



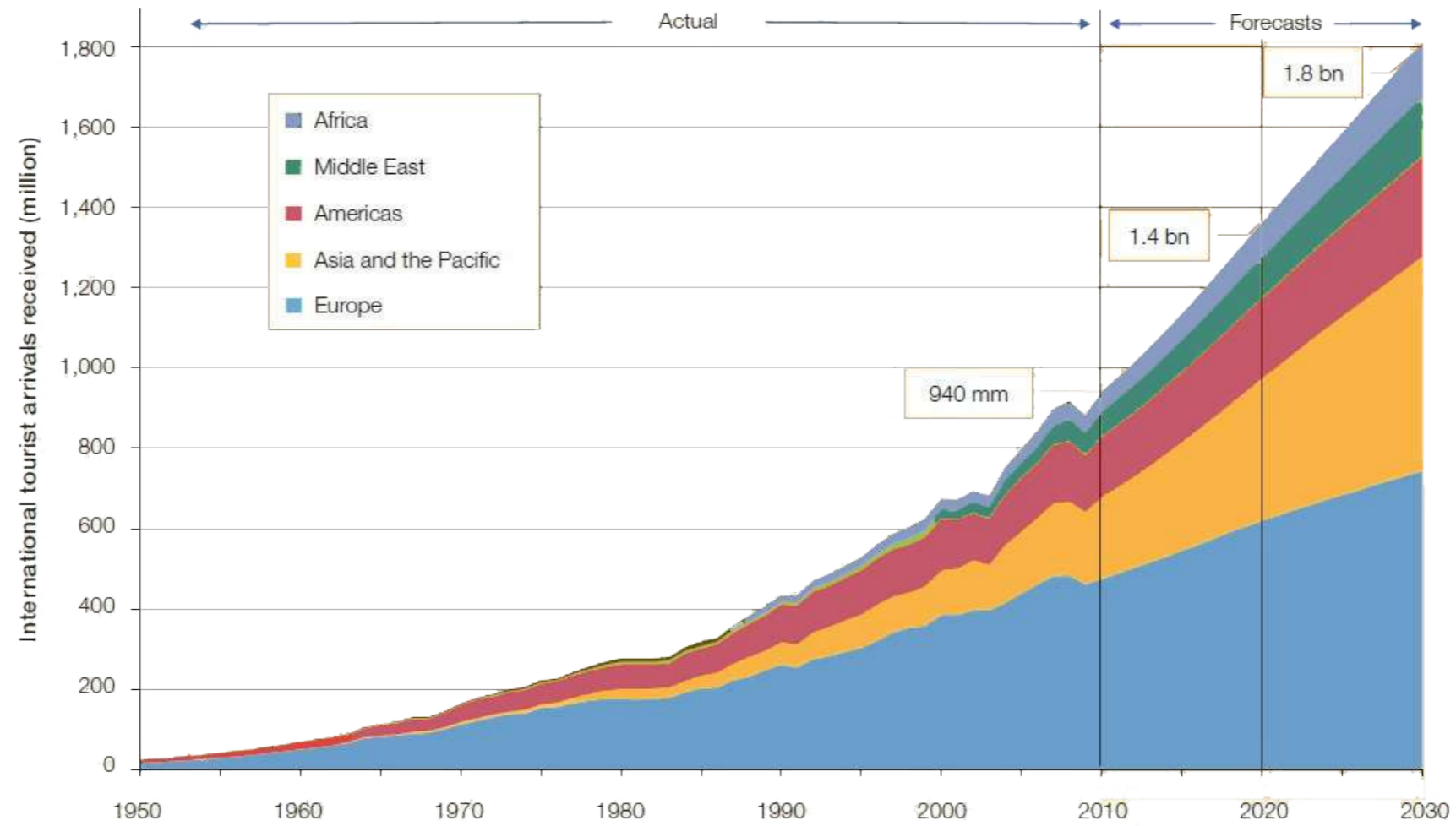
P5 PRESENTATION IVANA KAFEDJIAN

BUILDING WITH RECYCLED
PLASTIC AS A WAY OF
EMPOWERING LOCAL
COMMUNITIES

A CASE STUDY OF BALI,
INDONESIA

Student number: 6467033
Tutors: Stephan Verkuijlen
Jos de Krieger
Gilbert Koskamp
Date: 23/06/2023

TOURISM FORECAST FOR 2030



By 2030

1.8bn

people will travel internationally.**

An estimated

8.9tn

to the global economy in 2019.***

In 2019

1/10

of all jobs globally were travel related.***



BALI: MOST POPULAR TOURIST DESTINATION





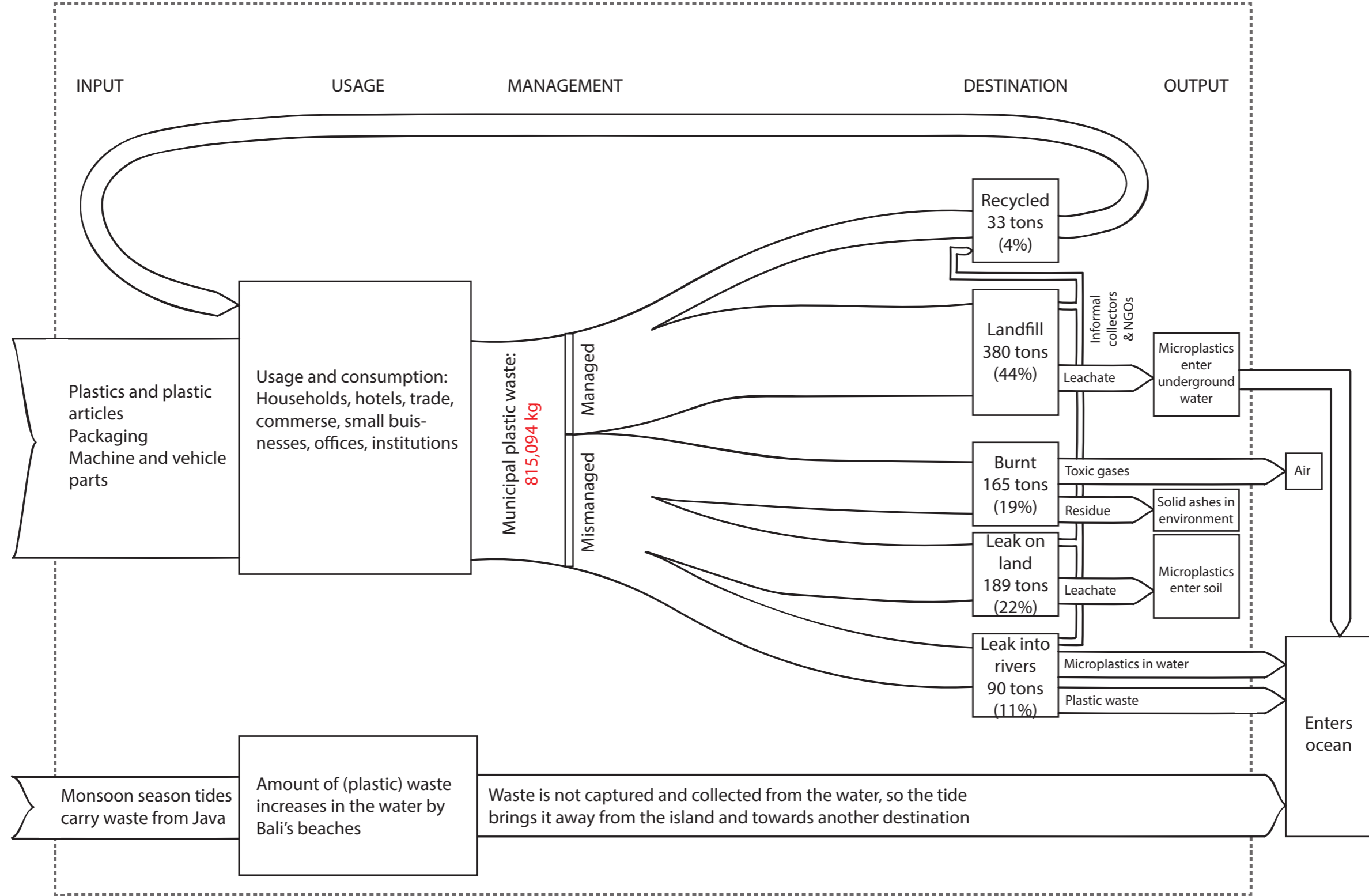


OVERTOURISM

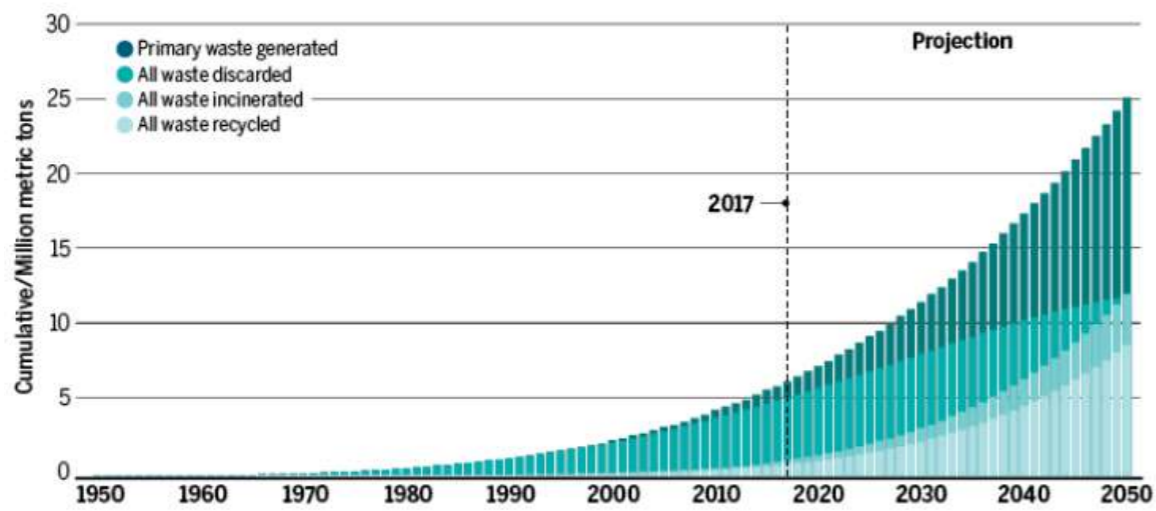
overcrowding of tourists on a holiday destination, literally “too much tourism”

overwhelming pollution
lack of authenticity
dominance of foreign businesses
displacement of local residents

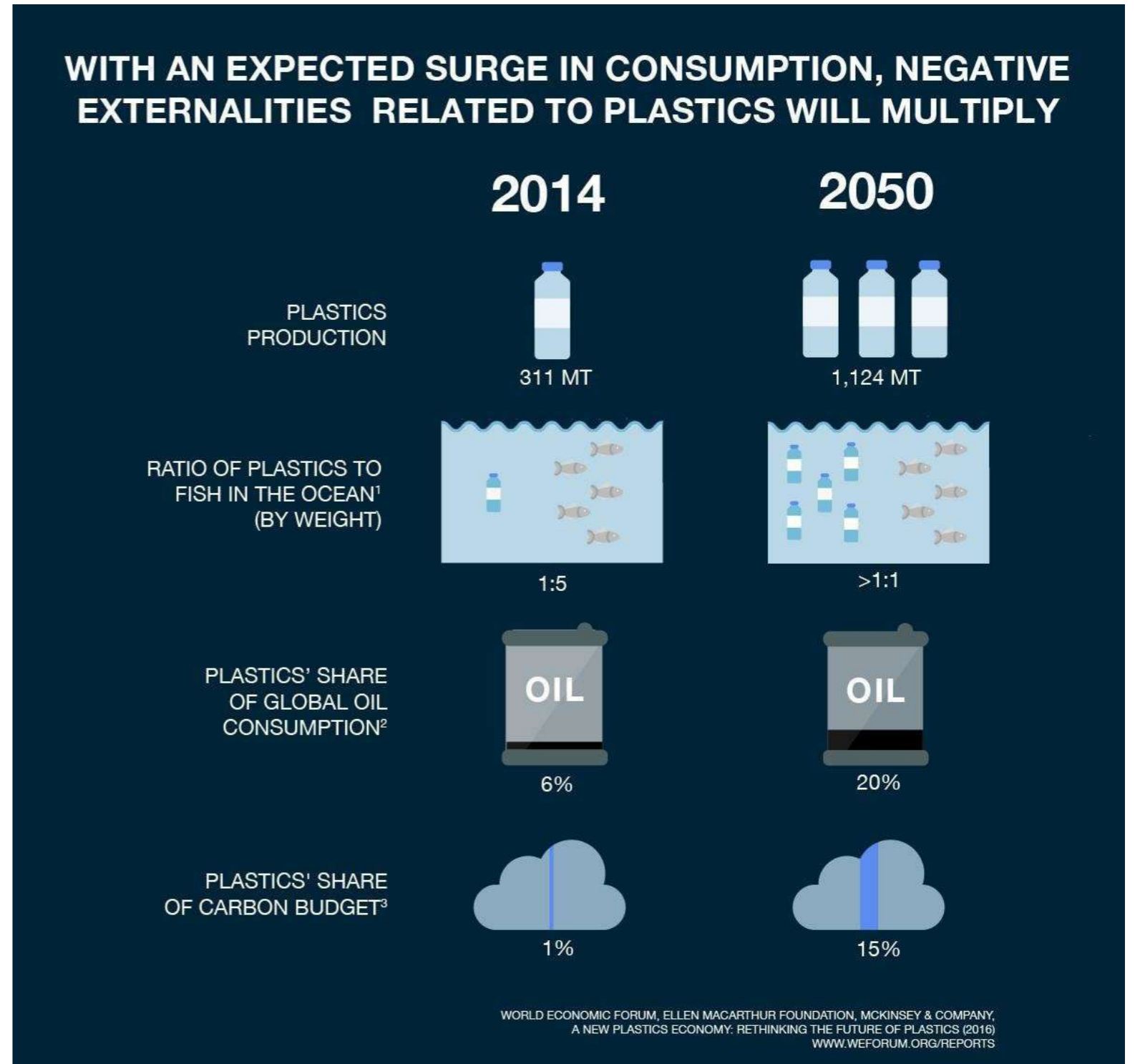
Bali, per day



GLOBAL PREDICTIONS FOR PLASTIC WASTE



Projection for the generation and management of plastic waste in the coming 30 years (Geyer et al., 2017)



QUESTION

How can we, as architects, use this growing supply of materials to provide more sustainable tourism opportunities at locations with similar popularity, and at the same time, give back to local communities

THEMATIC RESEARCH

What are the available technologies and their products?
What can they be used for in the context of Bali?
What would the scale of the effect be?

