



GROW BUILD

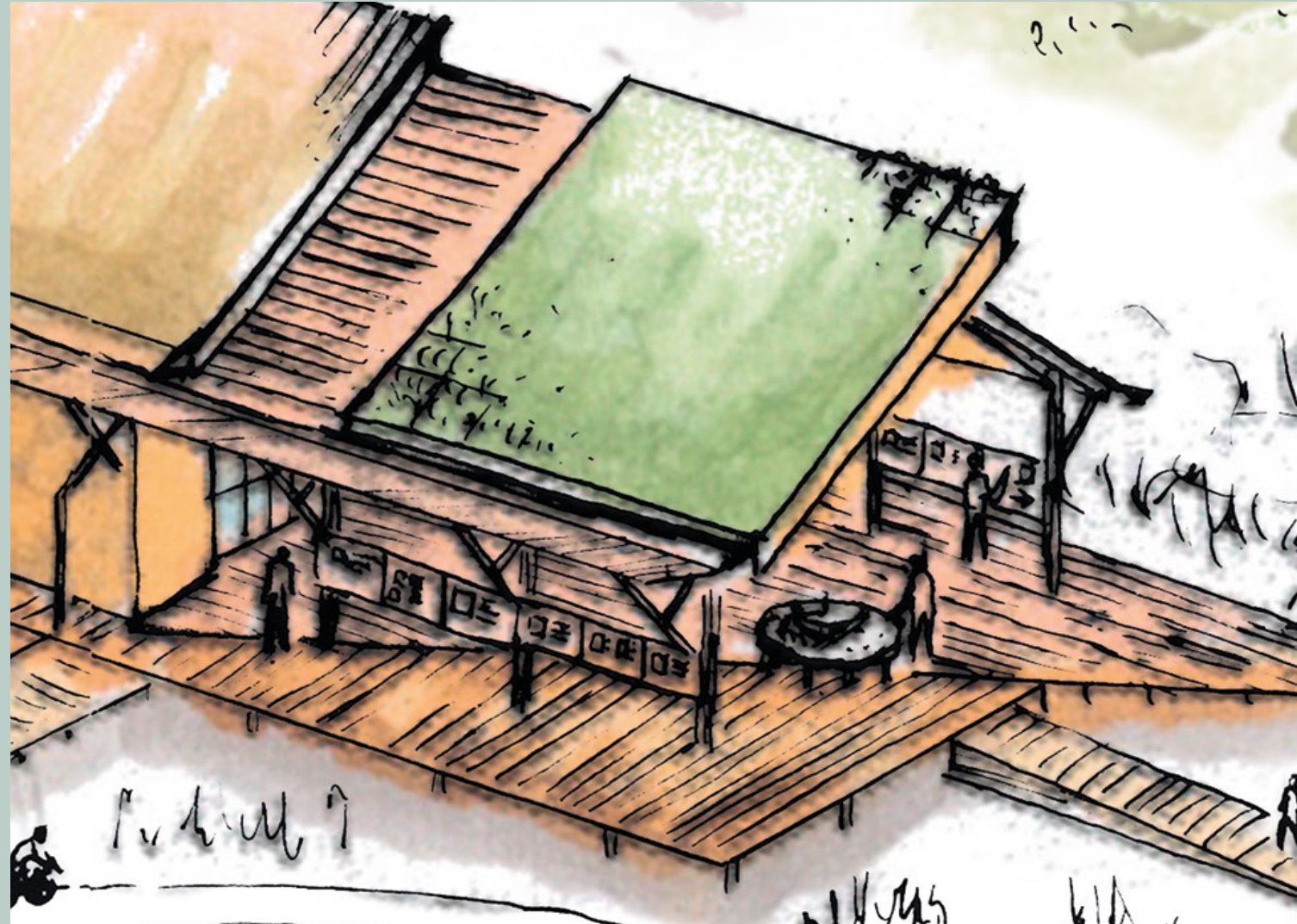
Luka Brandsma
P5 Architectural
Engineering

tutoring:
Yannick Warmerdam
Mo Smit
Paddy Tomesen



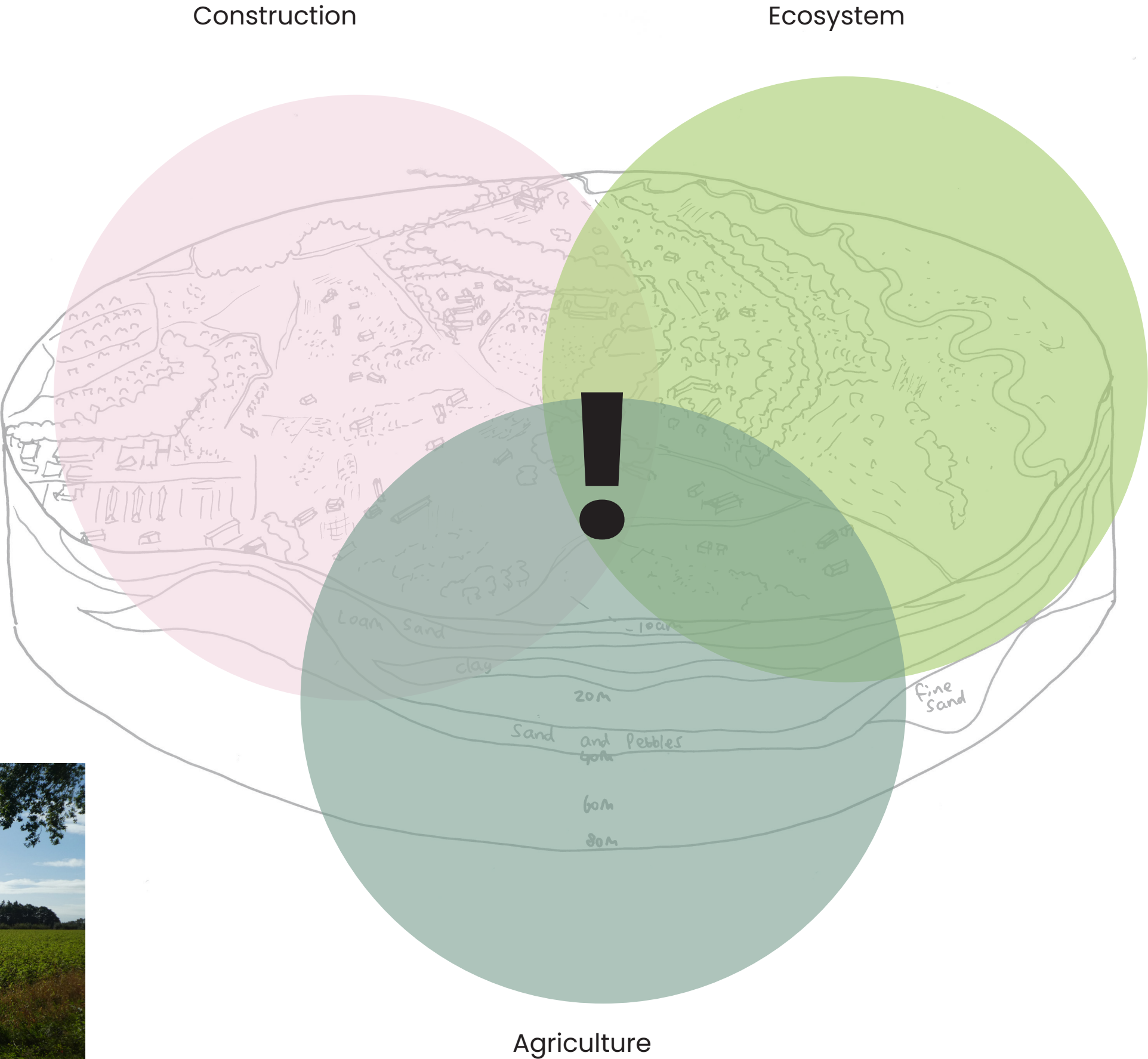


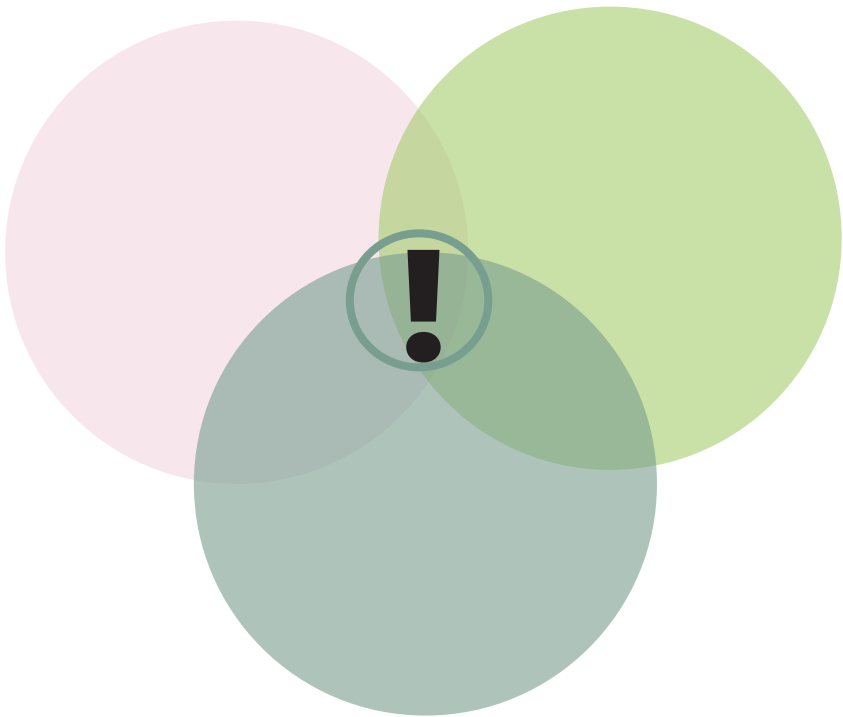




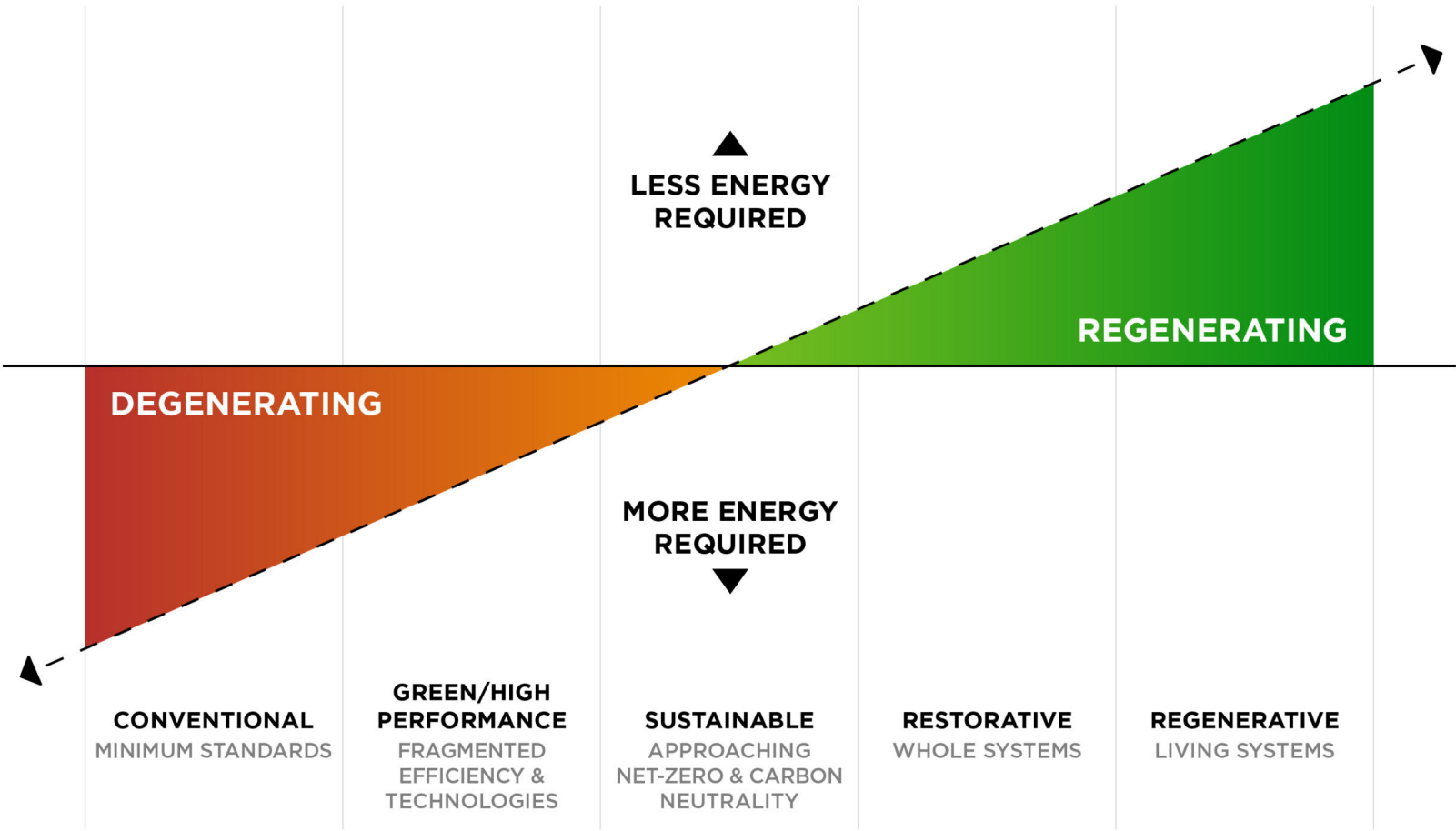
PROBLEM

problem





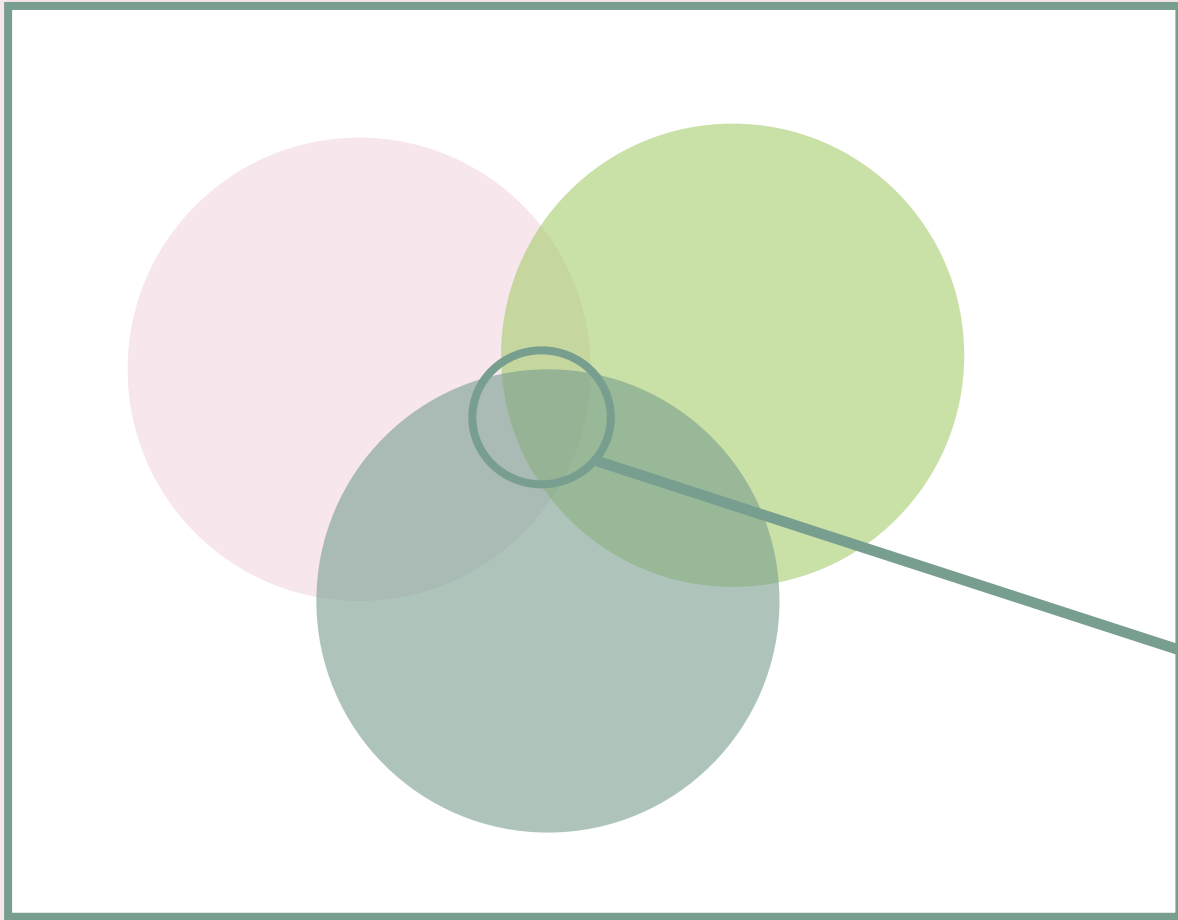
“There is a need to move beyond sustainability towards a regenerative paradigm”*



