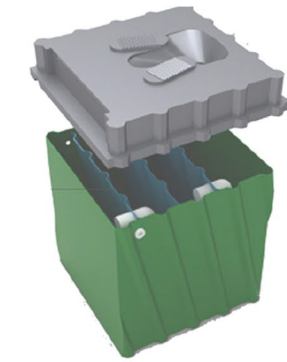
SOLAR PANEL
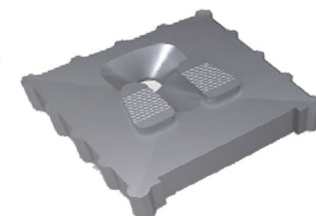
BIODIGESTOR TOILET
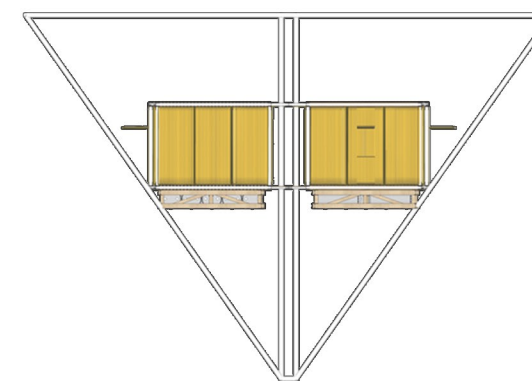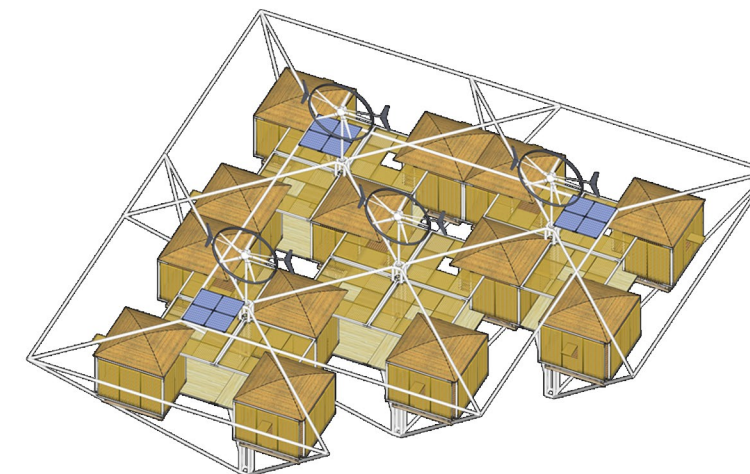