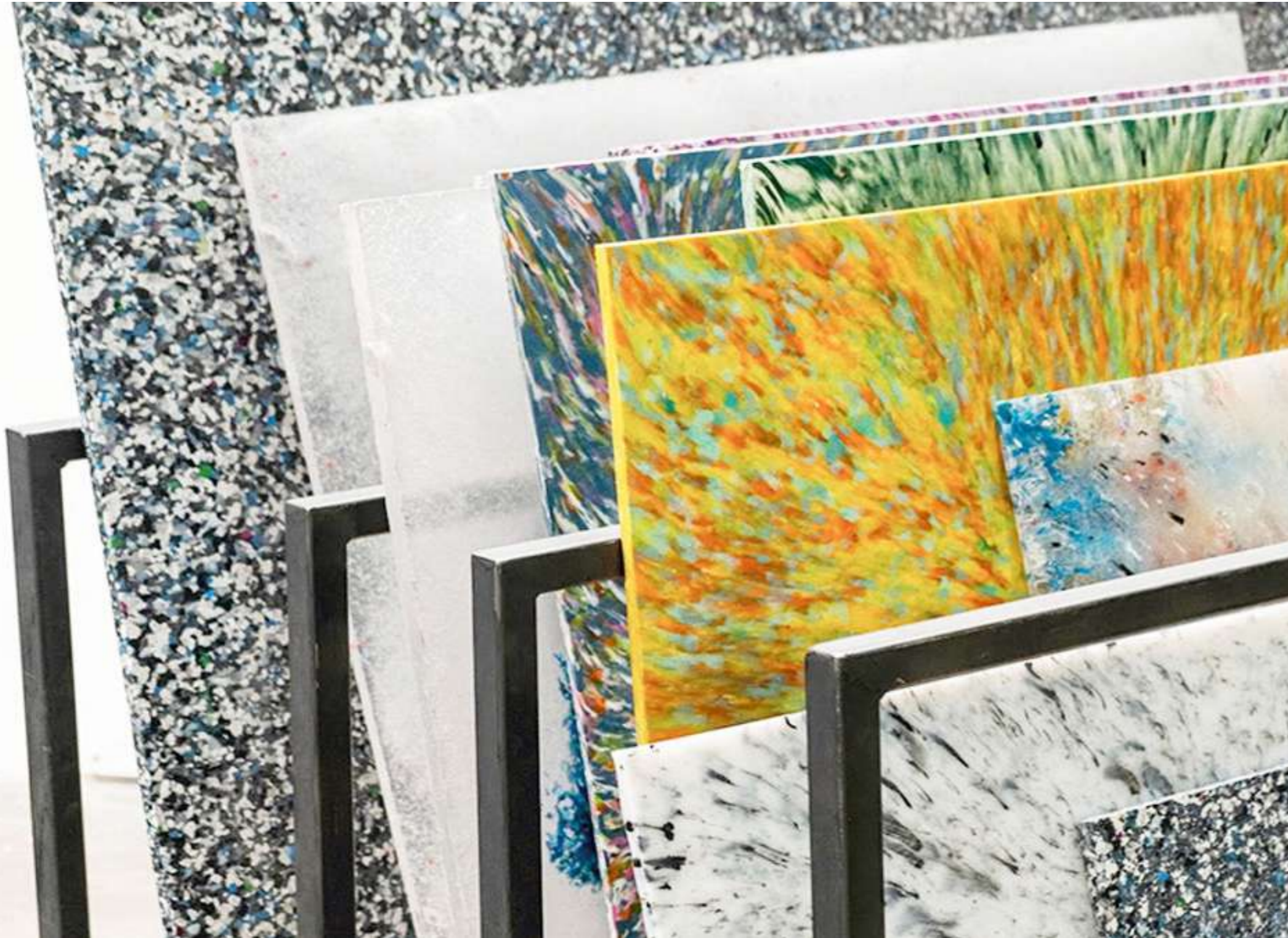
3D PRINTER FILAMENT



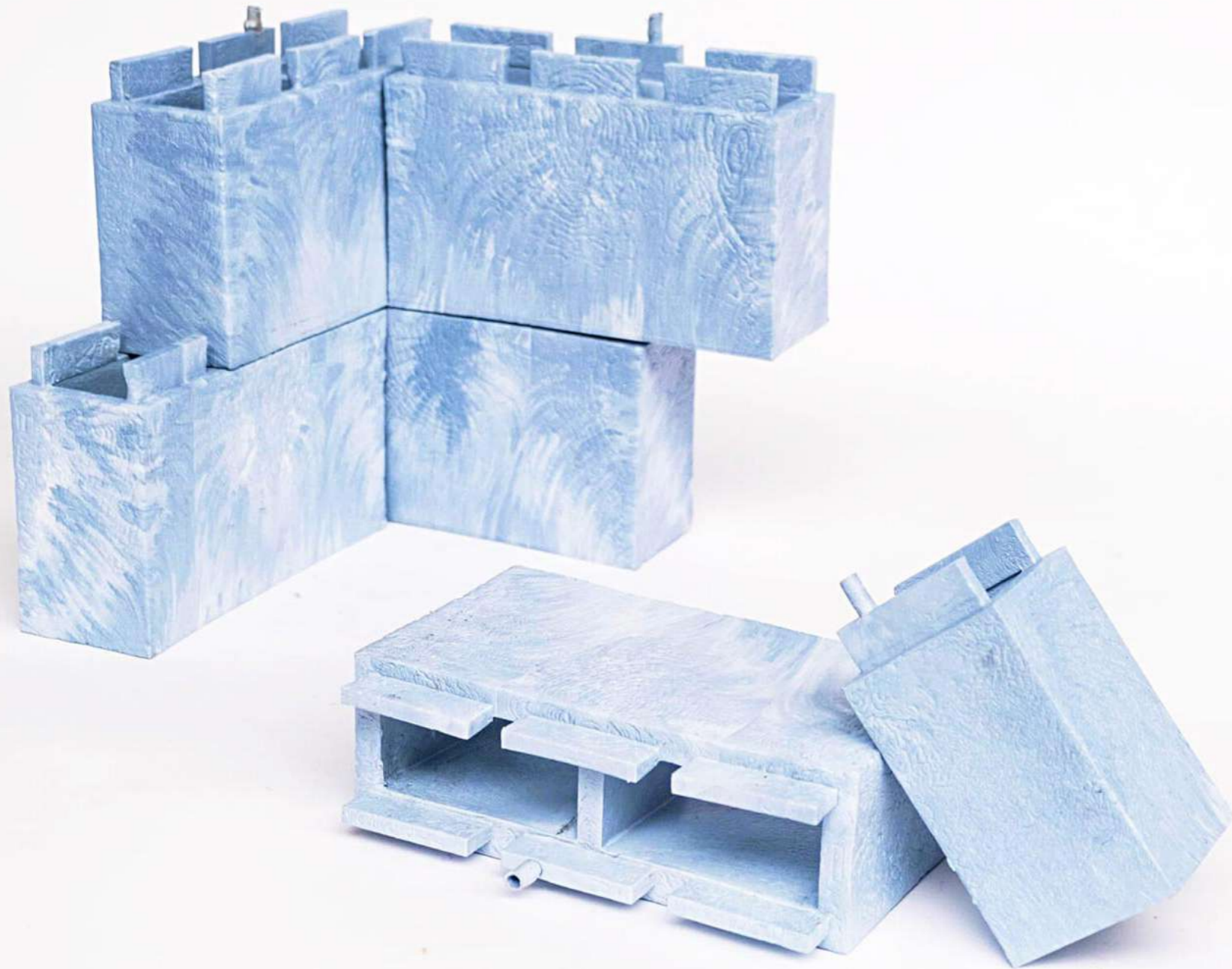
EXTRUSION



SHEET PRESSING



INJECTION MOULDING



COMPRESSION INTO BLOCKS



WHAT DOES THAT MEAN FOR BALINESE ARCHITECTURE?

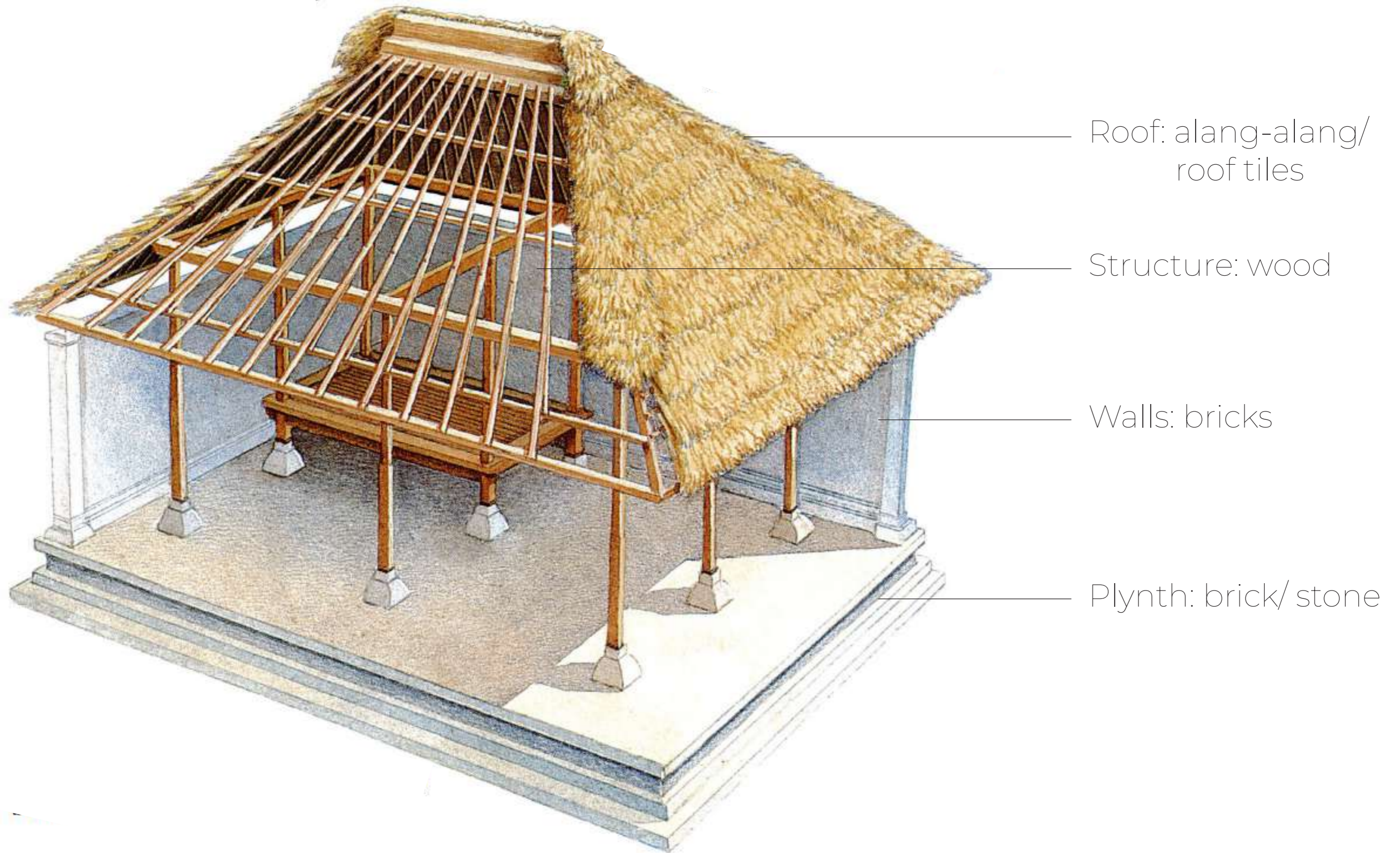
What if all of the plastic waste was collected and recycled into building materials?