reprinted from Henderson Engineers, 2021

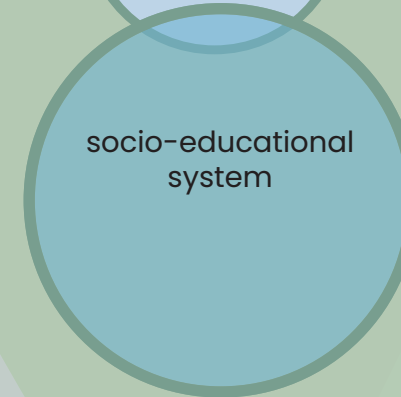
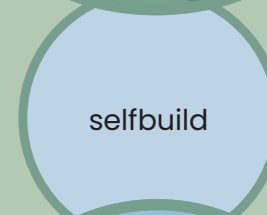
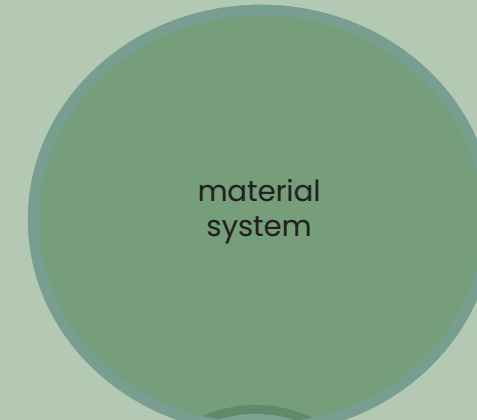
“A shift from a mechanistic to an ecological worldview” **

* Du Plessis, 2012; Mang & Reed, 2012
 ** Konietzko et al, 2023)



Construction

Ecosystem



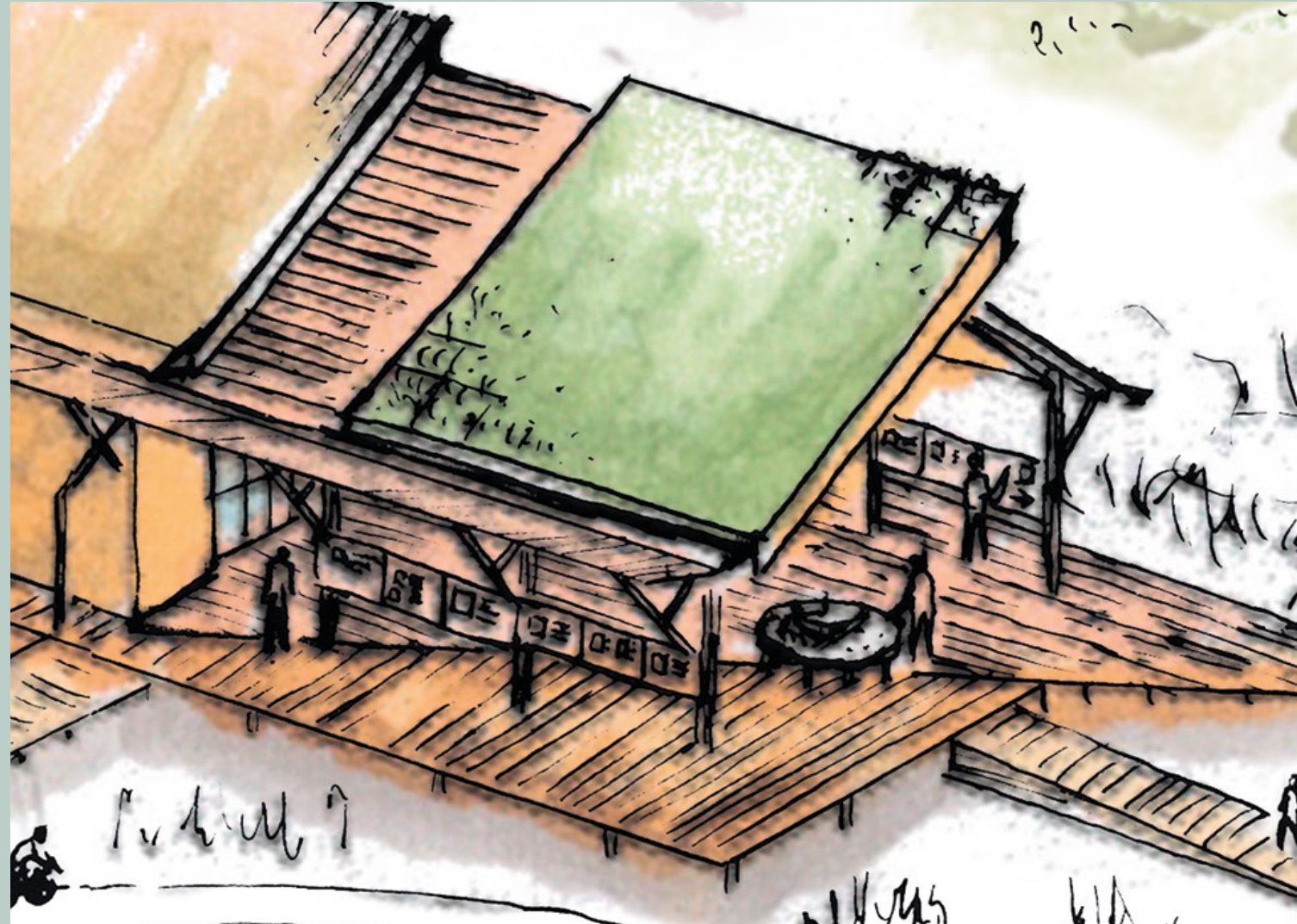
Agriculture



- part of collective (CPO)
- self-build start to finish
- open for alternative living

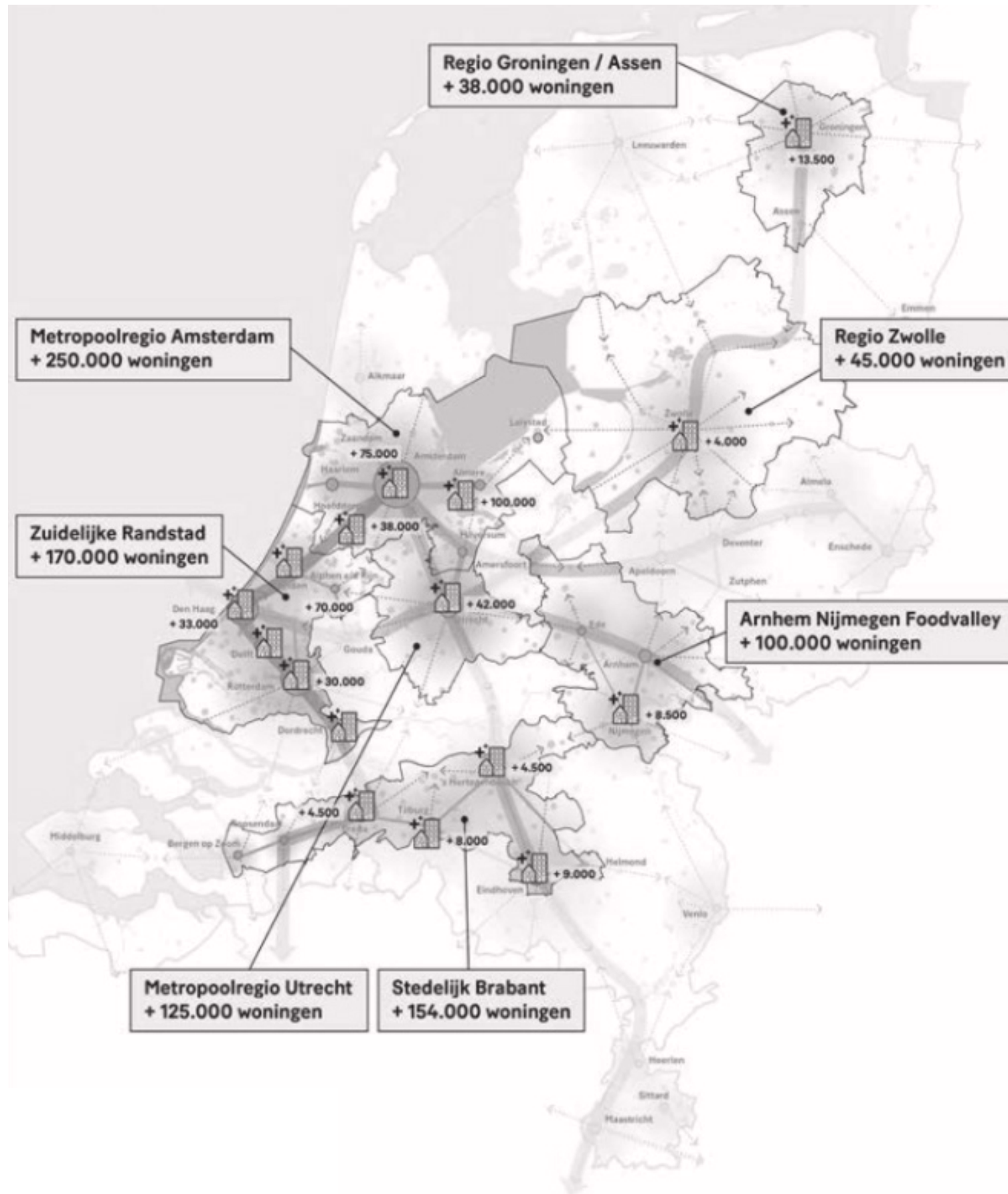
“self-builders are private individuals or groups of private individuals (CPO*, VVE) that build, or commission, housing.

// **



RESEARCH APPROACH

context

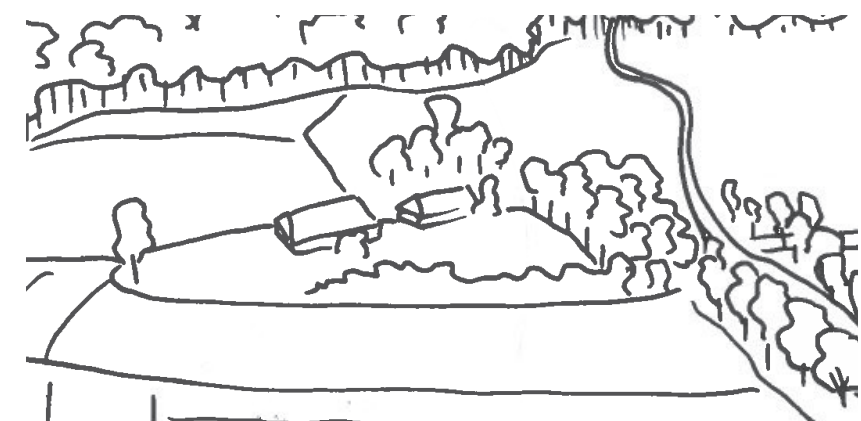


* Reprinted from: Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2021)

- urbanisation plans
- interest self-building
- support regenerative farming
- small contractors
- diverse landscape
- rich history vernacular farms



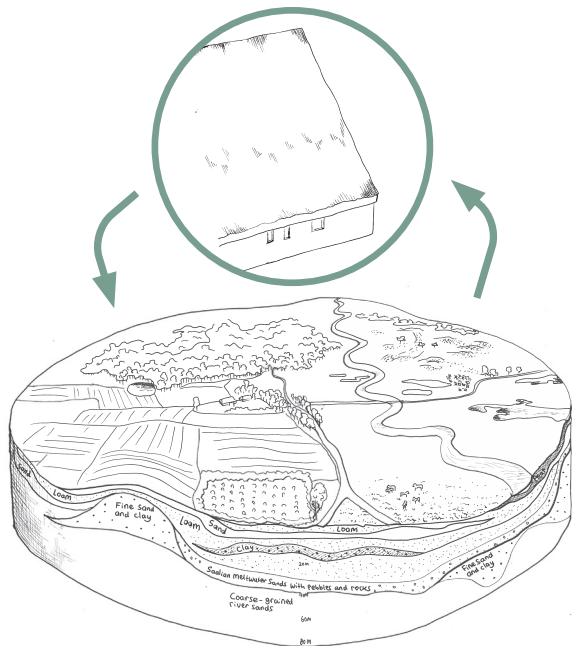
“If we can’t buy a house, we will build it ourselves”



Esdorp [domed land]

How can we **translate** the **relationship** of **vernacular architecture** in **Drenthe** with its **landscape** to applicable knowledge for **regenerative self-building** in the modern context?