HORIZONTAL STACKING
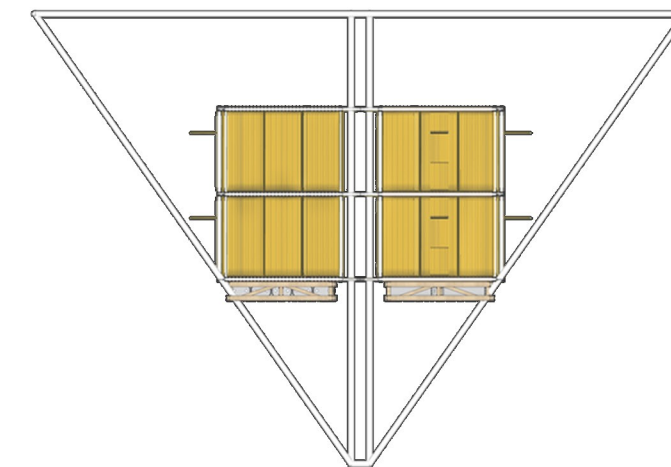
VERTICAL STACKING
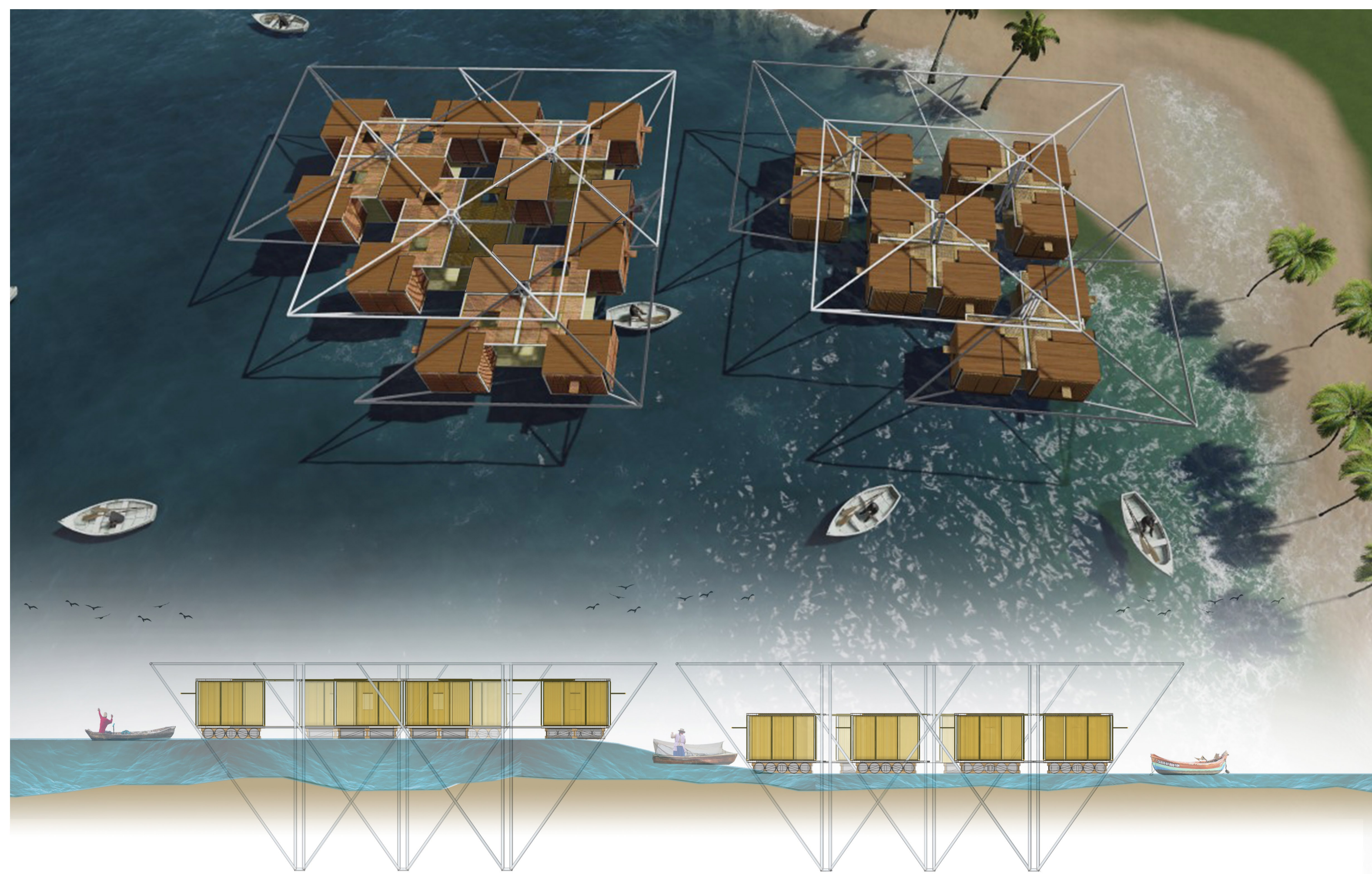
2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline

Project's Name   Habita(T)ide

Description   Construction Details and Services

JACQUES ROUGERIE FOUNDATION
SPACE AND SEA GENERATION
INSTITUT DE FRANCE

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline

Project's Name   Habita(T)ide

Description   Elevation - Transformation with sea level rise

JACQUES ROUGERIE
FOUNDATION
SPACE AND SEA GENERATION
INSTITUT DE FRANCE

DETAILED CONSTRUCTION COST

Items	Description of item	Unit	Unit Rate (USD)	Quantity	Total item cost
Steel Pipe	100 mmHollow cylindrical pipes	kg	$ 1.30	1000	$ 1,300.00
Wooden Pallet	No.1 Recycled Pallets as base to plastic drums	pcs	$ 7.50	13	$ 98.00
Plastic Drums	Waste and Recycled to create bouyancy effect	pcs	$ 7.50	120	$ 900.00
Hollow Steel Joinery Node	Cylindrical Pipe and Welding	kg	$ 1.20	50	$ 60.00
Wood Posts	10 feet length piece	piece	$ 1.00	60	$ 60.00
Bamboo	24 feet length piece	piece	$ 1.00	200	$ 200.00
Wooden Battens	For Flooring (10 feet a piece)	piece	$ 1.00	200	$ 200.00
Bamboo Mat	For Floor cover 2 ft x 5 ft	piece	$ 2.00	120	$ 240.00
Excavation	Digging and Filling	lump sum	$ 200.00	1	$ 200.00
Biodigestor Toilet	Toilet cap and digestor	piece	$ 150.00	2	$ 150.00
Electrical Fittings		lump sum	$ 300.00	1	$ 300.00
Plumbing and Sewage		lump sum	$ 300.00	1	$ 300.00
Water Tank		piece	$ 50.00	1	$ 50.00
Nails and Ropes	For Joinery (jute ropes)	lump sum	$ 50.00	1	$ 50.00
				TOTAL	$ 4,108.00
Transportation Cost	10 % of construction cost				$ 410.00
Labour Cost	Easy to construct. Done by community. Skilled labour for some tasks like excavation and steel frame erection	Lumpsum			$ 750.00
Miscellaneous	10% of Material cost				$ 410.00
				GRAND TOTAL	$ 5,678.00

TWO FAMILY CLUSTER MODULE
(8-10 PEOPLE EACH)

NOTE-

1. The cost assumed are subject to change and it can be cheaper if the materials are locally sourced. This will also reduce the transportation cost.

2. This cost (5678 AUD) is for a two family cluster module, hence each family house will cost around (2839 AUD). Use of recycled materials saves on cost