How can these technologies be applied in the local architectural context?

BALI'S COMPOUND AS A MEASURING UNIT



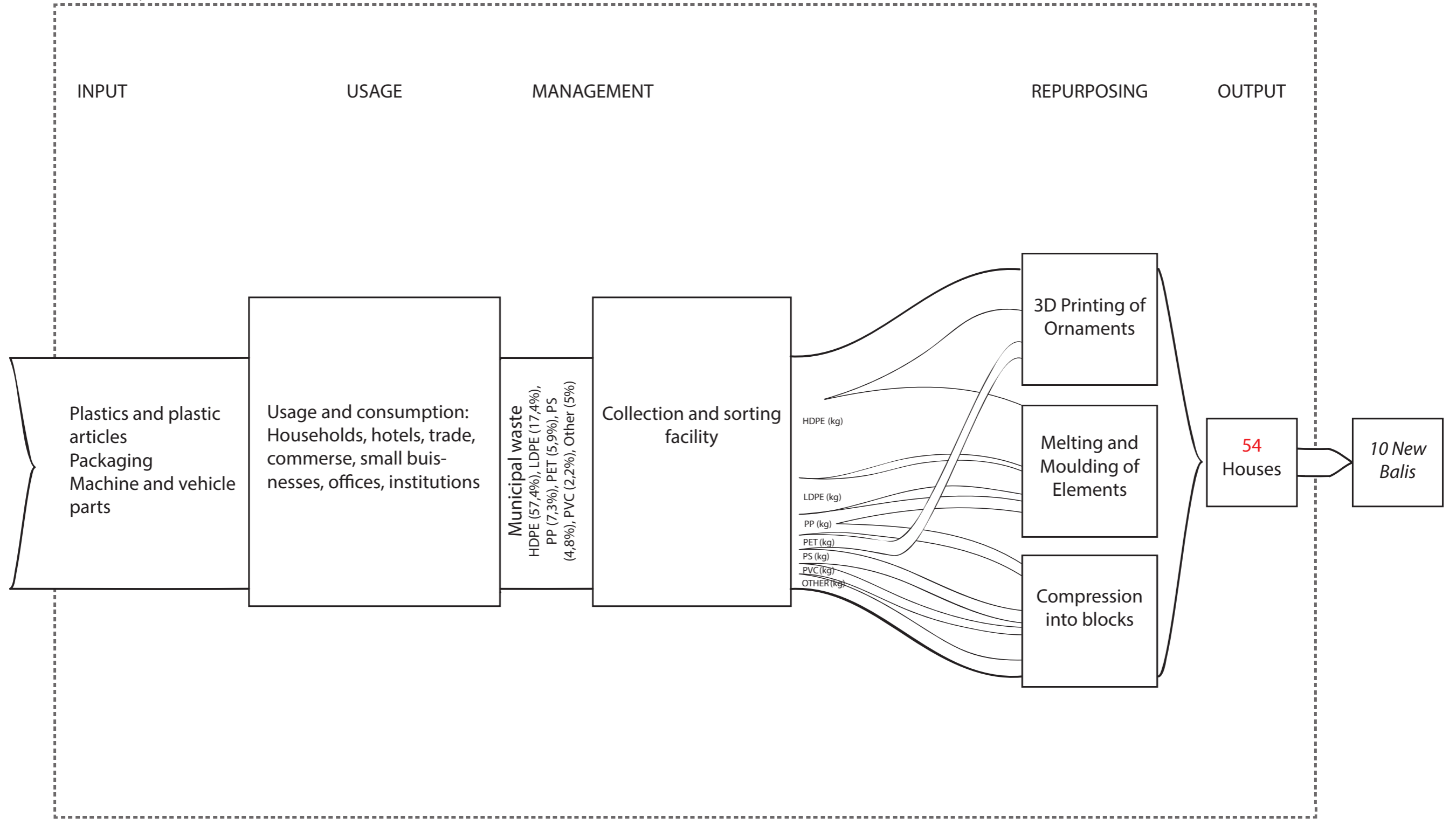
BALI'S COMPOUND AS A MEASURING UNIT

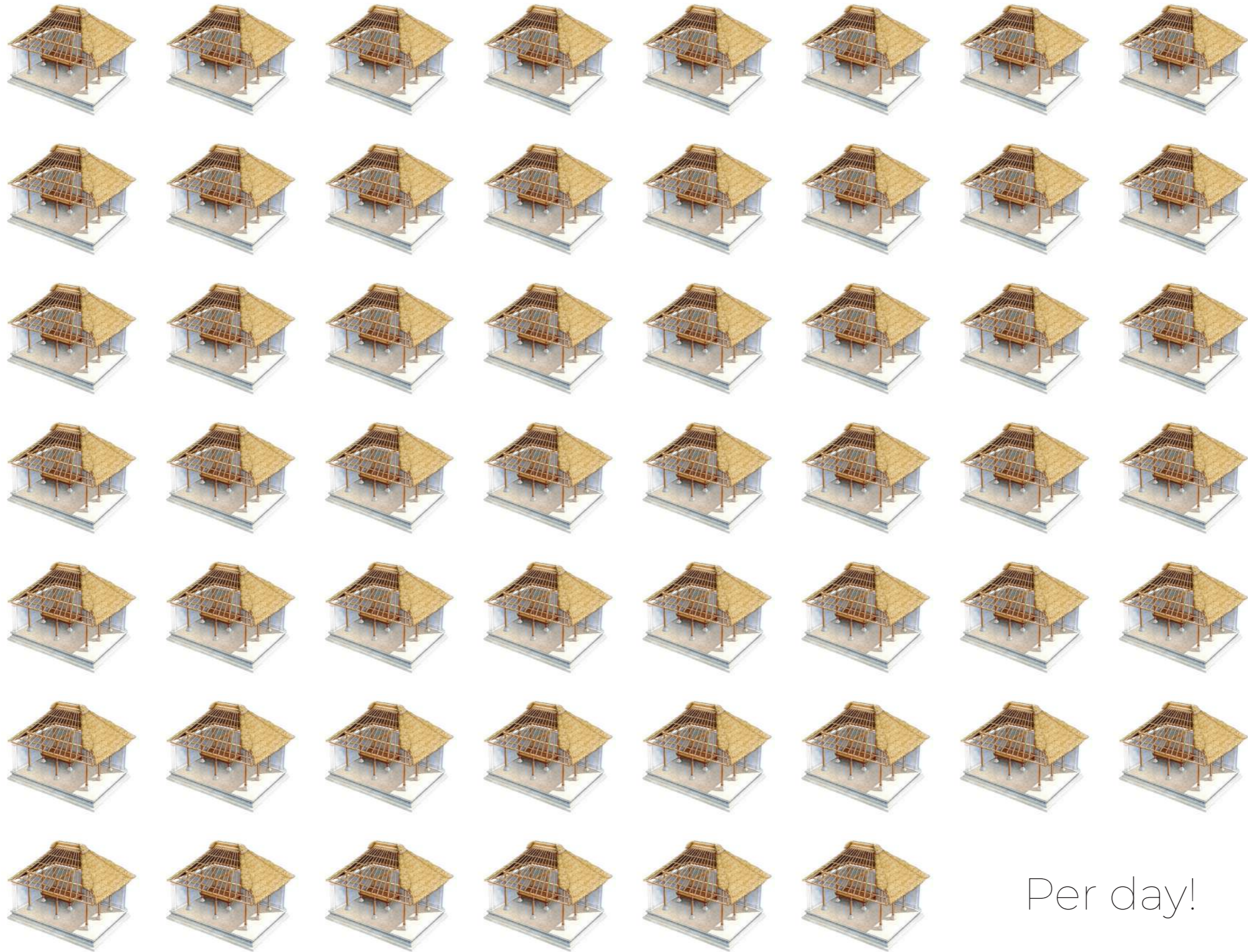


BALI'S COMPOUND AS A MEASURING UNIT

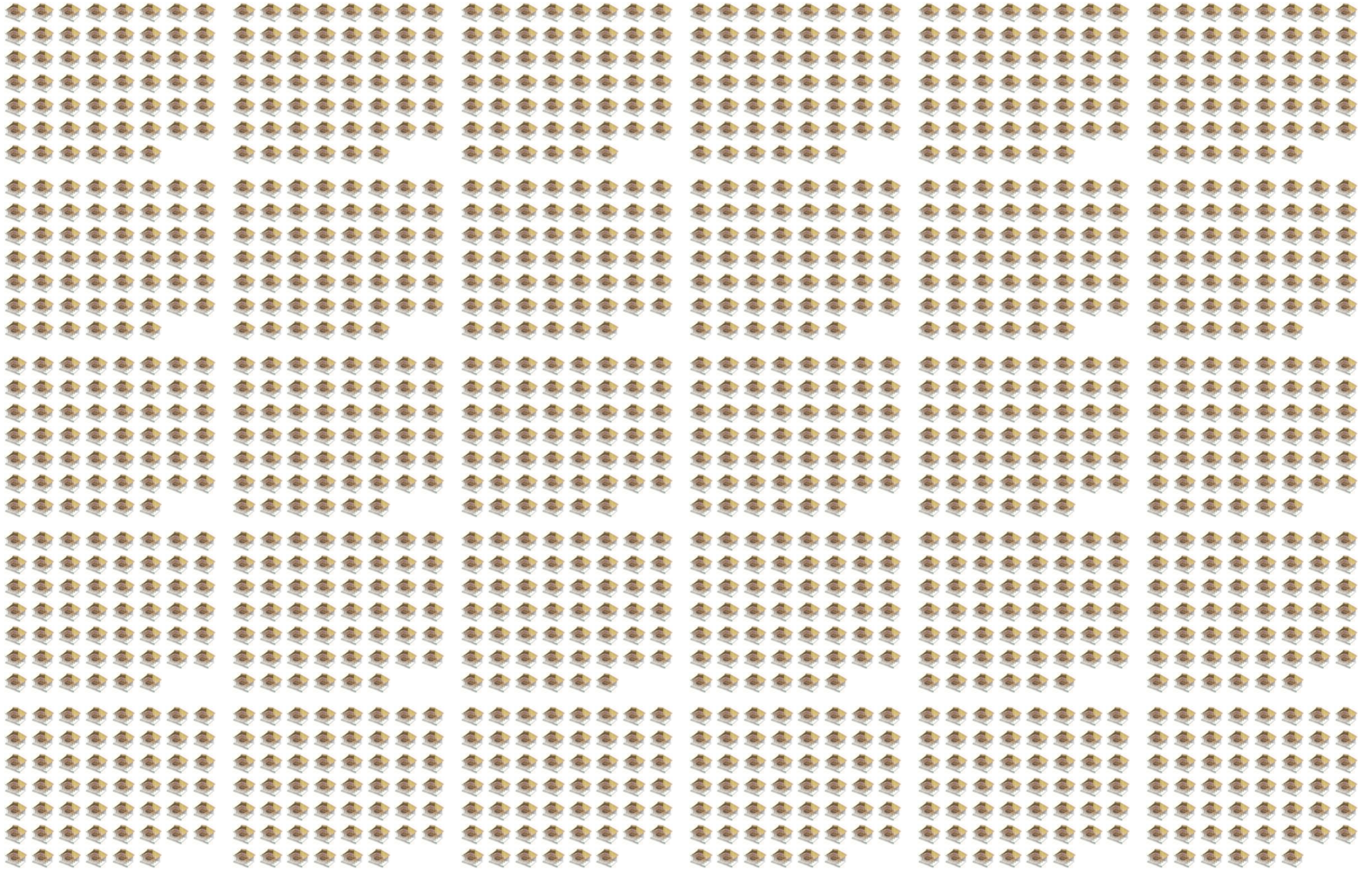


Bali, per day





Per day!



10 NEW INDONESIAN TOURISM HUBS



DESIGN RESEARCH

What can we build with those materials that gives back to the local community and provides more sustainable tourism alternatives?



WHO ARE THEY?