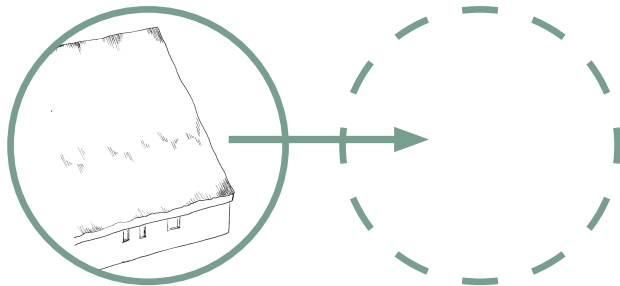
HALLENHUIS
&
LANDSCAPE



hallenhuys & landscape

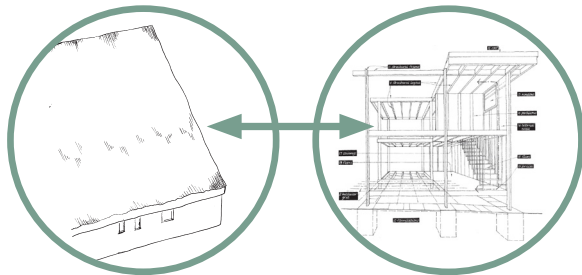


IMPLEMENTATION



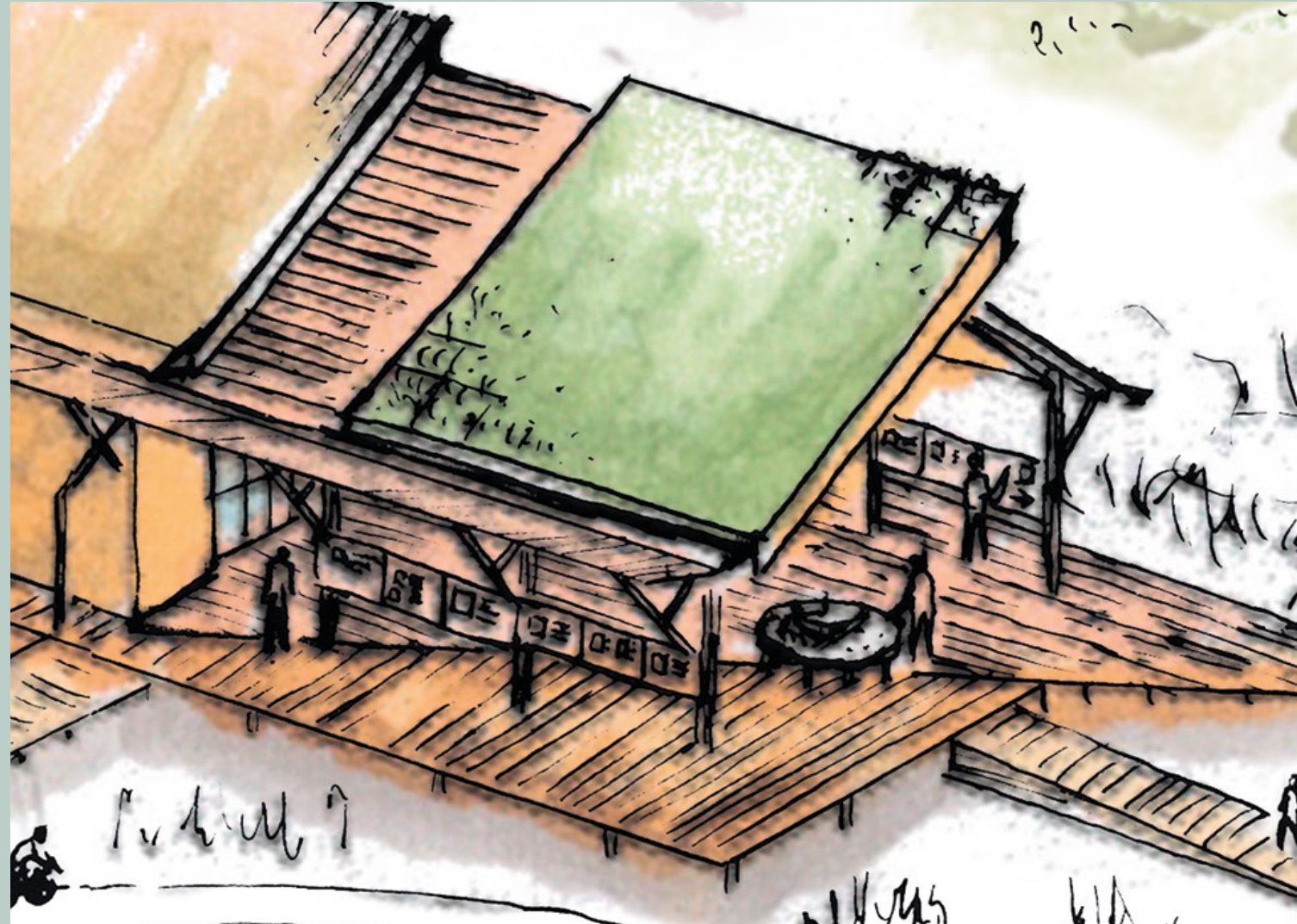
hallenhuys

APPLICATION



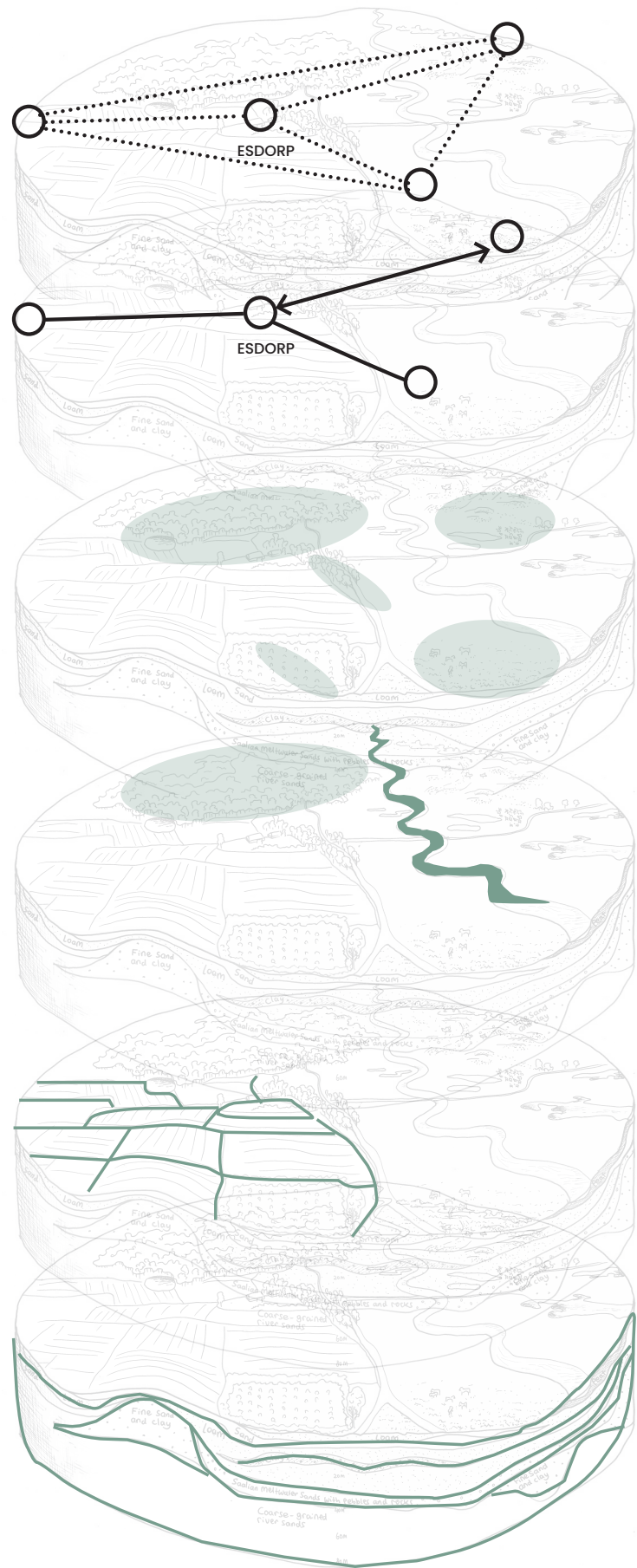
hallenhuys

Segal



RESEARCH RESULTS

research results



layering of the landscape

SOCIOEDUCATIONAL: SOCIAL,
COMMUNITY ENGAGEMENT,
OWNERSHIP

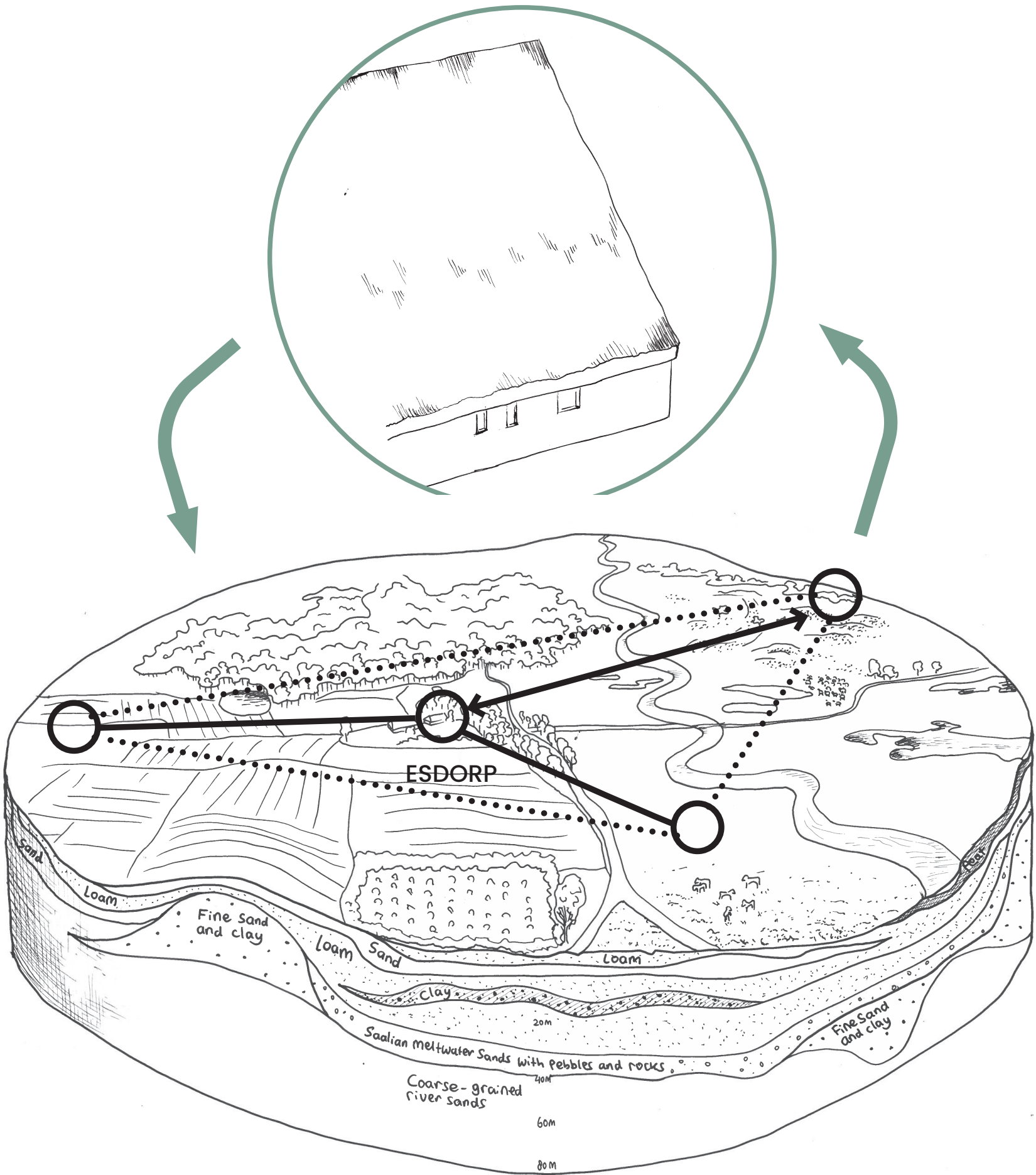
ECONOMIC MODEL

VEGETATION