3. The house is easy to construct and the community members can build their own houses (self-buildable).

4. The community can also use an incremental process and construct and expand their houses over a period of years.

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Grand Prix Award : Sea Level Rise : African Coastline
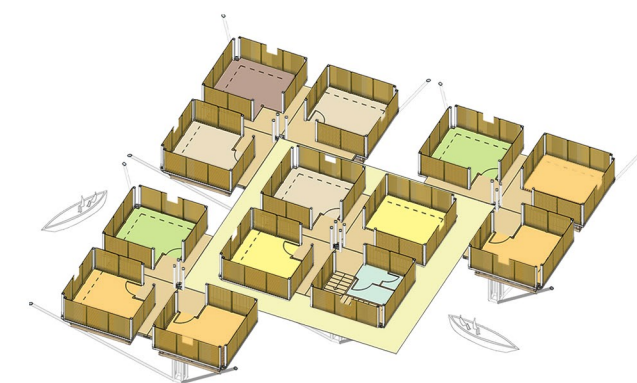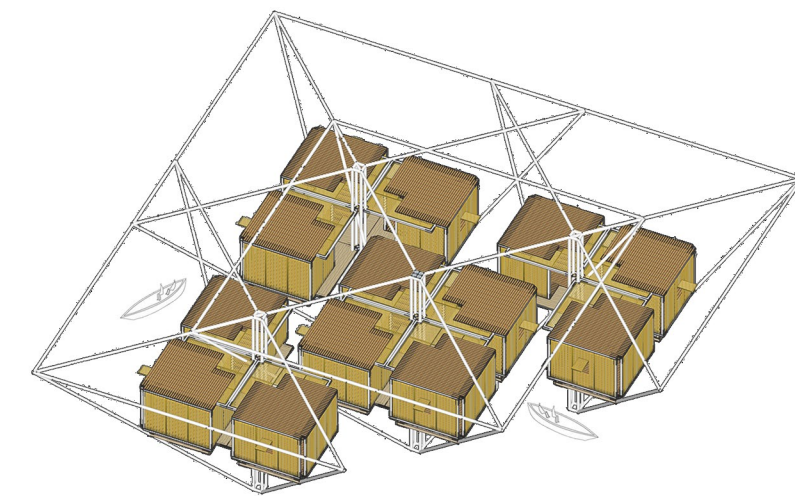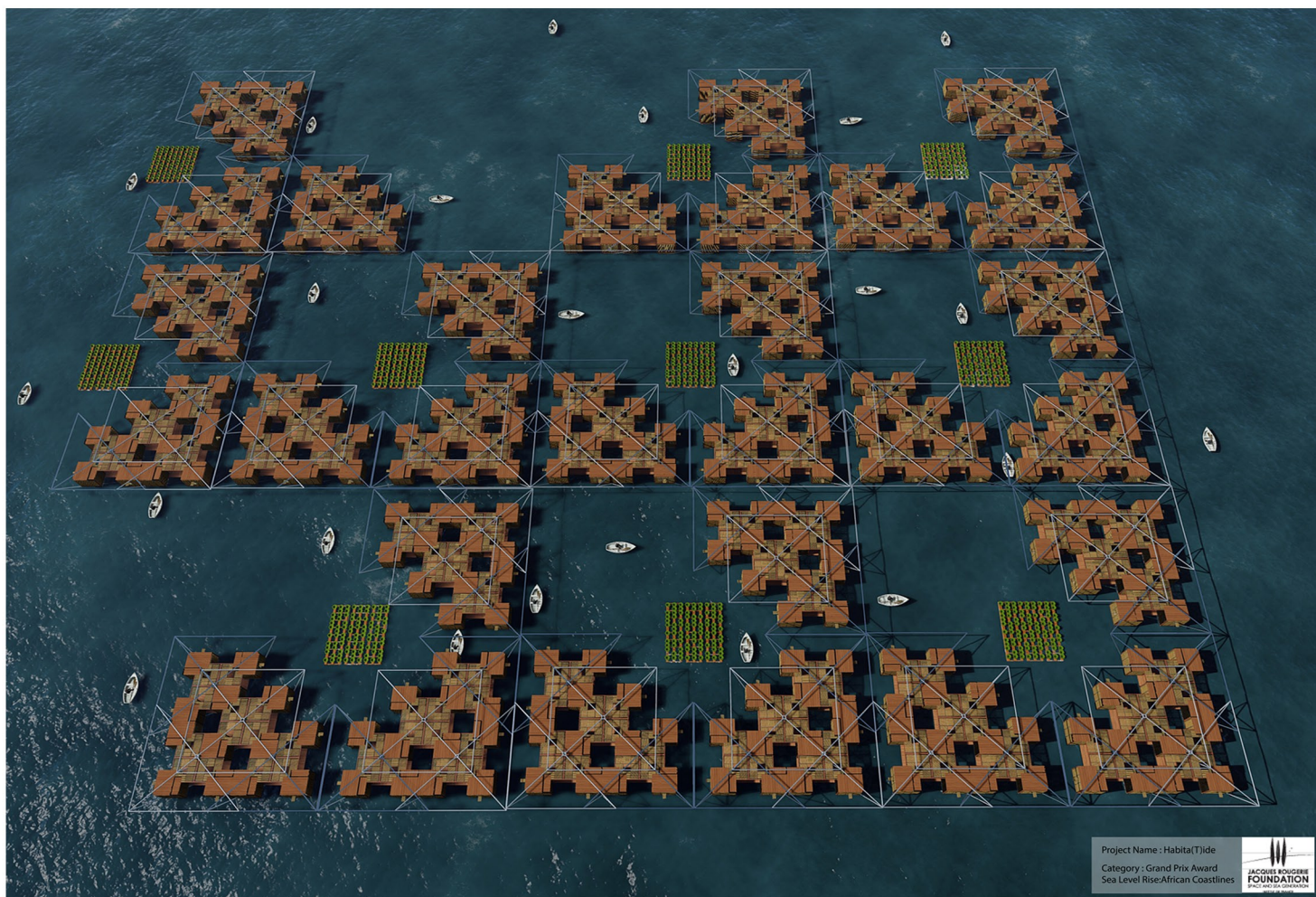
Project's Name   Habita(T)ide

Description   Detailed Construction Cost

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FOUNDATION
SPACE AND SEA GENERATION
INSTITUT DE FRANCE

VIEW 1 : COMMUNITY CLUSTER

VIEW 2 : HYDROPONIC COMMUNITY PLANTATION

VIEW 3 : DAILY ACTIVITY - FISHING / ENTANGLING / DRYING

VIEW 4 : INTERIOR VIEW

Project Name : Habita(T)ide
Category : Grand Prix Award
Sea Level Rise:African Coastlines

JACQUES ROUGERIE
FOUNDATION
SPACE AND SEA GENERATION

2021 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : **Grand Prix Award : Sea Level Rise : African Coastline**

Project's Name — Habita(T)ide

Description — 3D Visualizations : Renders

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