- Started as a women's centre
- mental support, education and capacity- building
- Gradually grew to include more people



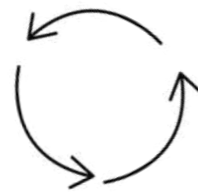


VISION FOR THE FUTURE

- Have a representative site
- Host people overnight
- Have more foreign guests



Local
Community



Tourists



Class
Attendees





LOVINA

UBUD

SEMINYAK

CANGGU

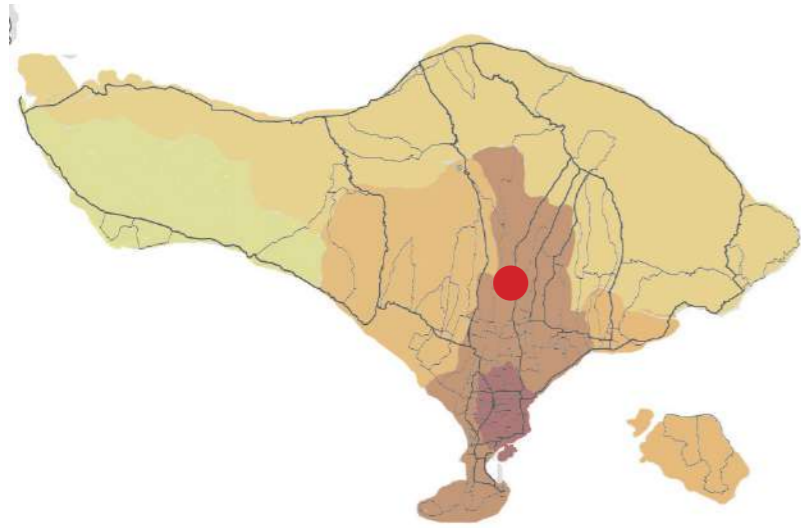
KUTA

DENPASAR

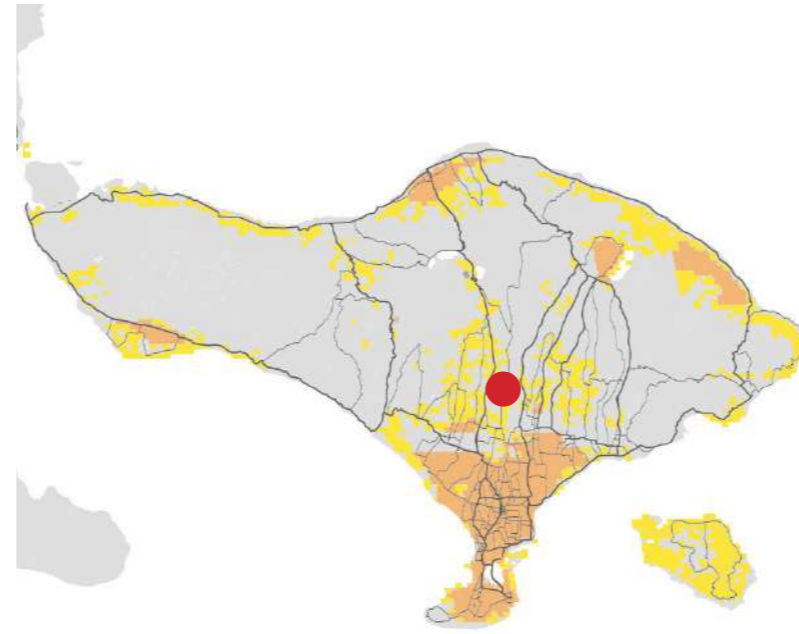


0 12,5 25 50 Kilometers

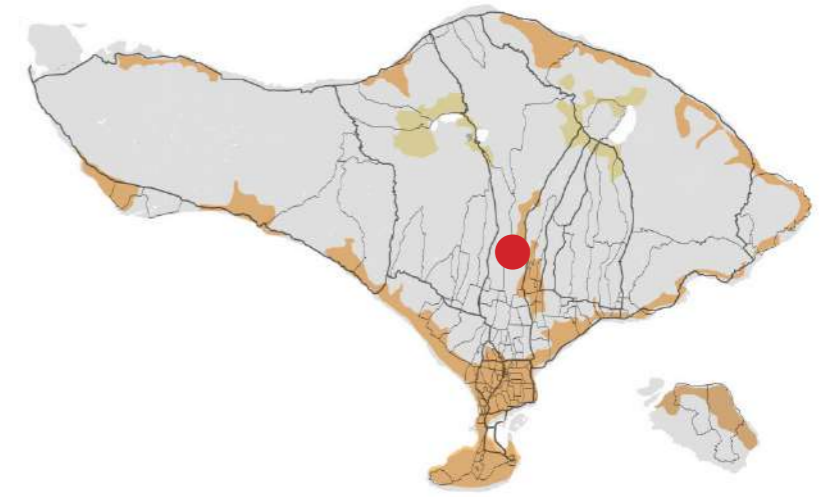
SITE LOCATION



Population density



Tourist presence areas



Planned tourism development



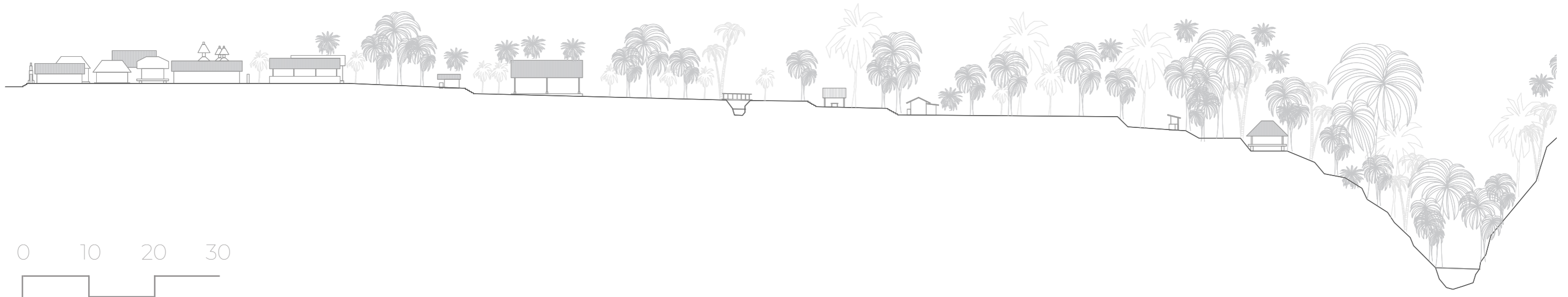
village context



natural context



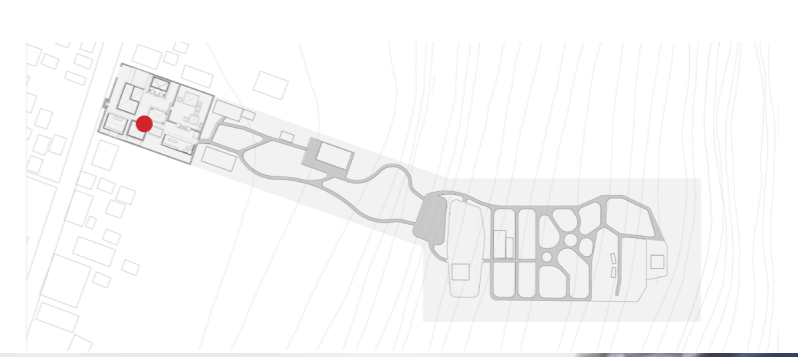
CURRENT SITUATION



SHOP



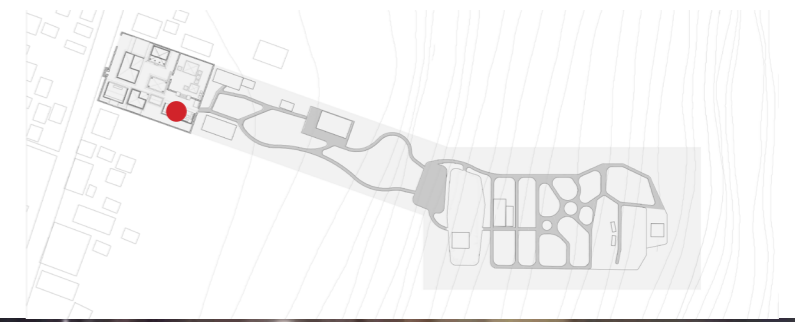
RICE STORAGE



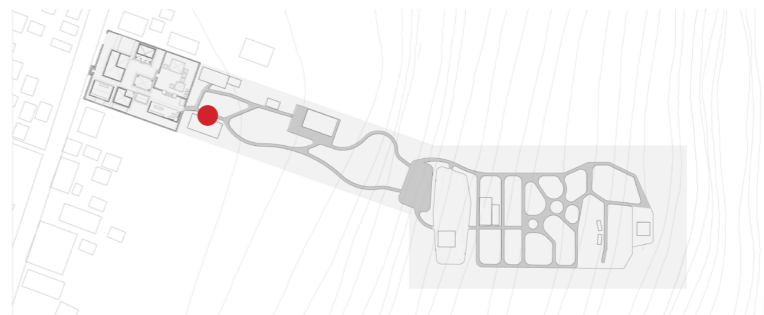
KITCHEN



KITCHEN



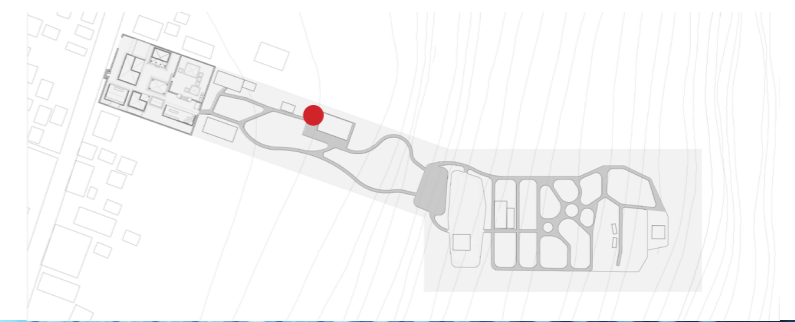
FARM



MEETING SPACE

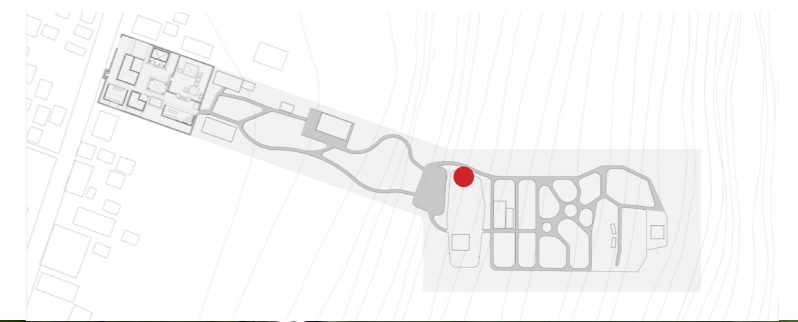


MAIN COMMUNITY SPACE

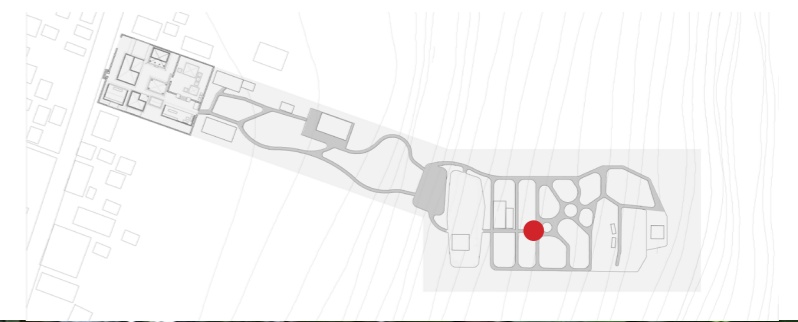


Activity Area

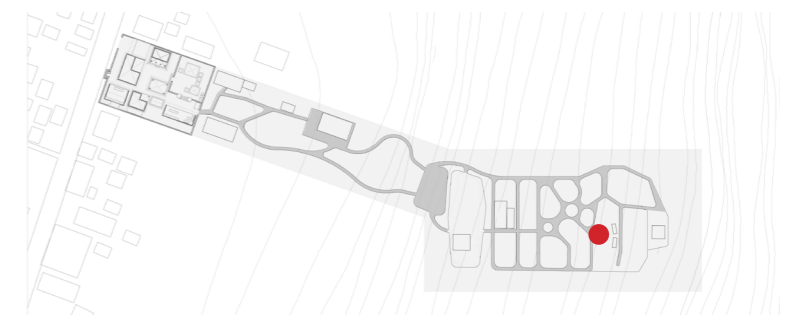
ACTIVITY AREA



GARDEN



ACTIVITY AREA 2



MEDITATION BOOTH



PROGRAMME

CURRENT PROGRAMME

Cooking/ Catering
Dining
Cooking classes - locals and visitors
Shop
Yoga
Meditation
Meetings - locals and visitors
Farm
Gardening
Coconut oil making
Soap making
Sewing clothes
Painting
Batik
Children's class & workshop
Making offerings
Language classes
Bar/Cafe