ECOSYSTEM SERVICES

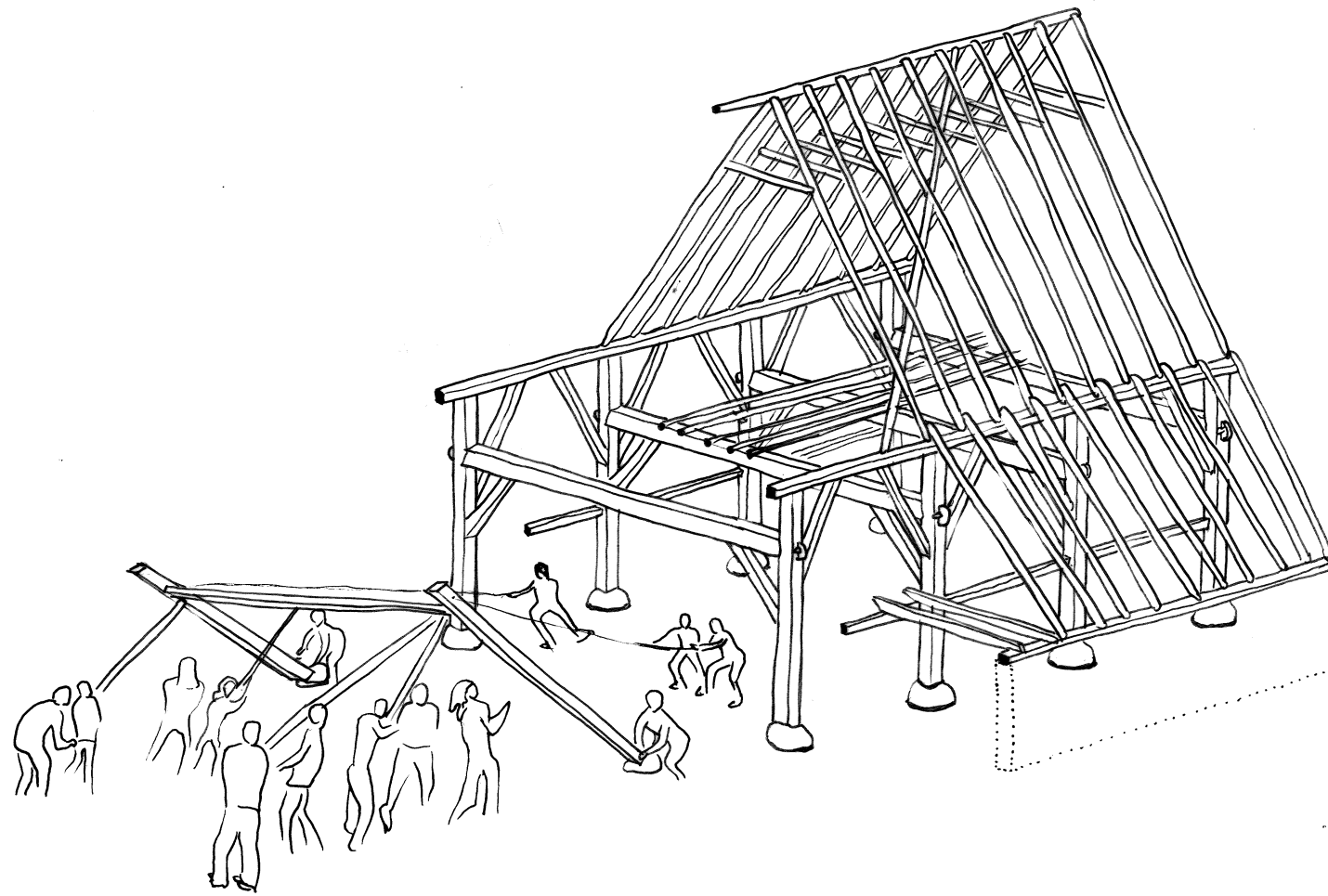
CULTURAL INTERVENTION

ABIOTIC CONDITION

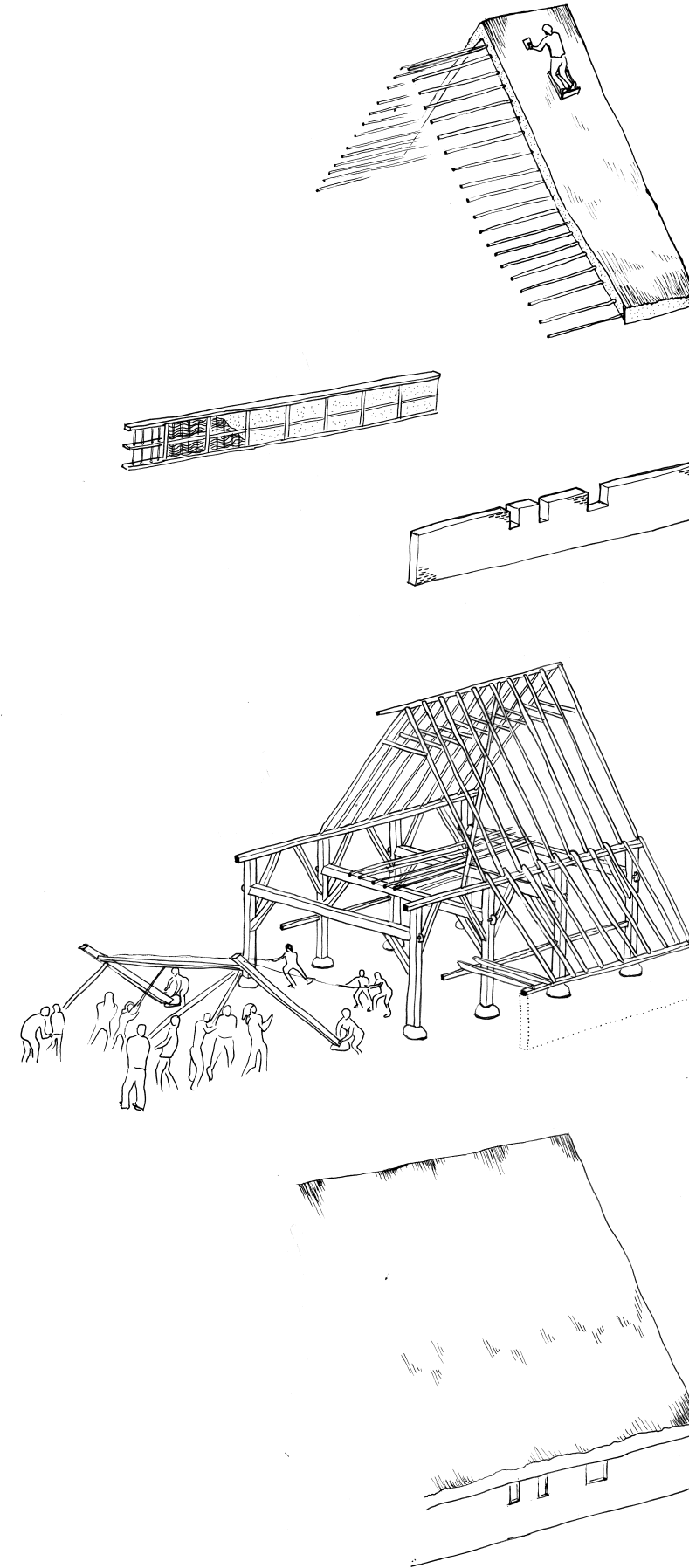


role of the farm

research results

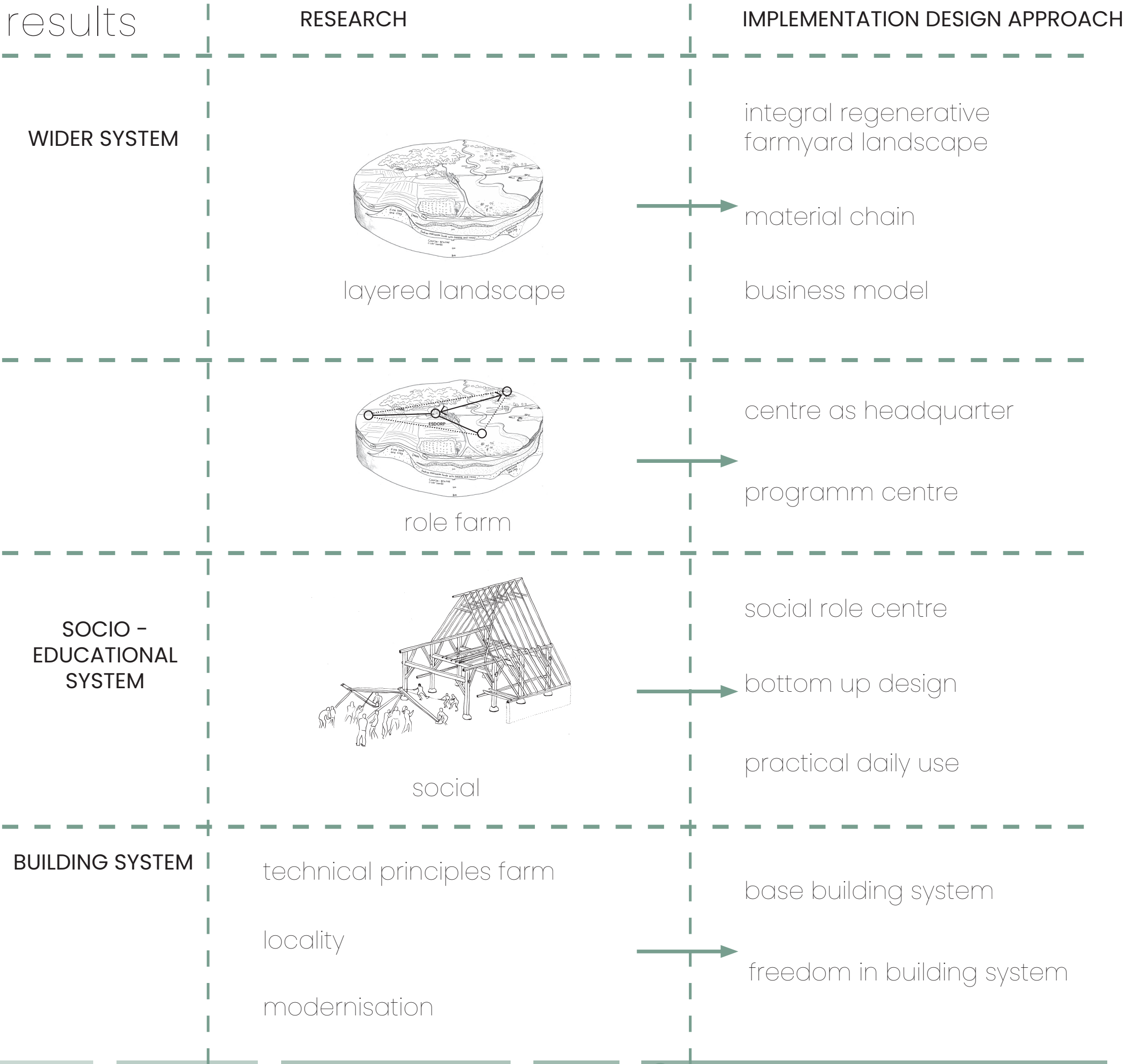


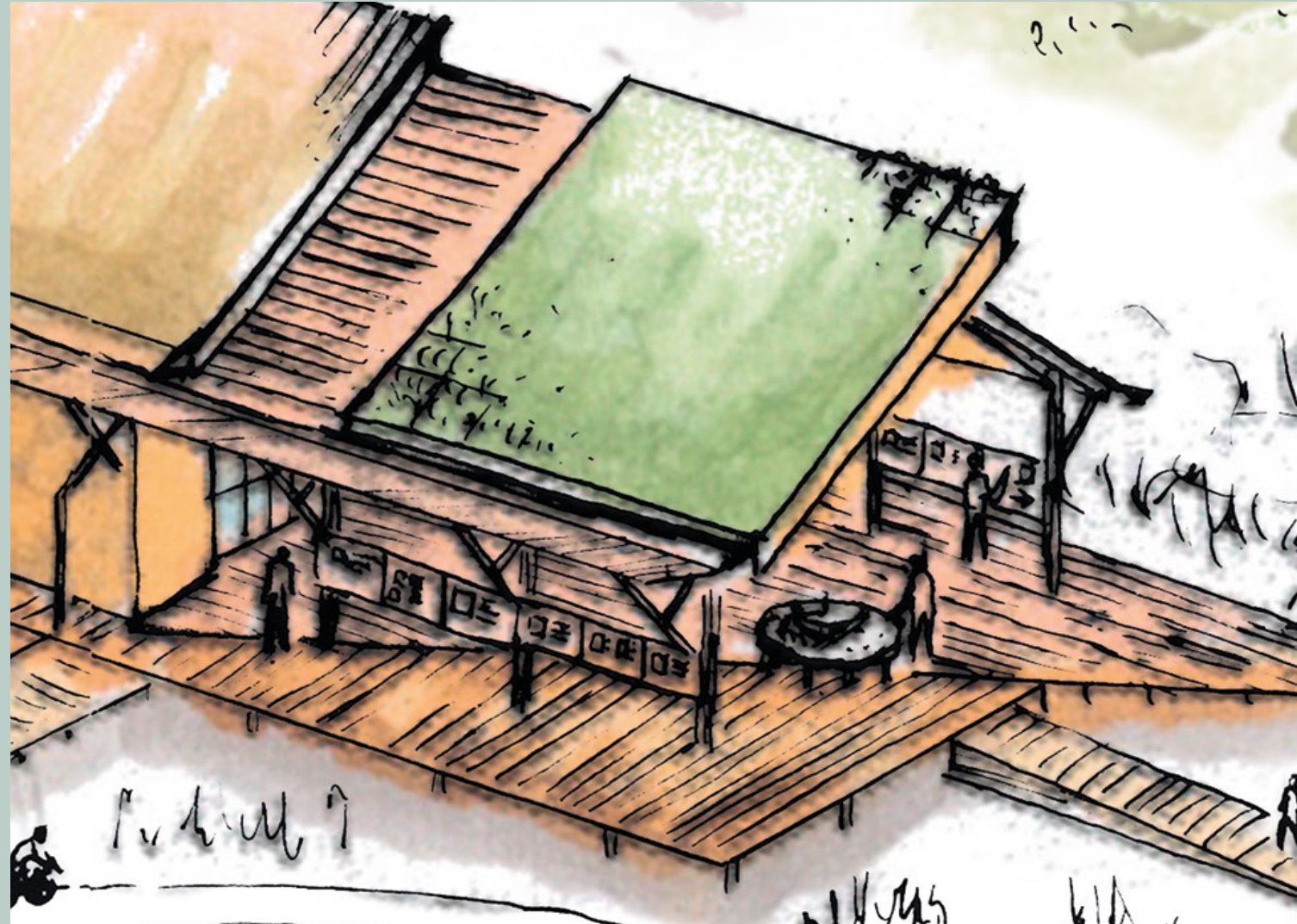
construction as a collective problem



technical principles

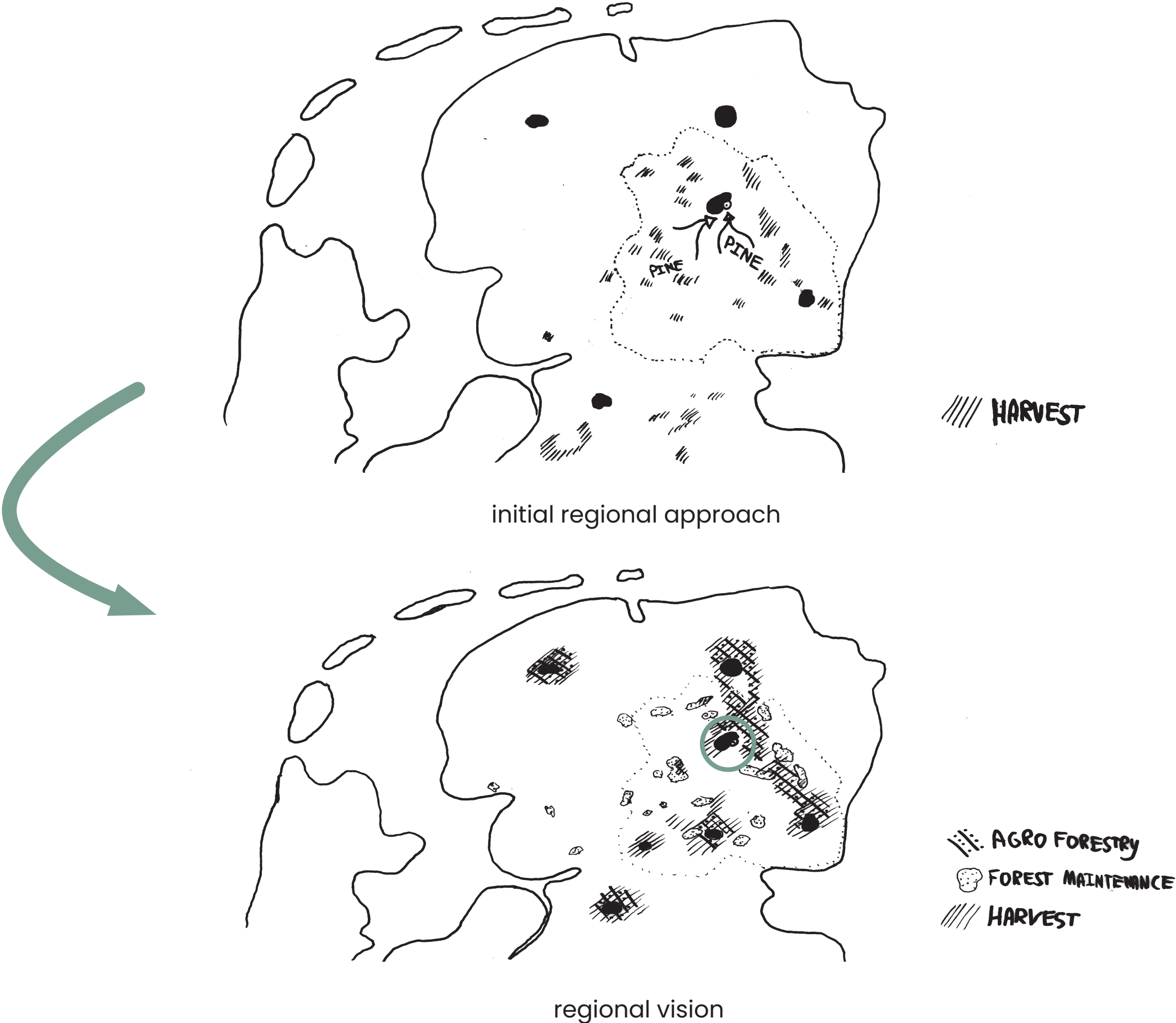
- availability raw materials
- factor of time
- sharing skills and craftsmanship
- practical reuse & separation