OFF-SITE

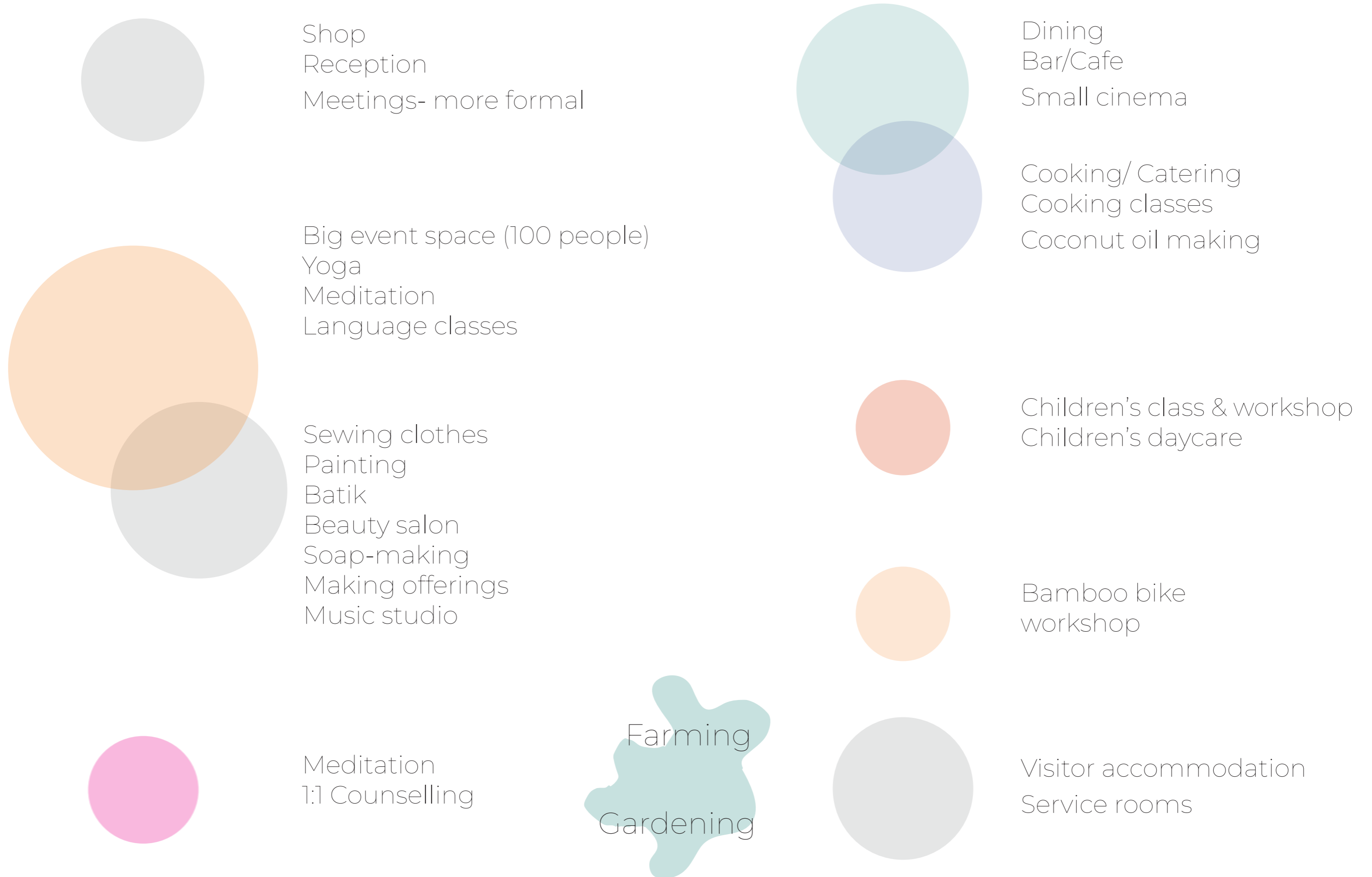
1:1 Counselling
Women's shelters (renting)
Stores

PROGRAMME THEY WISH TO ADD

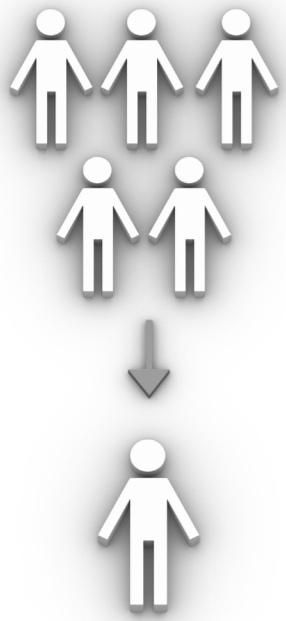
ON-SITE:

Big space- 100 people
Small cinema
Jaccuzzi
Bamboo bike workshop
Music studio
1:1 Counselling
Women's shelters
Visitor accommodation
Children's daycare
Small group activities
Beauty salon
Reception area
Service rooms