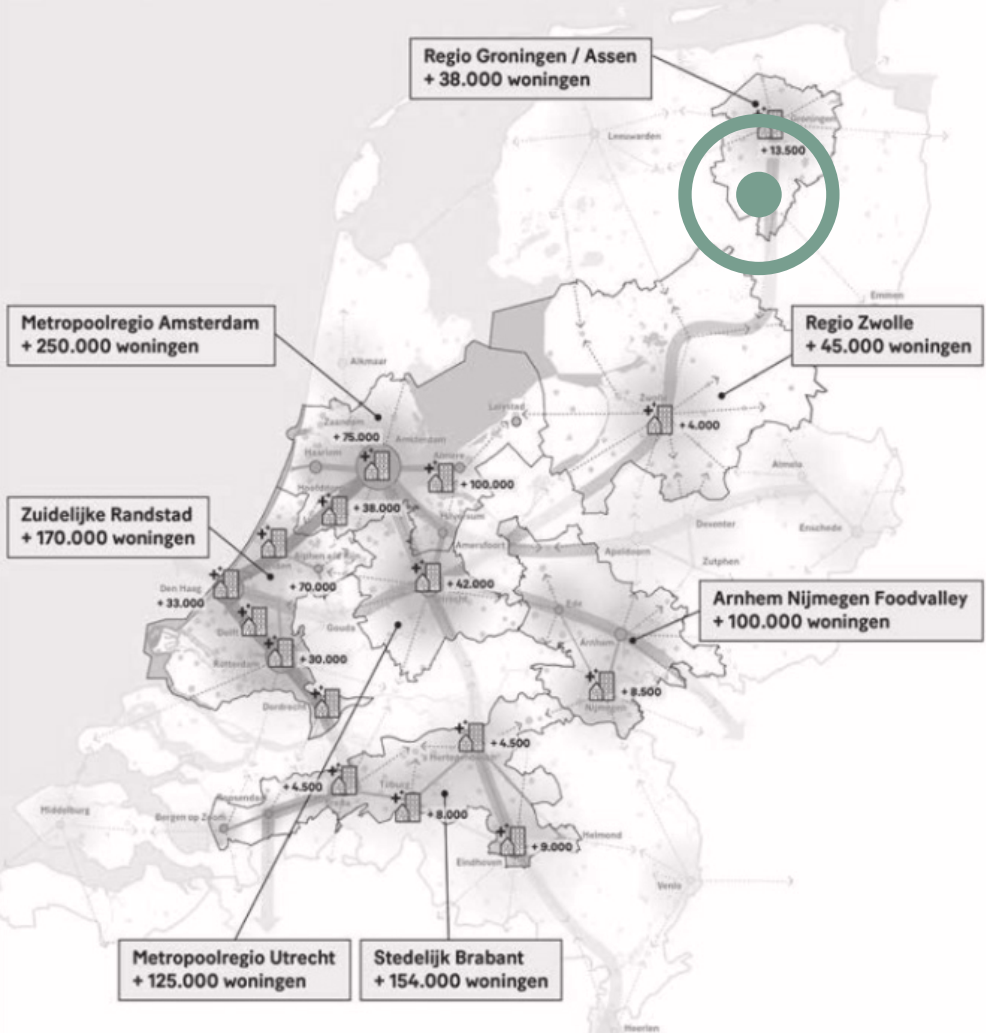


DESIGN CONCEPT

regional vision

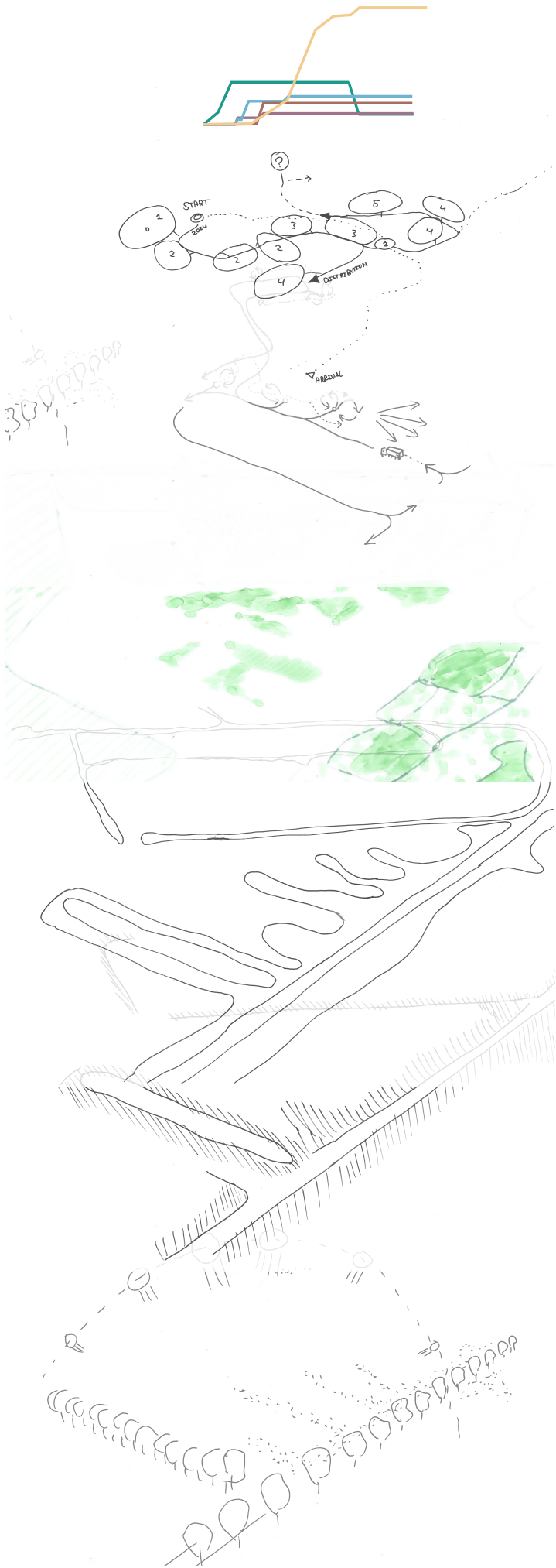
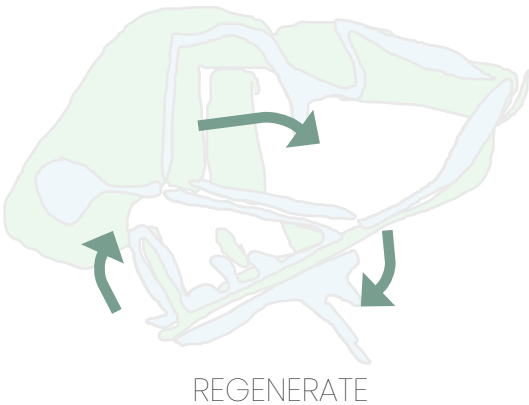
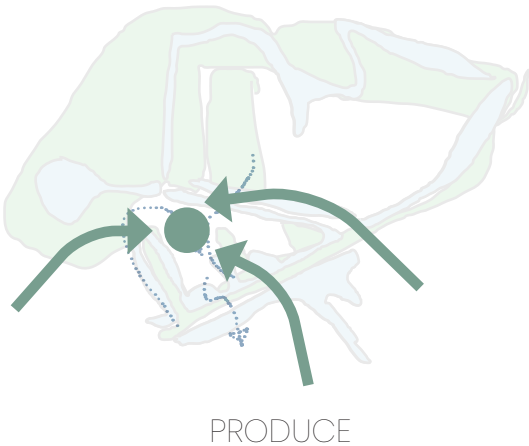
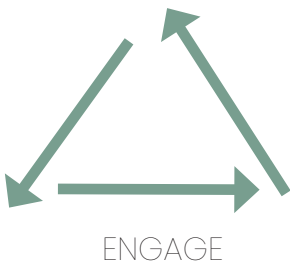


location



current location

site concept



SOCIOEDUCATIONAL: SOCIAL,
COMMUNITY ENGAGEMENT,
OWNERSHIP

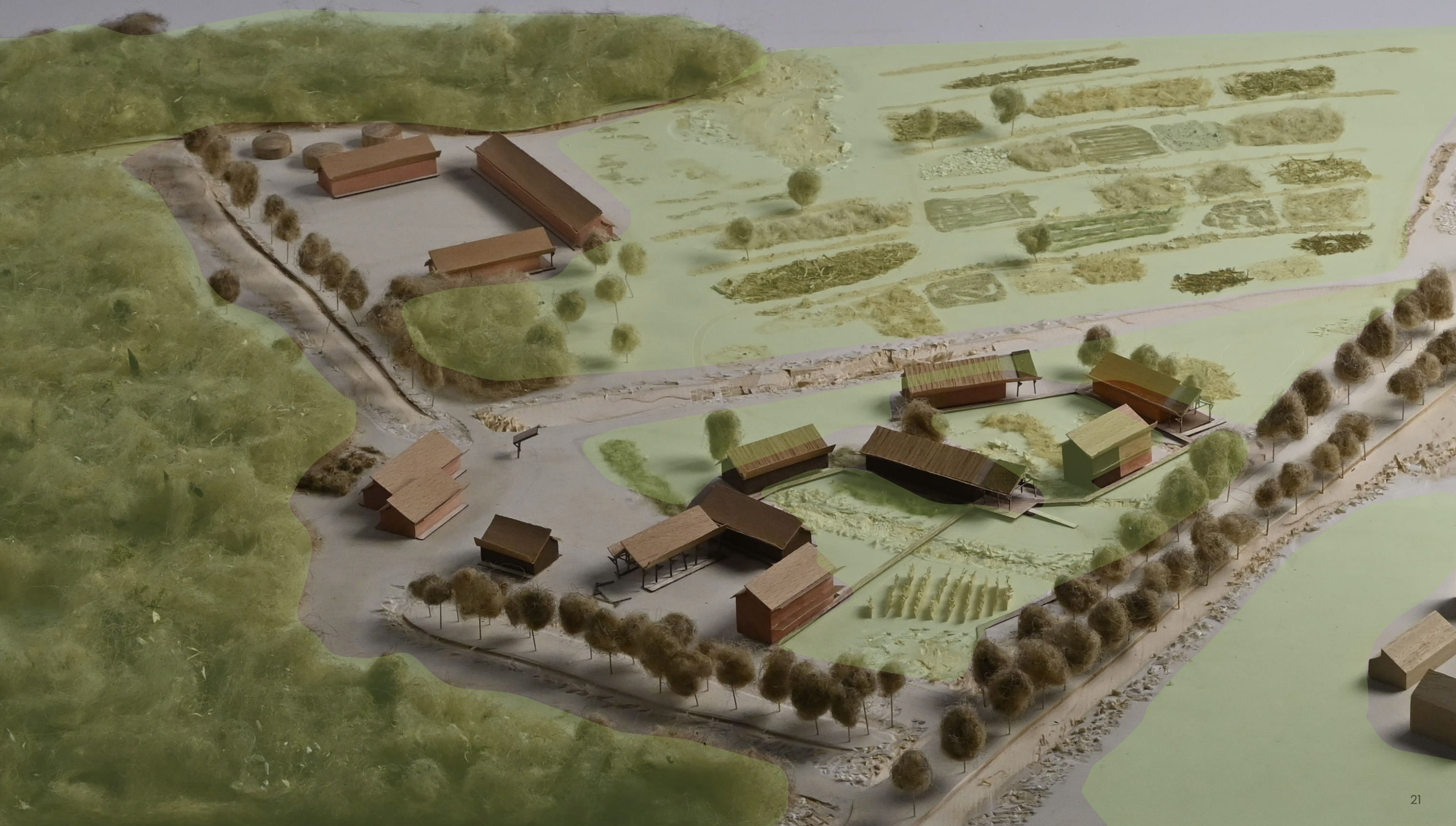
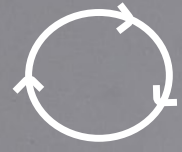
ECONOMIC MODEL