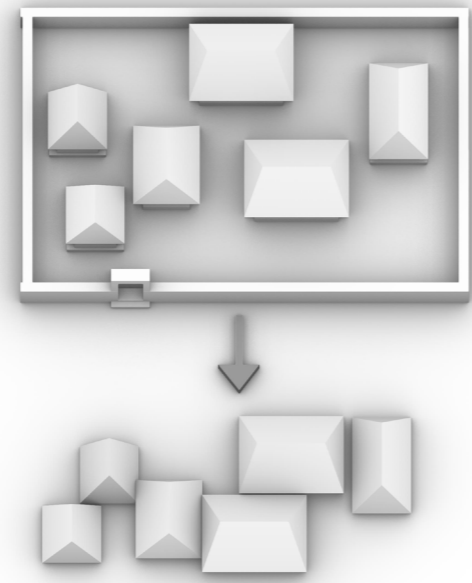
PROGRAMME BY SPACES



LEADING DESIGN CONCEPTS



Degrees of privacy



A system of roofs

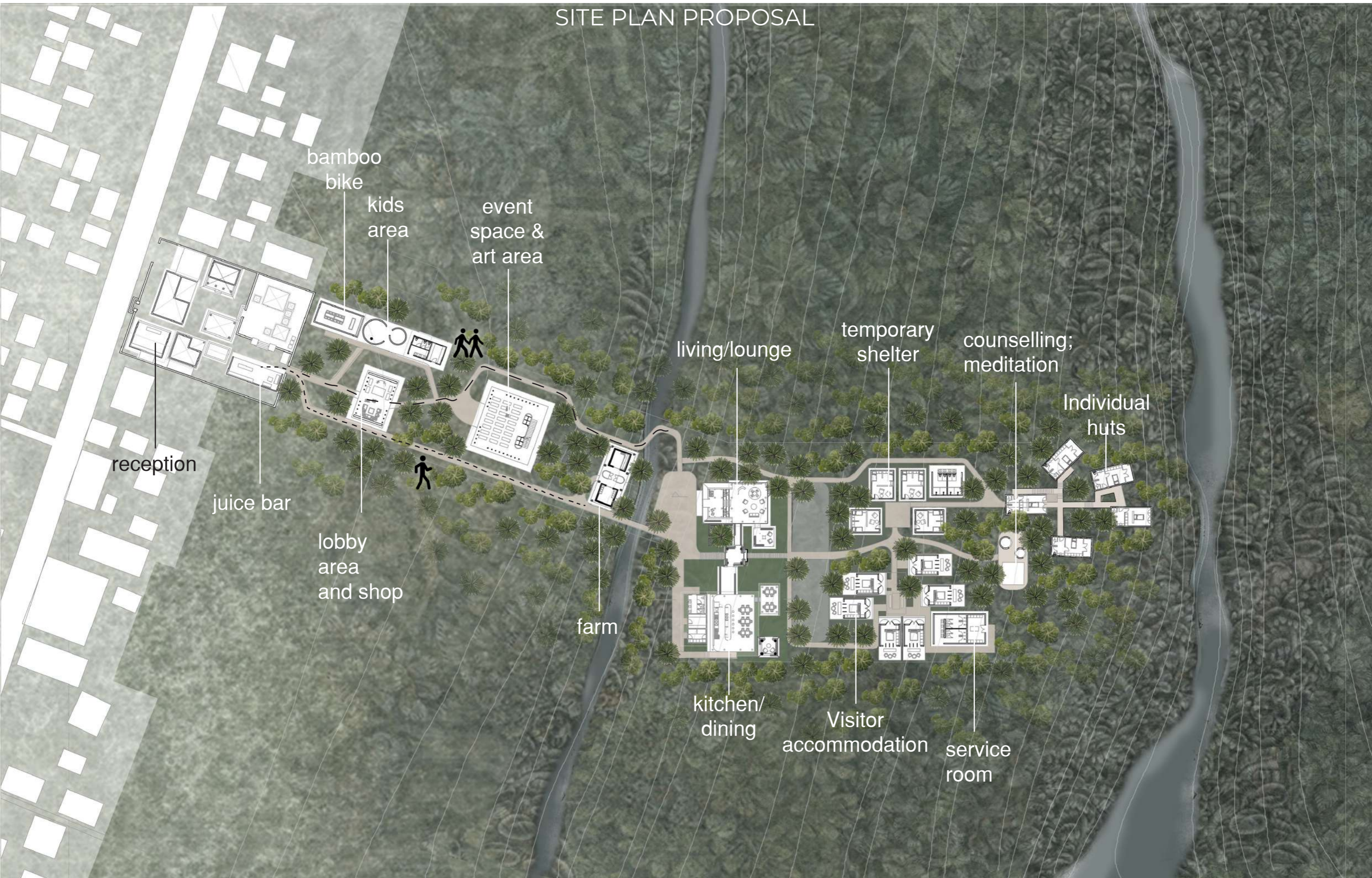


Element in repetition



Community participation

SITE PLAN PROPOSAL



0 10 20 30



Public


Common

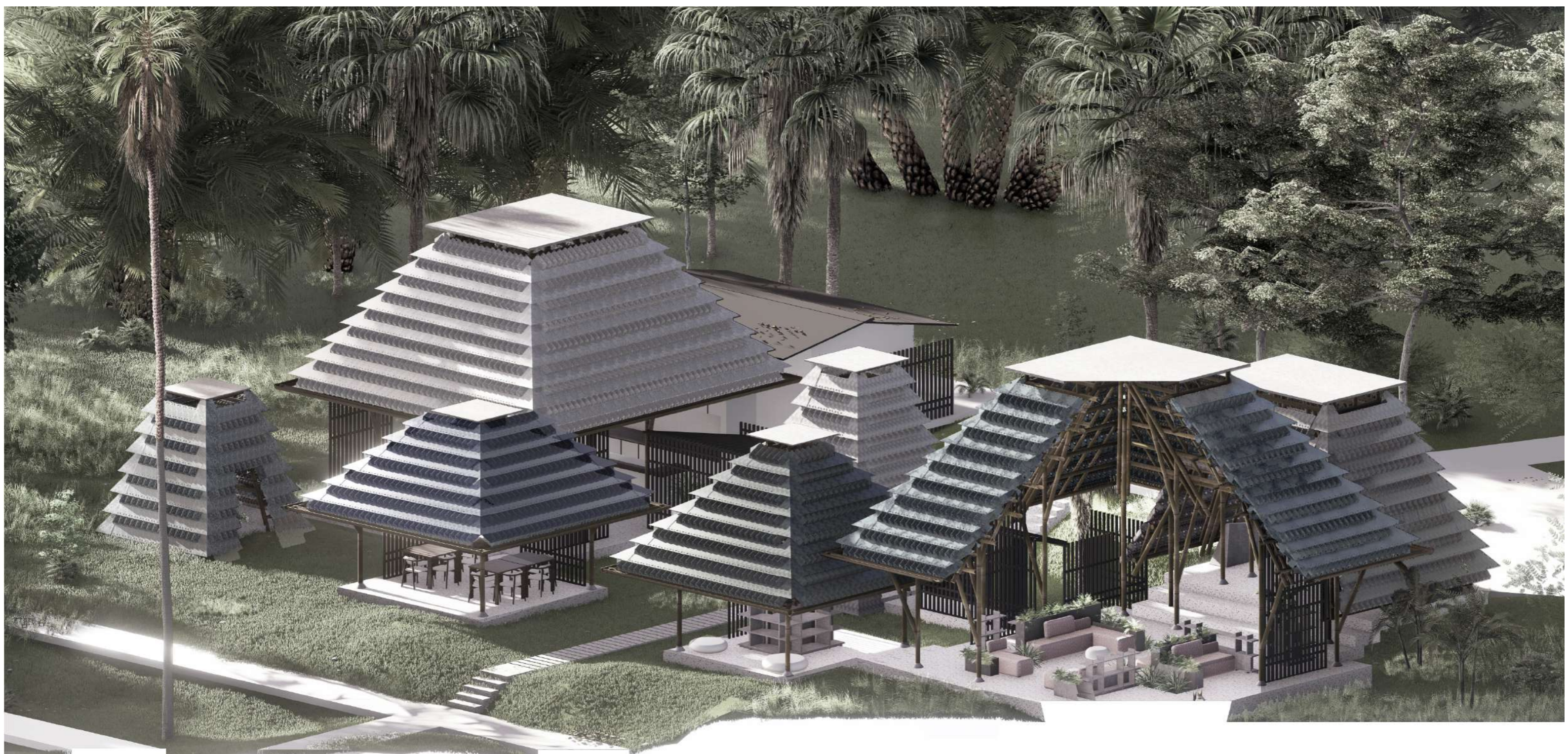
Private

SECTION THROUGH SITE



0 10 20 30





LIVING PAVILION PLAN

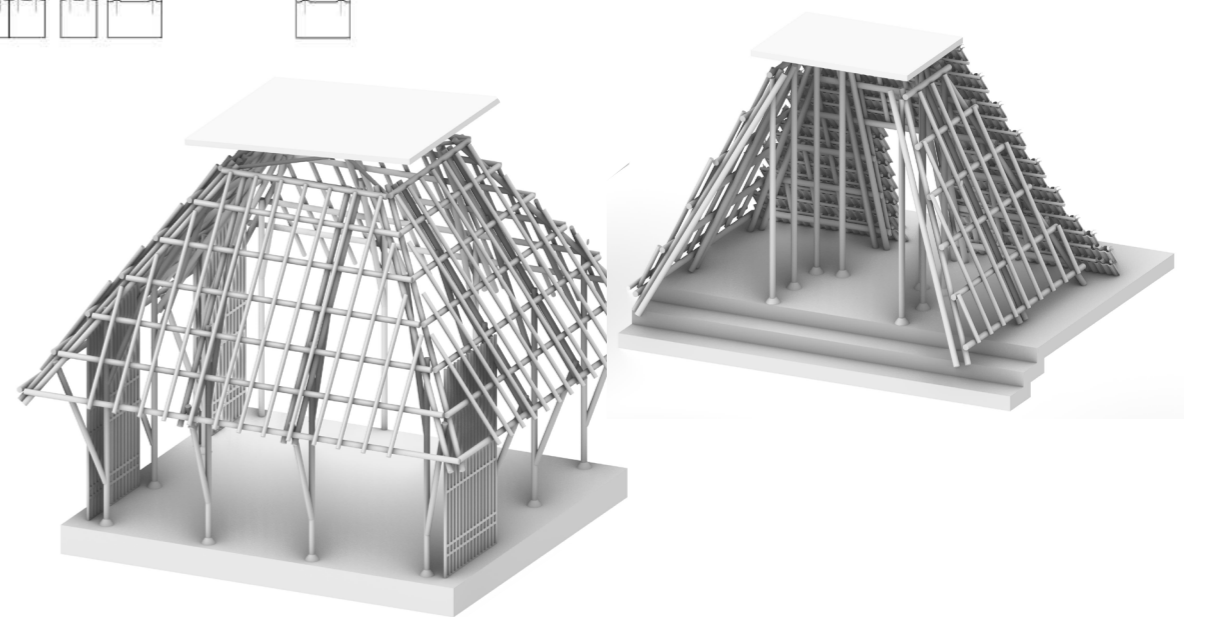
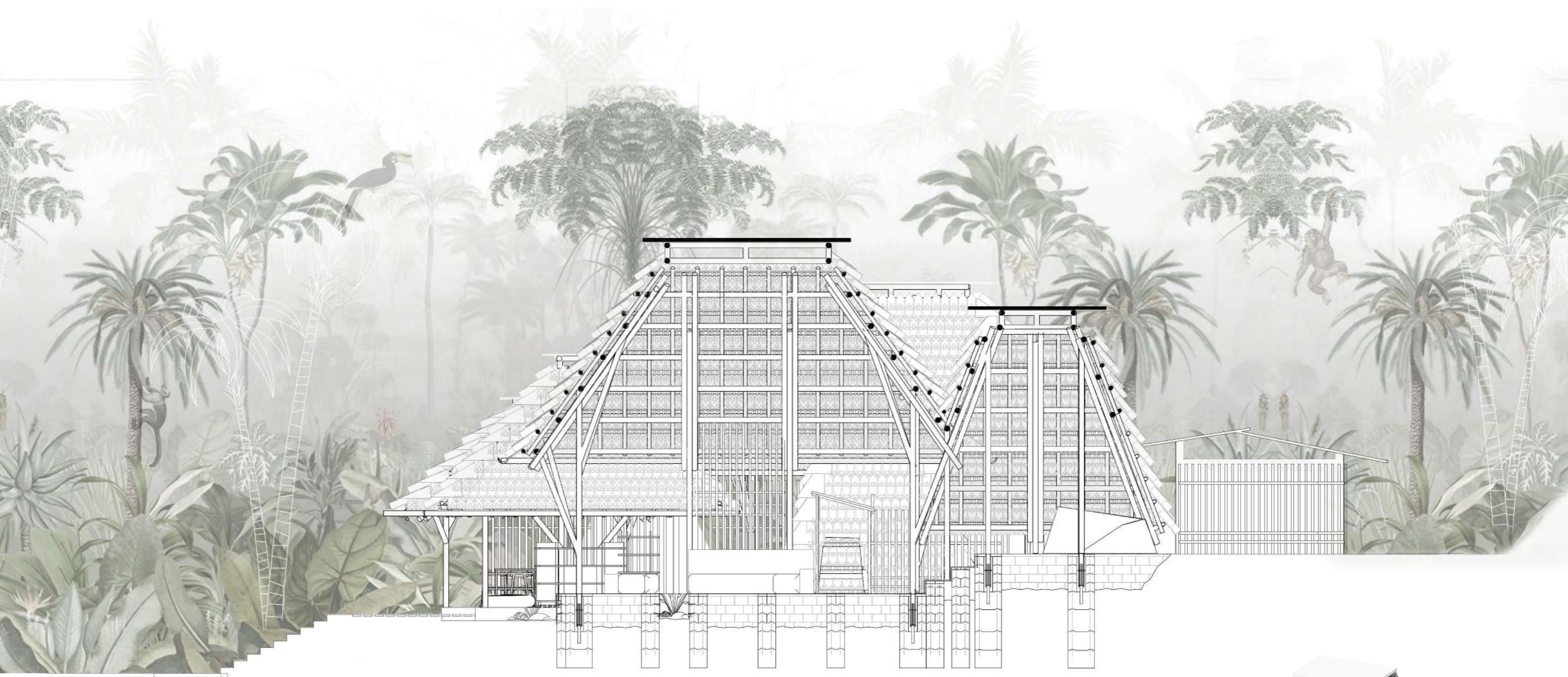


- 1. Entry area
- 2. Living room
- 3. Rest area
- 4. Portal
- 5. Kitchen and Dining + Workshops area
- 6. Storage
- 7. Meat preparation
- 8. Waste & compost
- 9. Herb garden

VIEW FROM THE ENTRANCE



PAVILION SECTION AA



VIEW FROM SEATING AREA



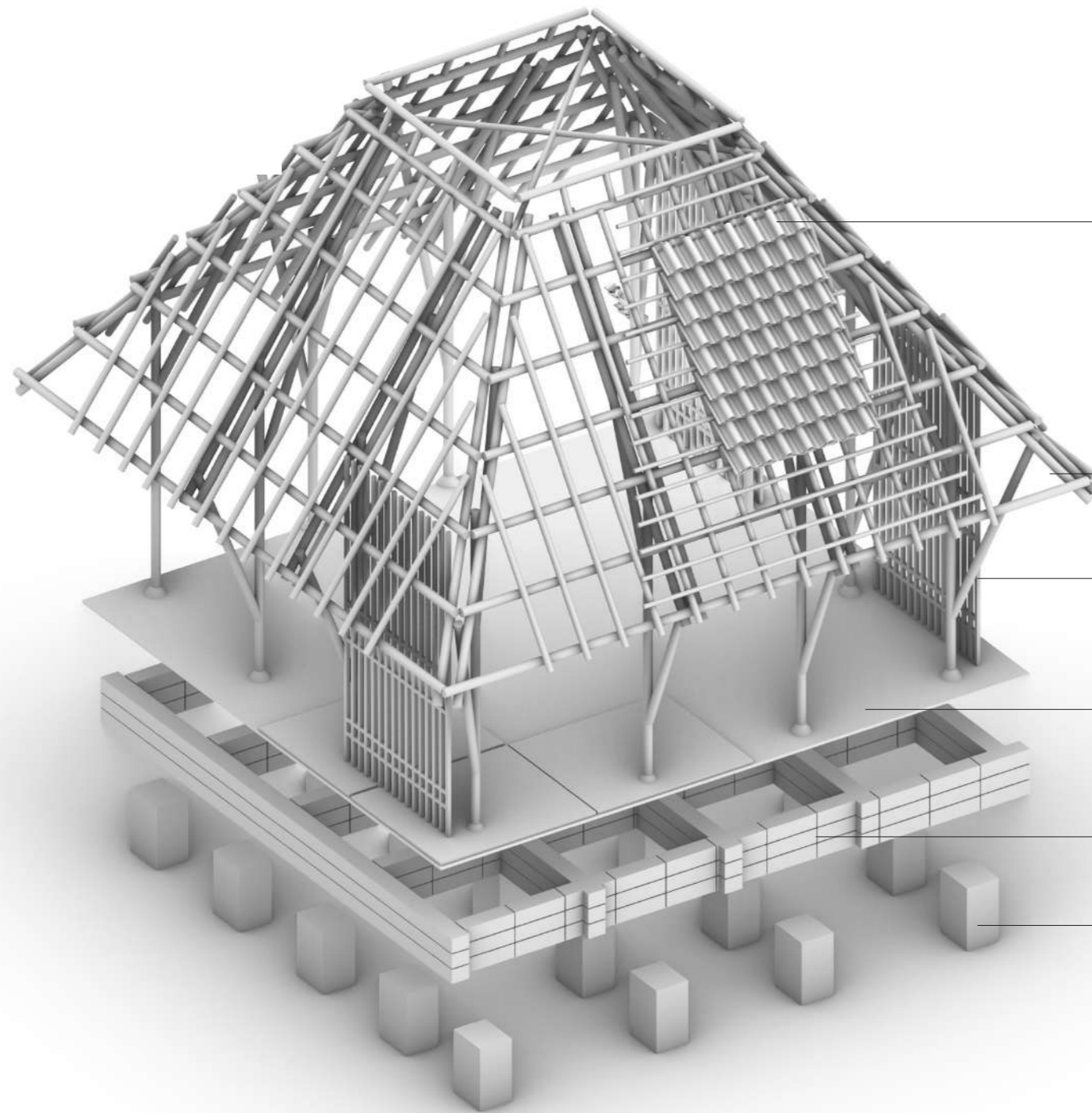
PAVILION SECTION BB



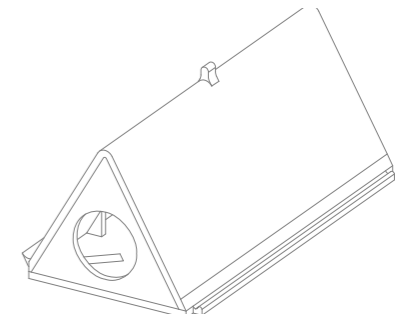
VIEW OF DINING SPACE



CONSTRUCTION



Plastic roof tile (bespoke)



Bamboo structure



Partition walls - extrusion molded plastic lumber

Pressed plastic sheets finish



Compressed blocks plinth

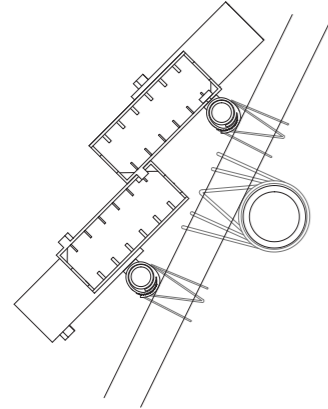
Plastic block foundations



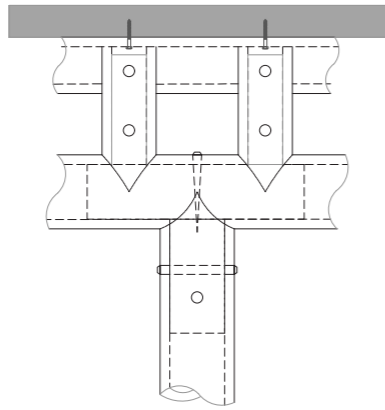
Palm wood furniture



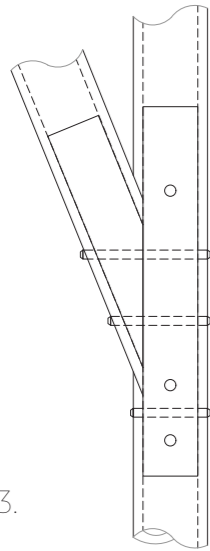
DETAILS EXPLAINED



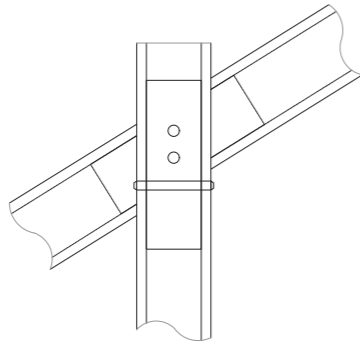
1.



2.



3.



4.

Bamboo connections

- 1. Roof tile element to bamboo:
 - Hanging of the tile
 - Lashing (tying) of bamboo battens
- 2. Bamboo beam to roof top cover
- 3 & 4. Bamboo to bamboo:
 - wood cylinder reinforcement
 - bamboo dowels

Column to foundation

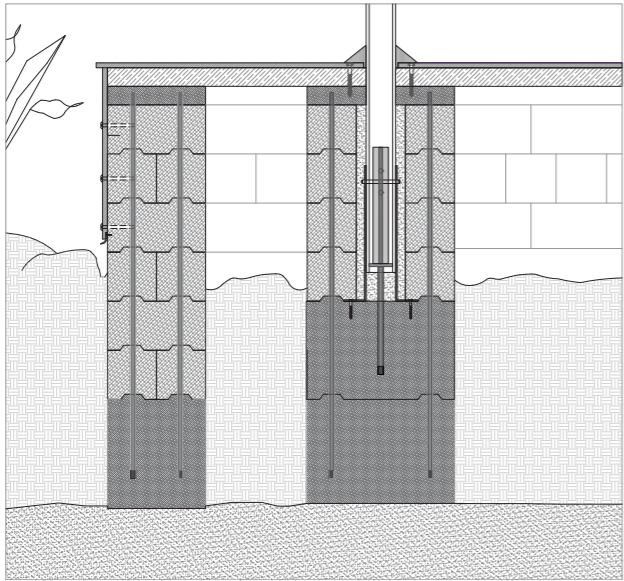
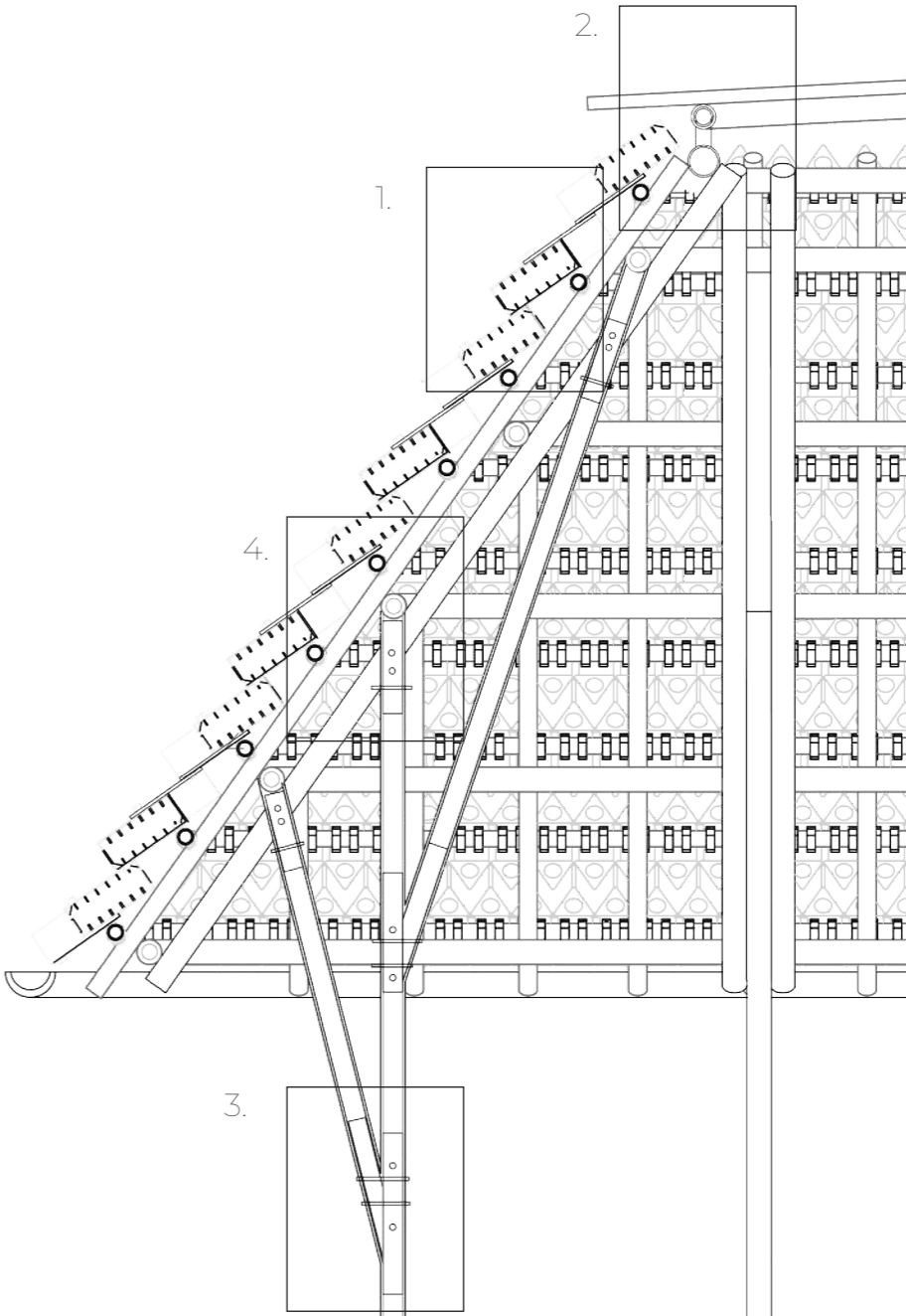
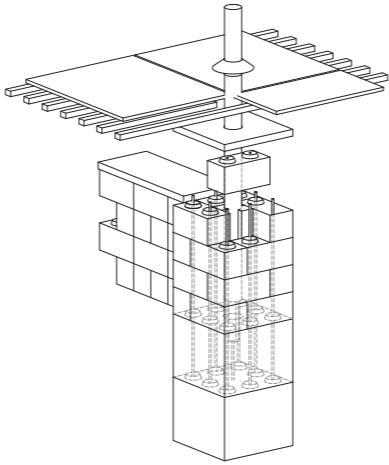
- Bamboo pile
- Plastic footing element
- Concrete filling
- Steel reinforcement
- Sand filling
- 1-2cm cement mortar

Floor and plinth

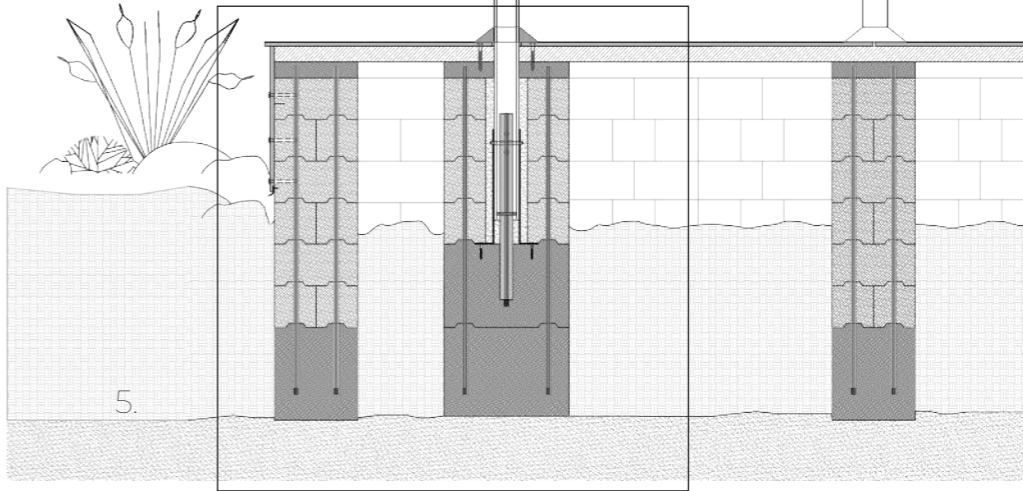
- Recycled plastic pressed sheets
- Compressed plastic blocks
- Steel screws, waterproof cap

Base layers

- Waterproof membrane
- Compressed sand
- Gravel
- Soil

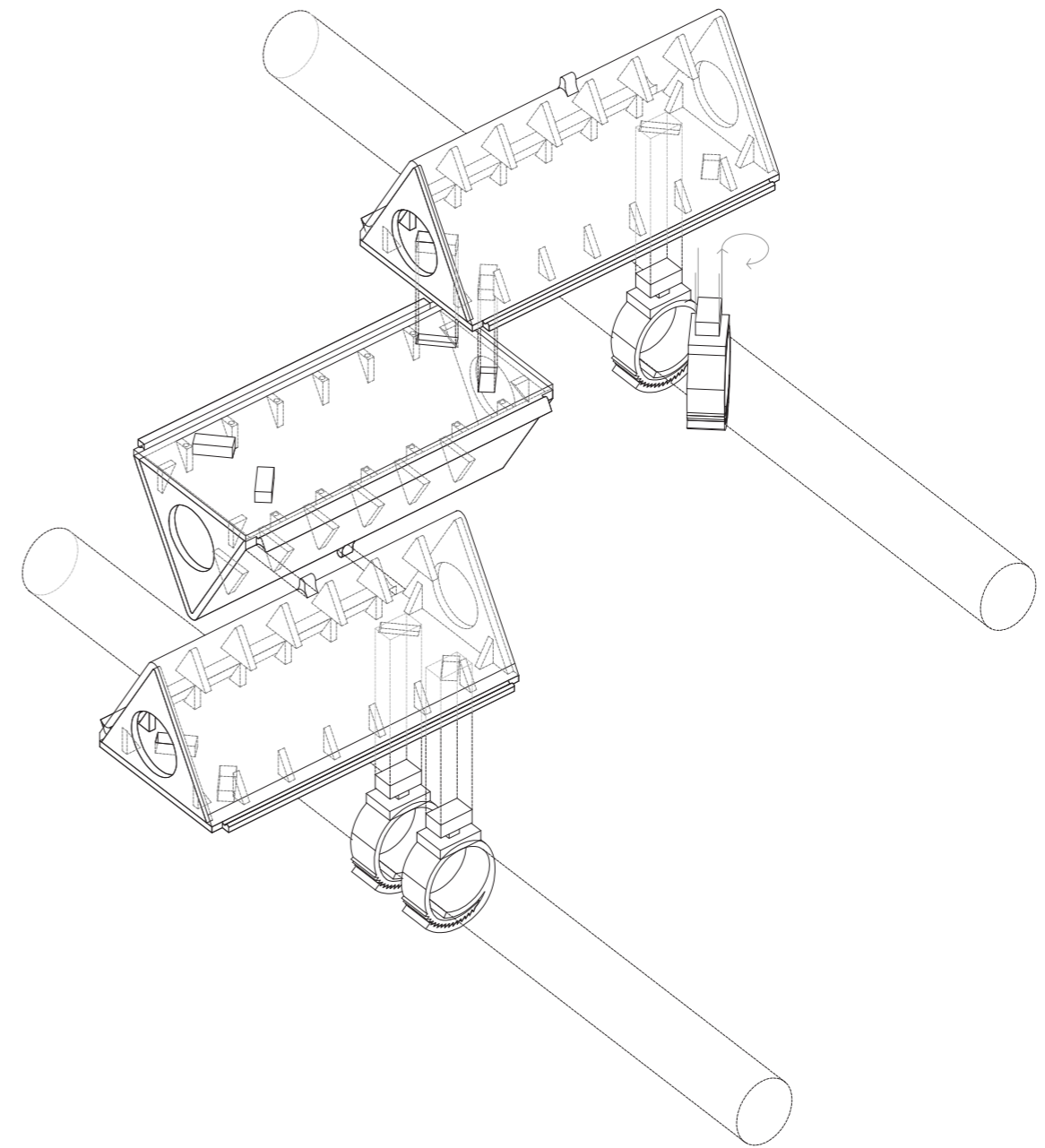
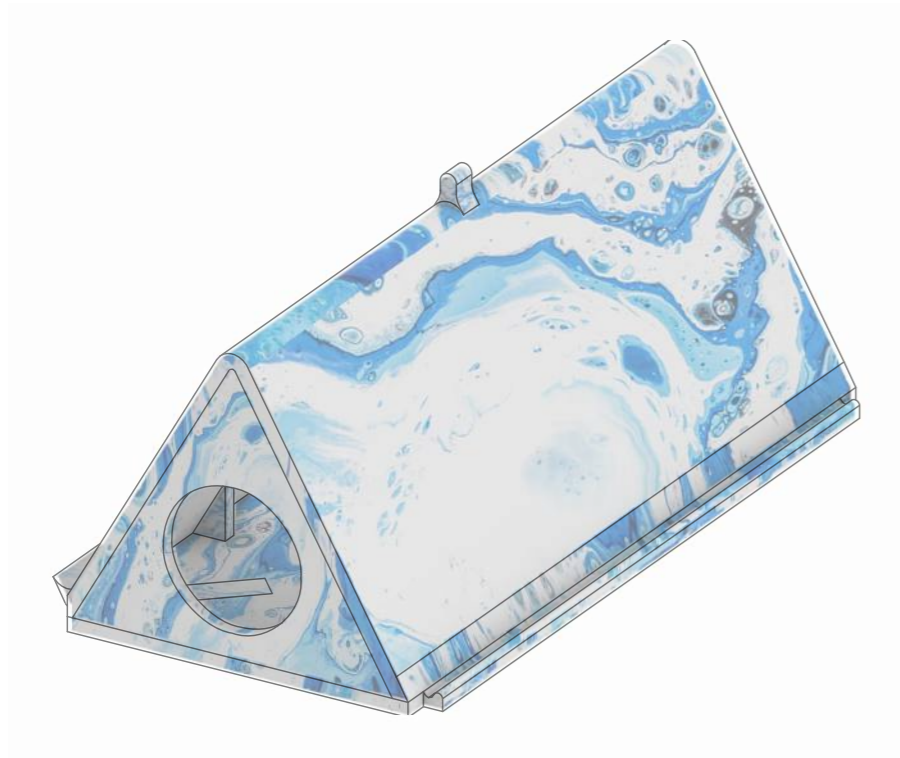


5.