VEGETATION

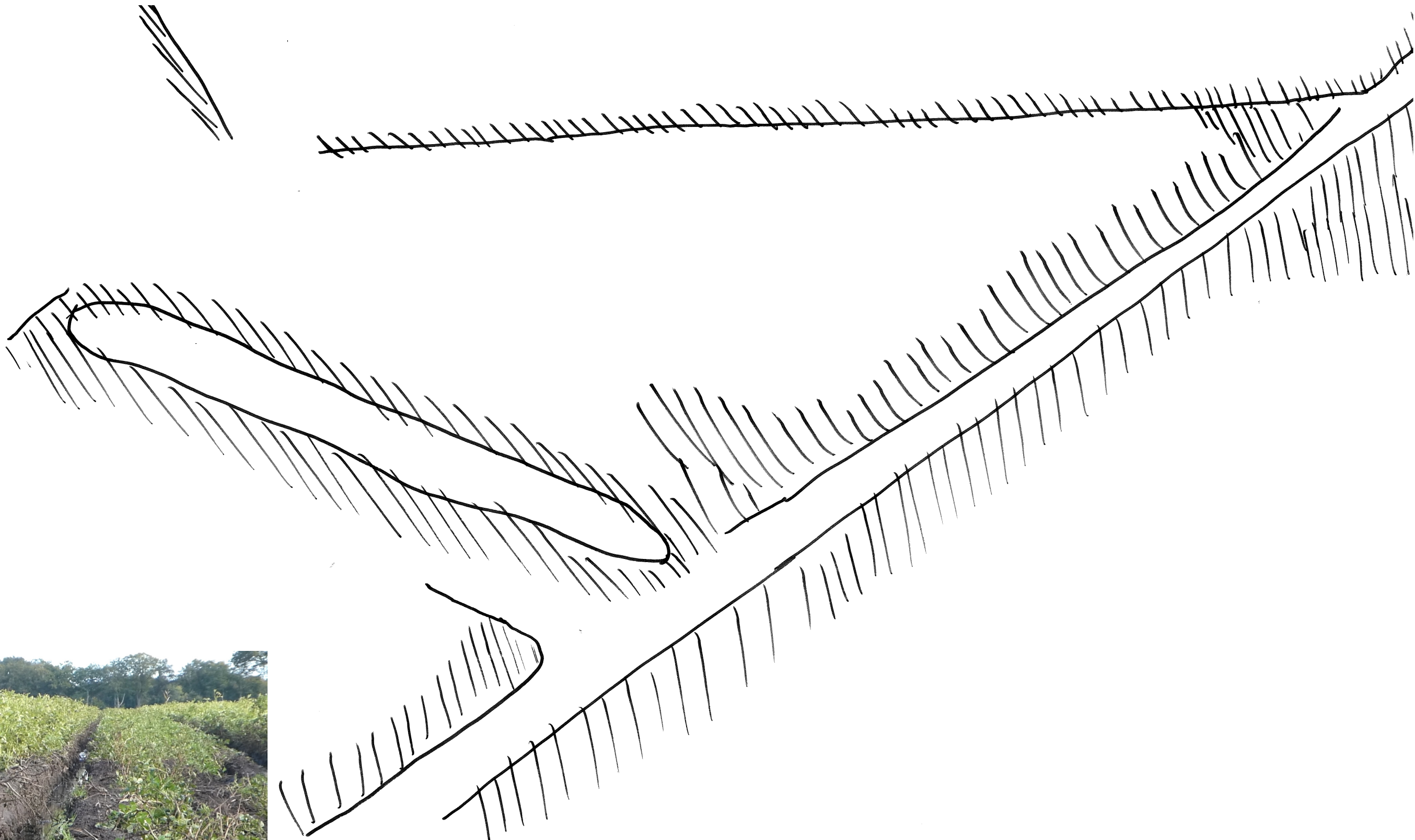
ECOSYSTEM SERVICES

CULTURAL INTERVENTION

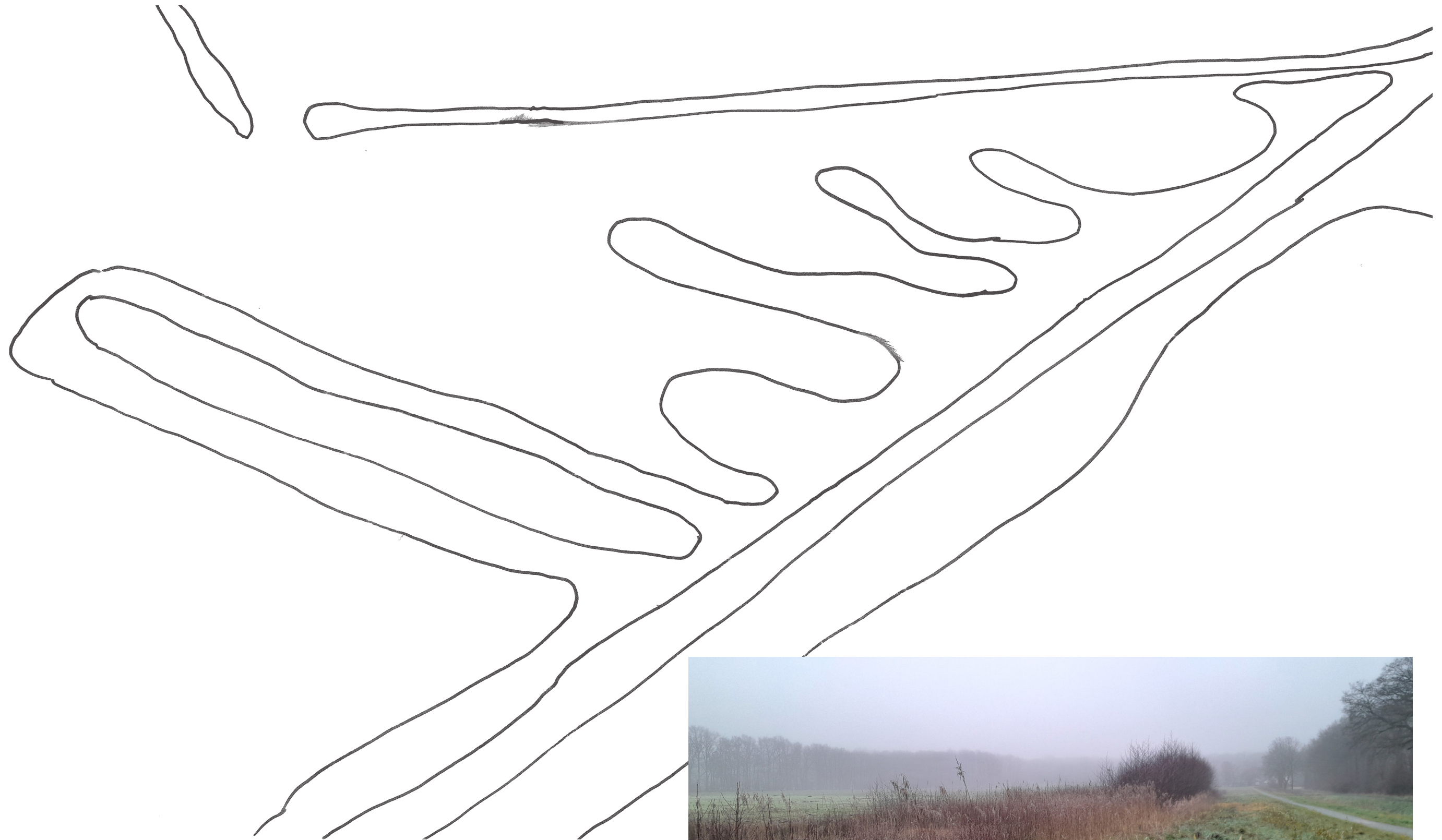
ABIOTIC CONDITION

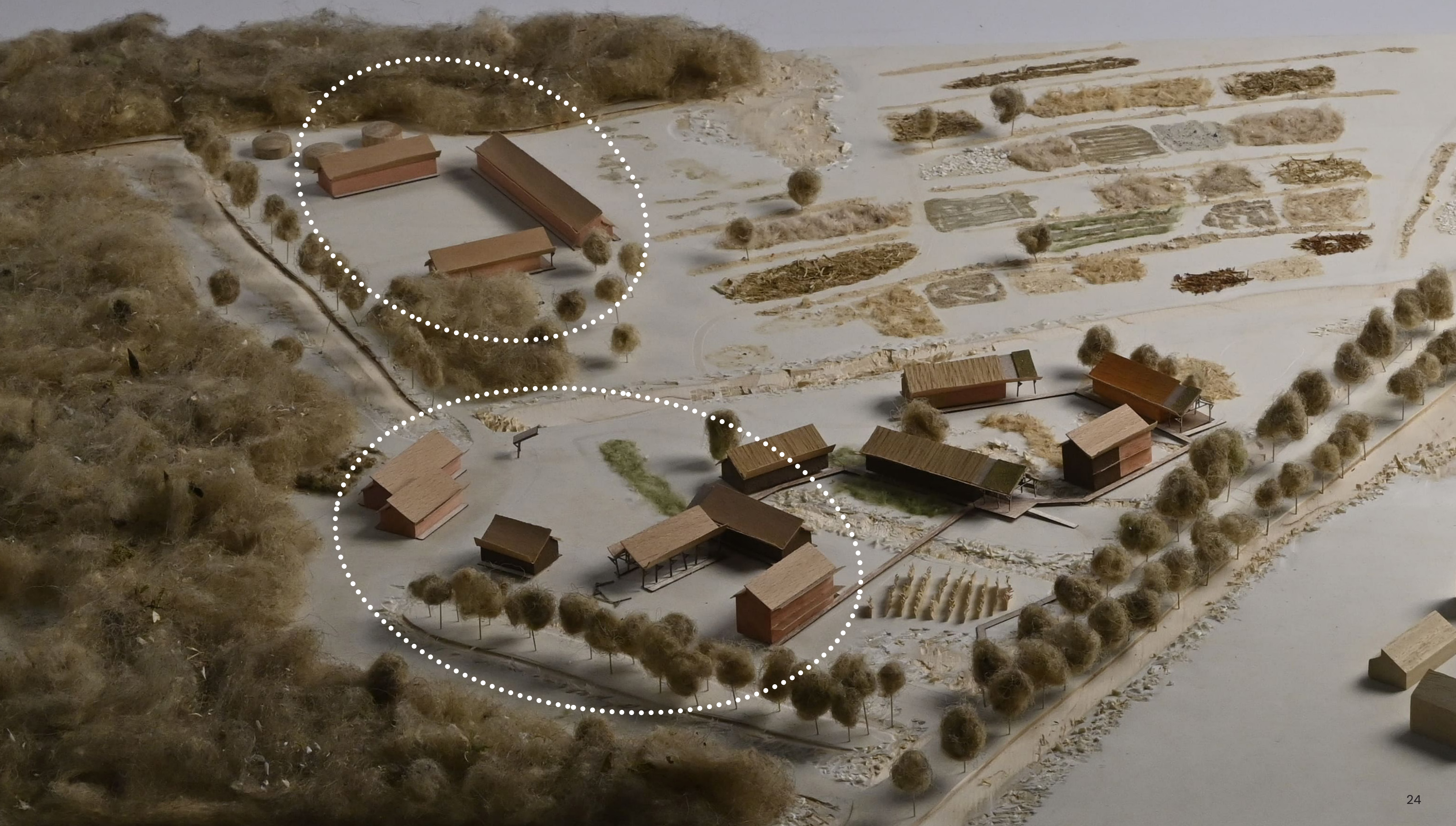


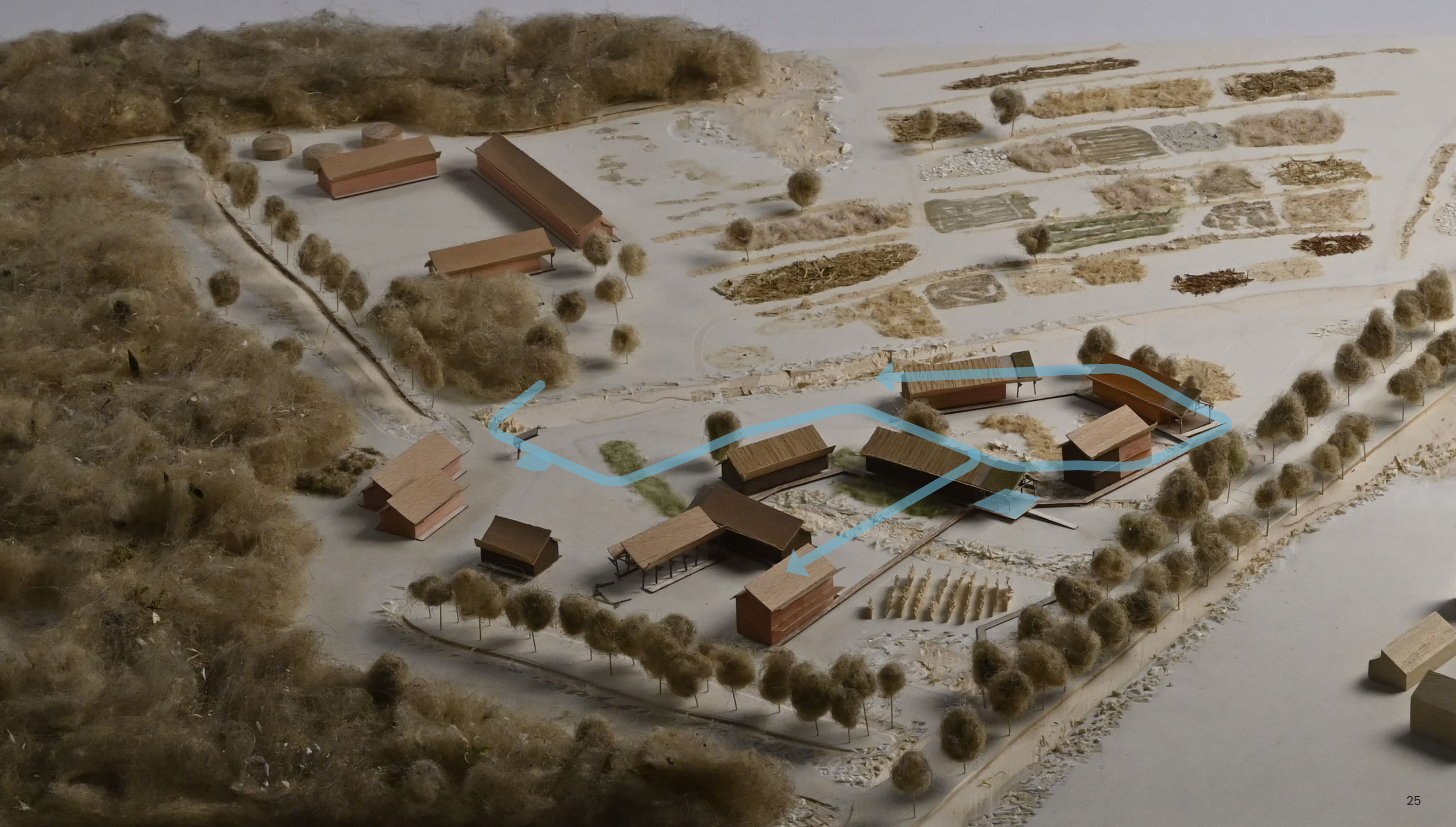
site concept

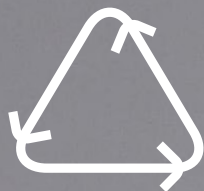


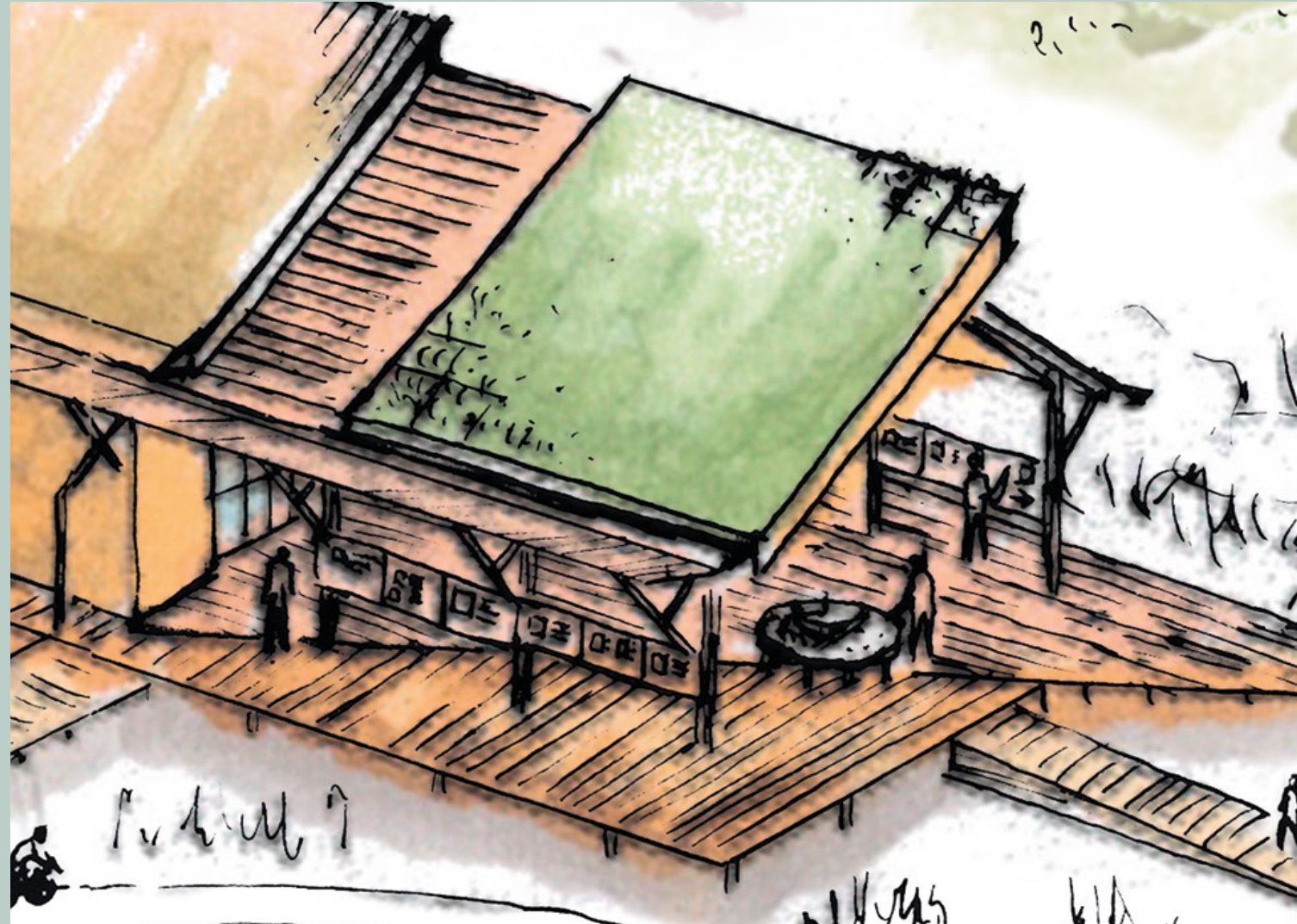
site concept











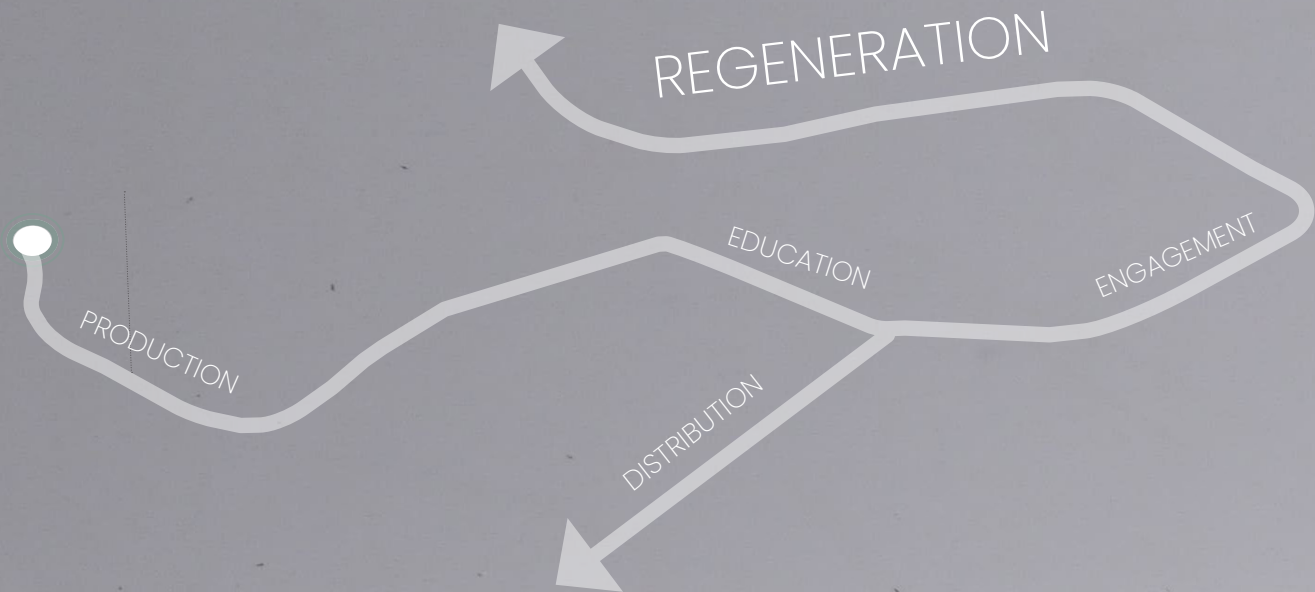
DESIGN

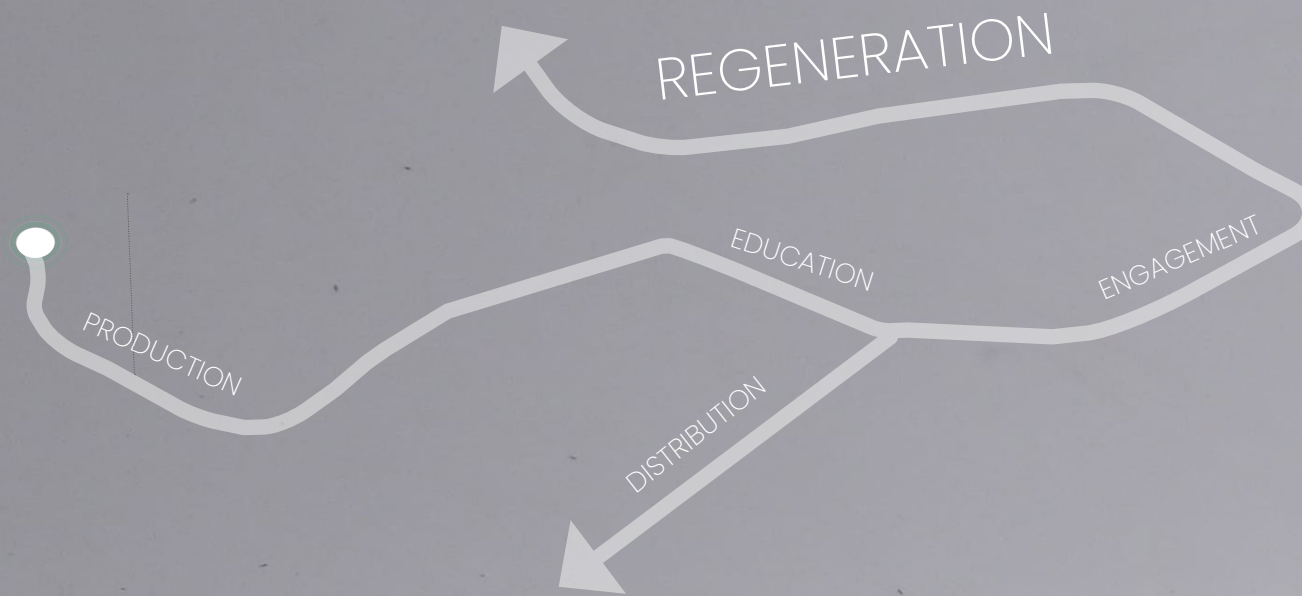