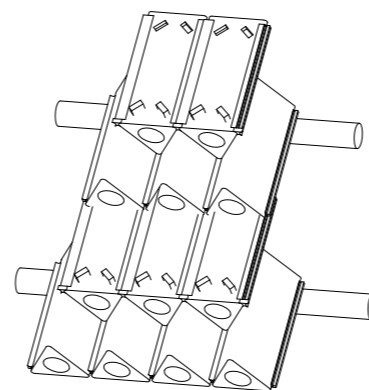


5.

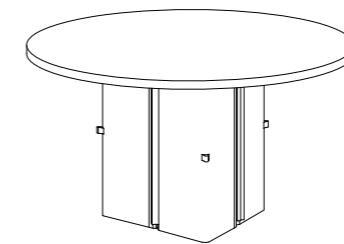
ROOF ELEMENT EXPLAINED: FUNCTION



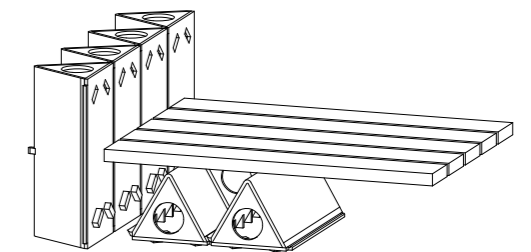
-  Sun light in
-  Rain protection
-  Biophilic function
-  Educational
-  Durable
-  Lightweight
-  Stackable



Roof tile

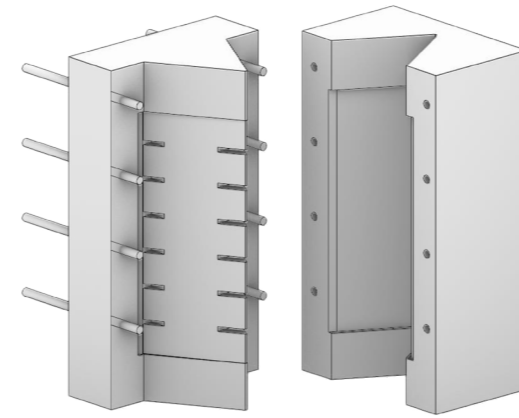
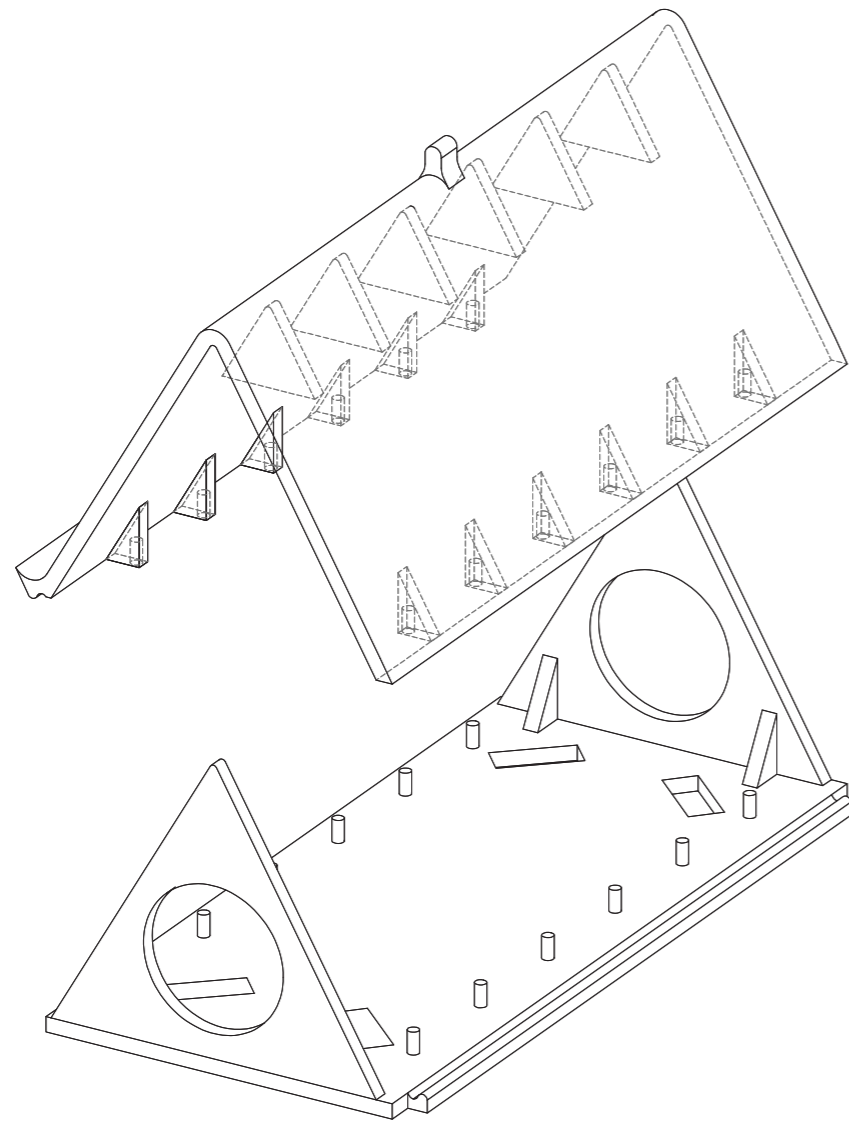


Furniture

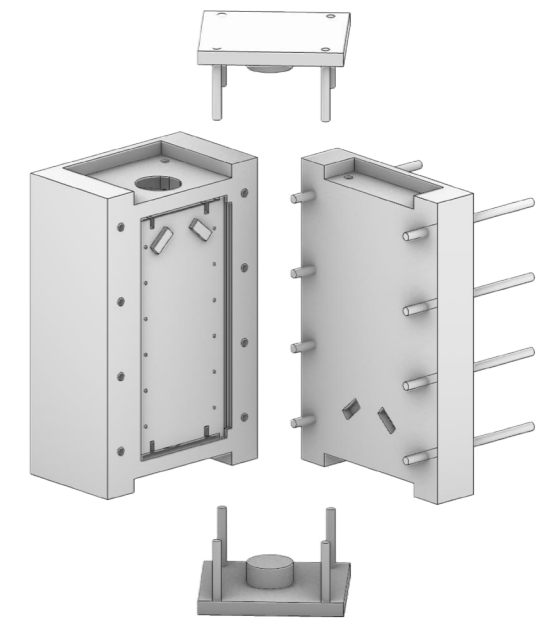


Structural support

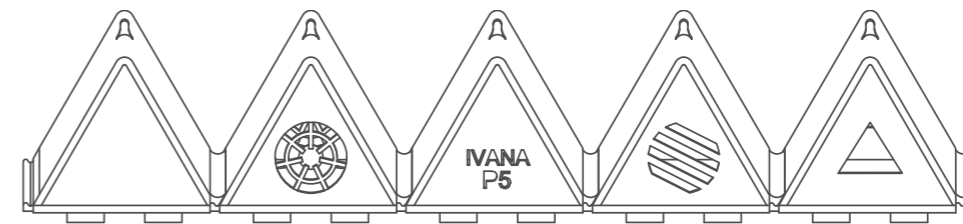
ROOF ELEMENT EXPLAINED: MAKING

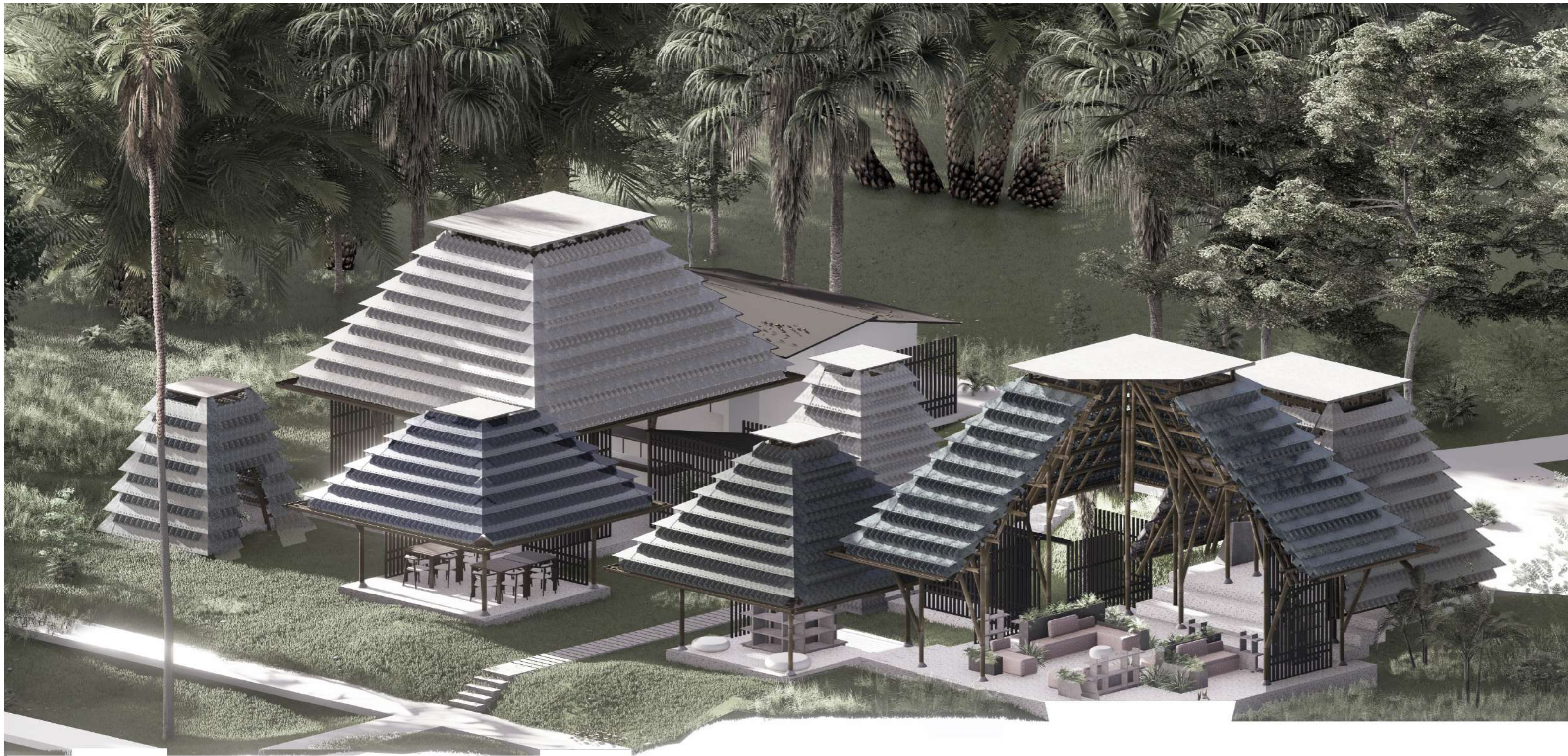


Mould top part



Mould bottom part





Thank you!