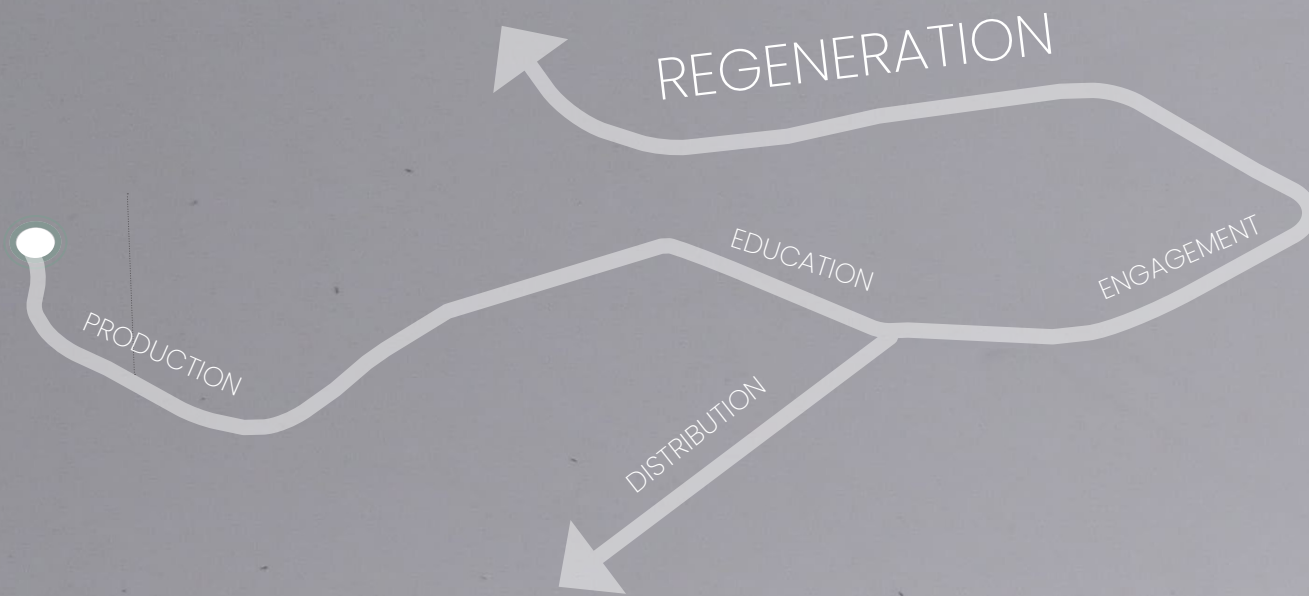
stage 0 & 1

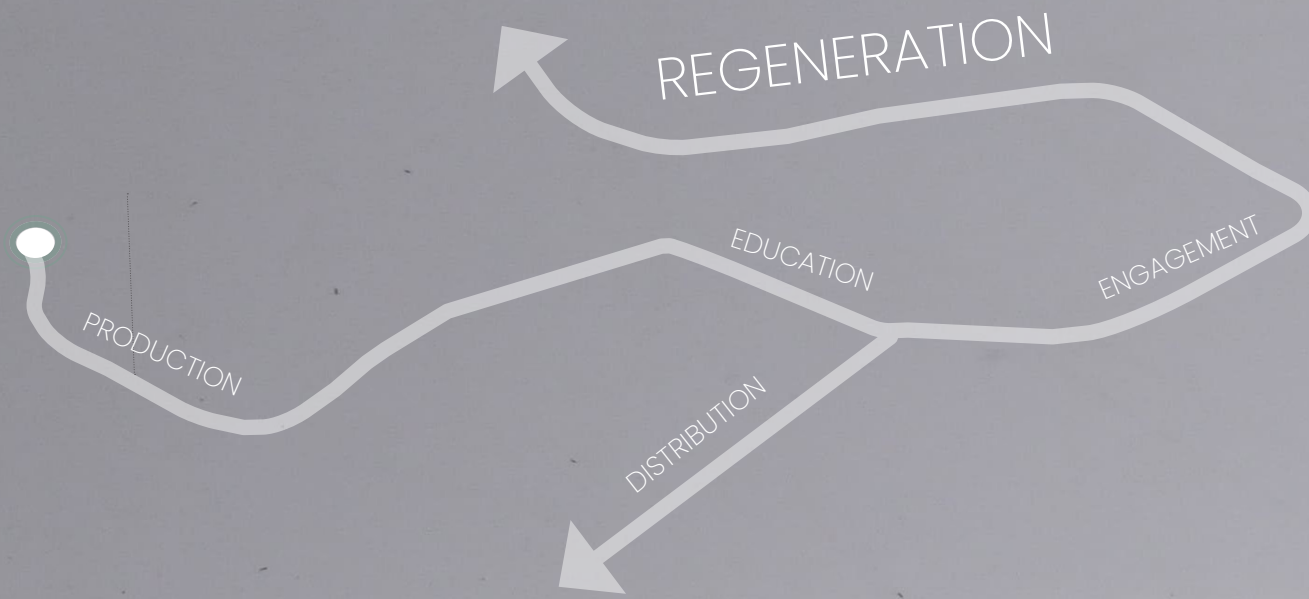
STAGES STRATEGY

- 0. **prepare production chain**
- 1. **initiate production facility**
- 2. manage and upscale production
- 3. educate self-builders
- 4. connect community
- 5. improve the system and innovate
- 6. spread of housing
- 7. downscale production





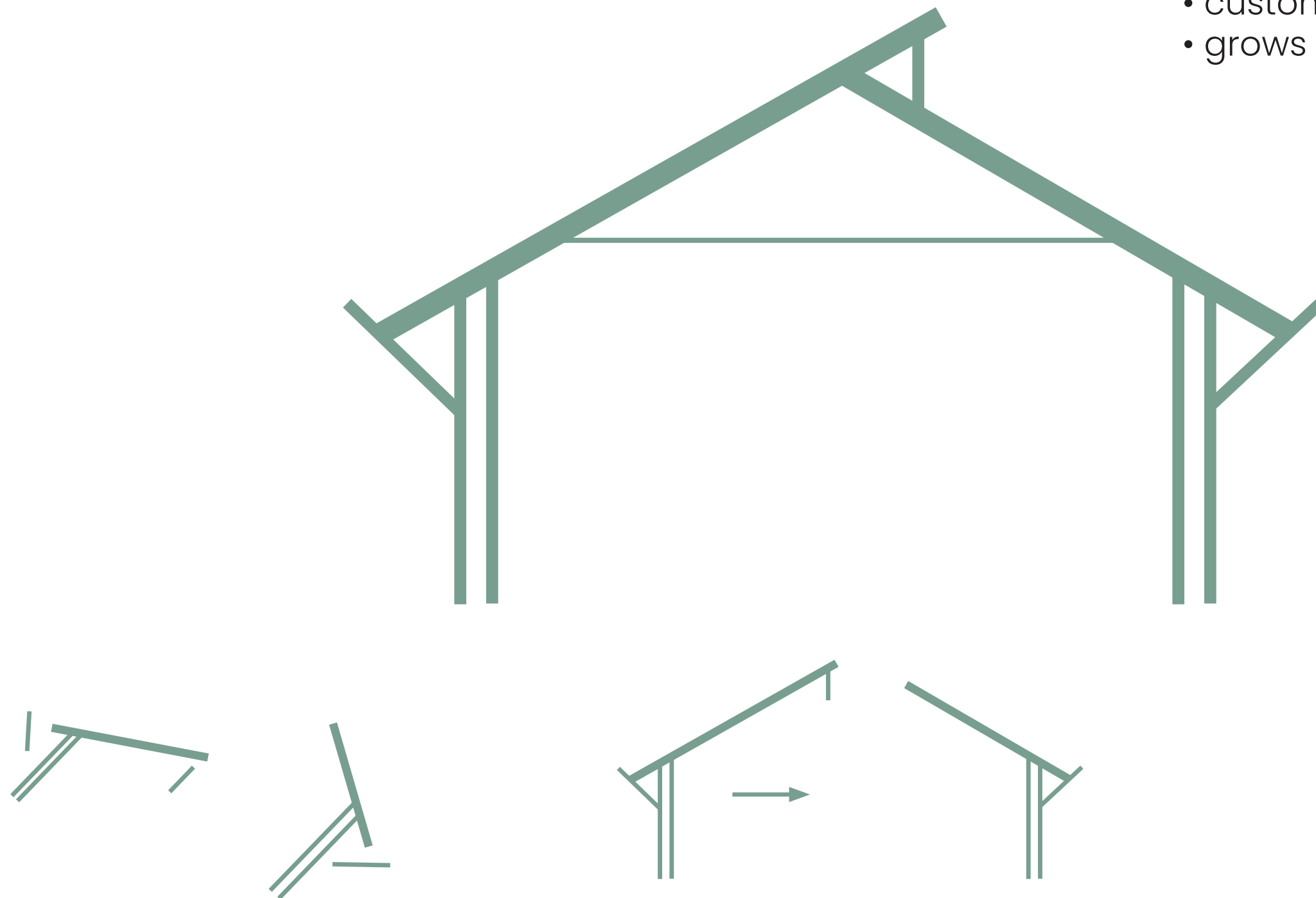




building system principle: simple

design guidelines building system:

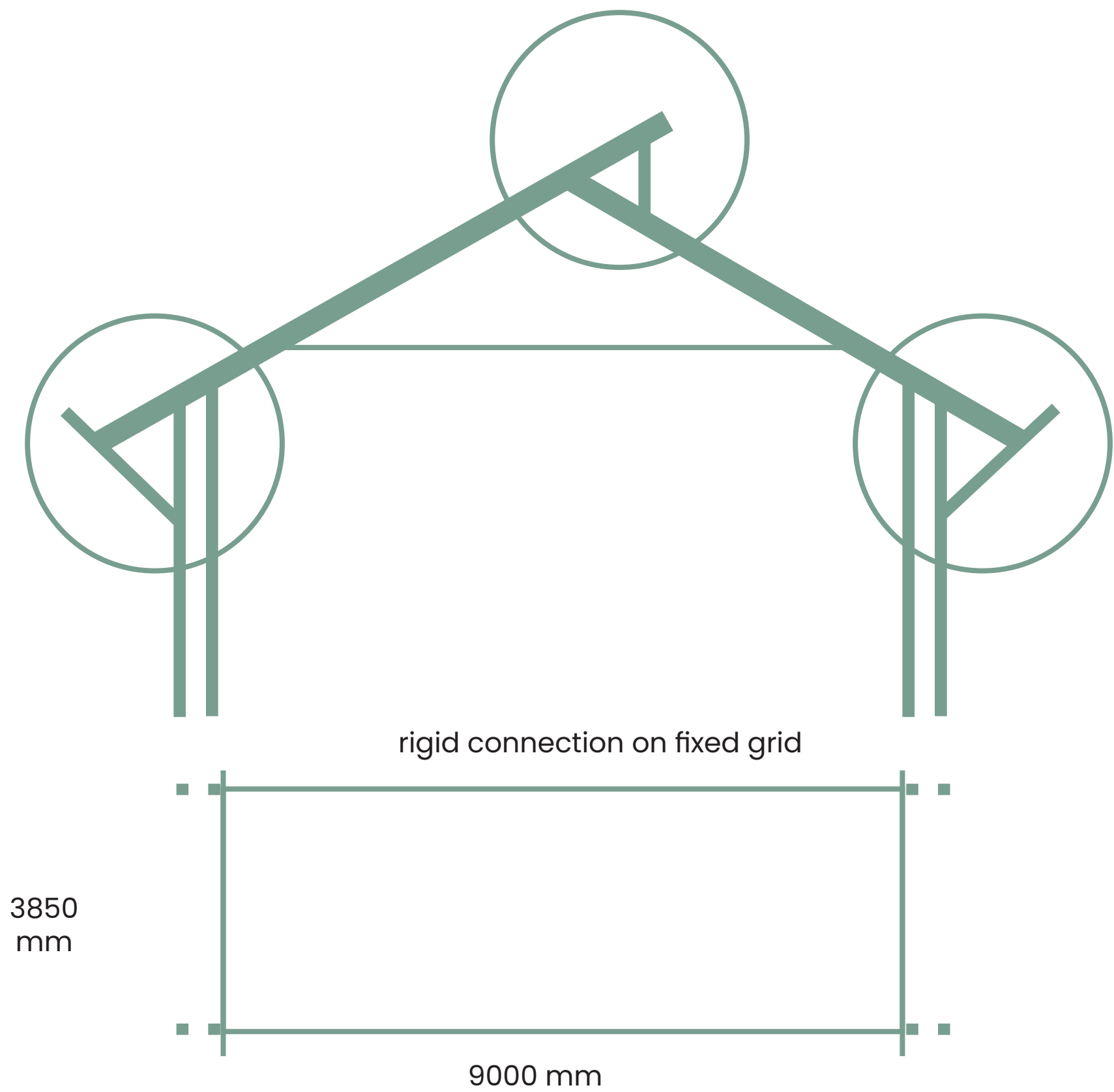
- **simple system**
- accommodate functionalities
- allows variety
- customizable (to future needs)
- grows with time



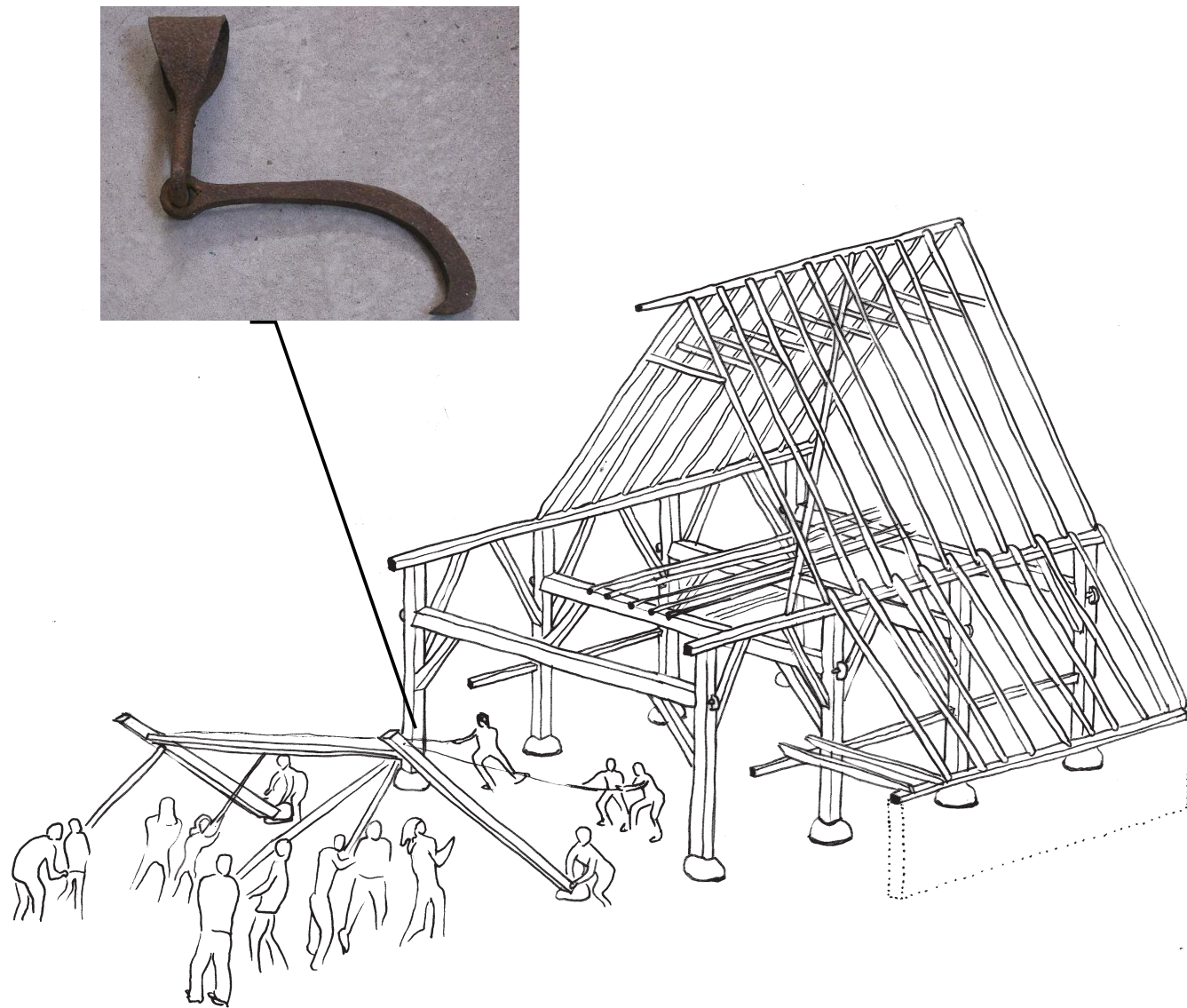
1. off-site assembly

2. fixate portal parts

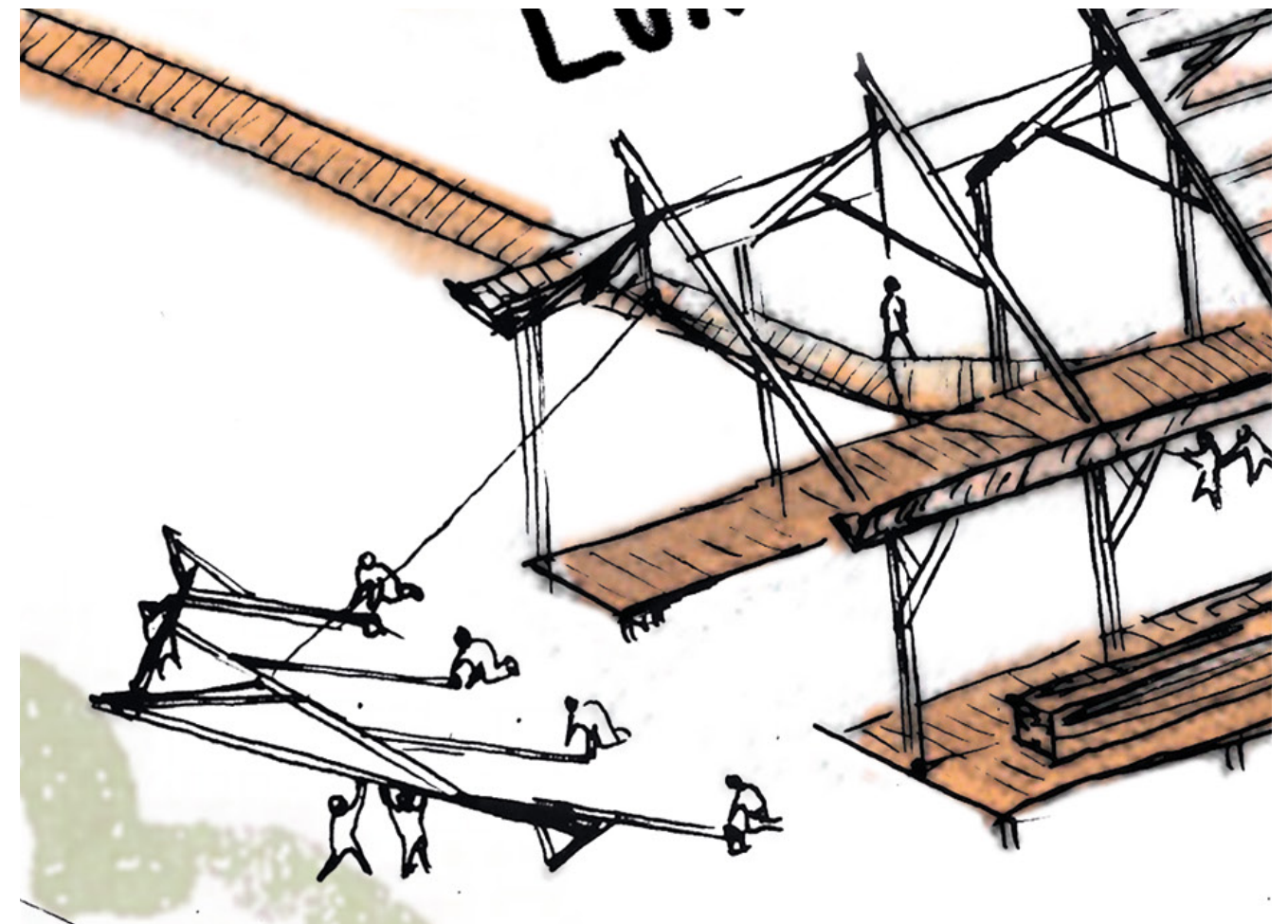
building system principle: simple



building system principle: simple



farm raising hallenhuys

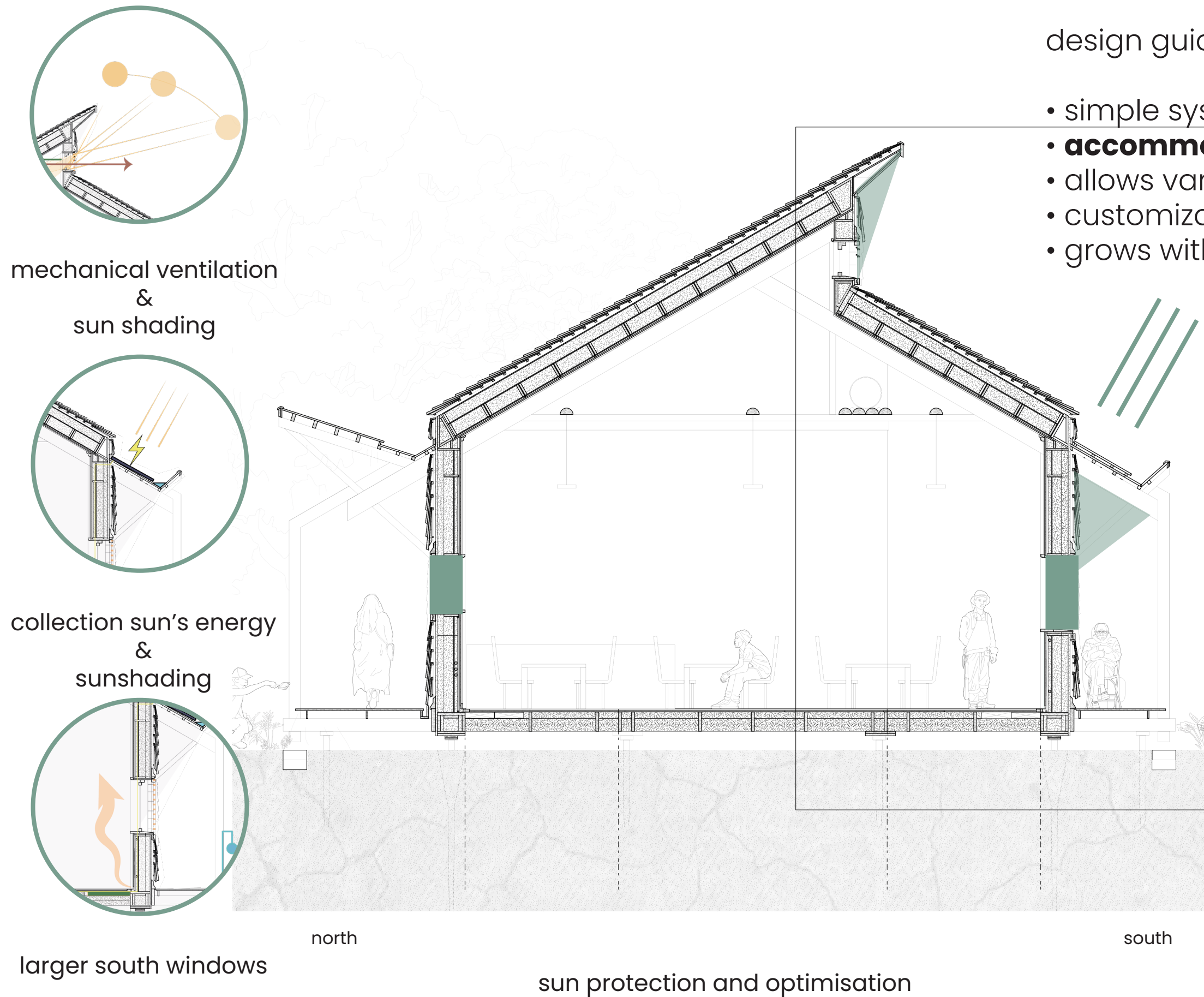


raising of main supporting frame
centre

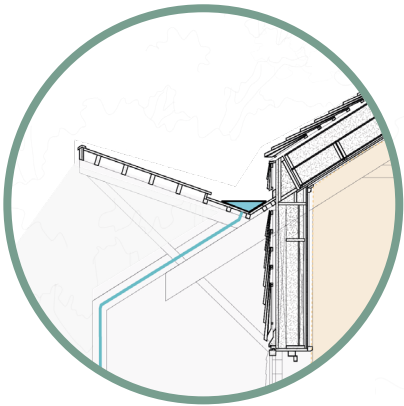
building system principle: functionalities

design guidelines building system:

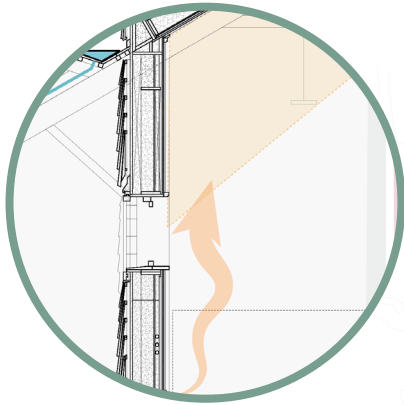
- simple system
- **accommodate functionalities**
- allows variety
- customizable (to future needs)
- grows with time



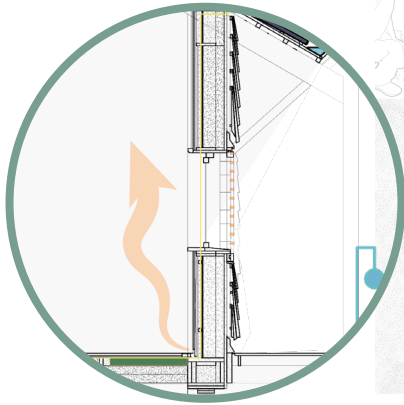
building system principle: functionalities



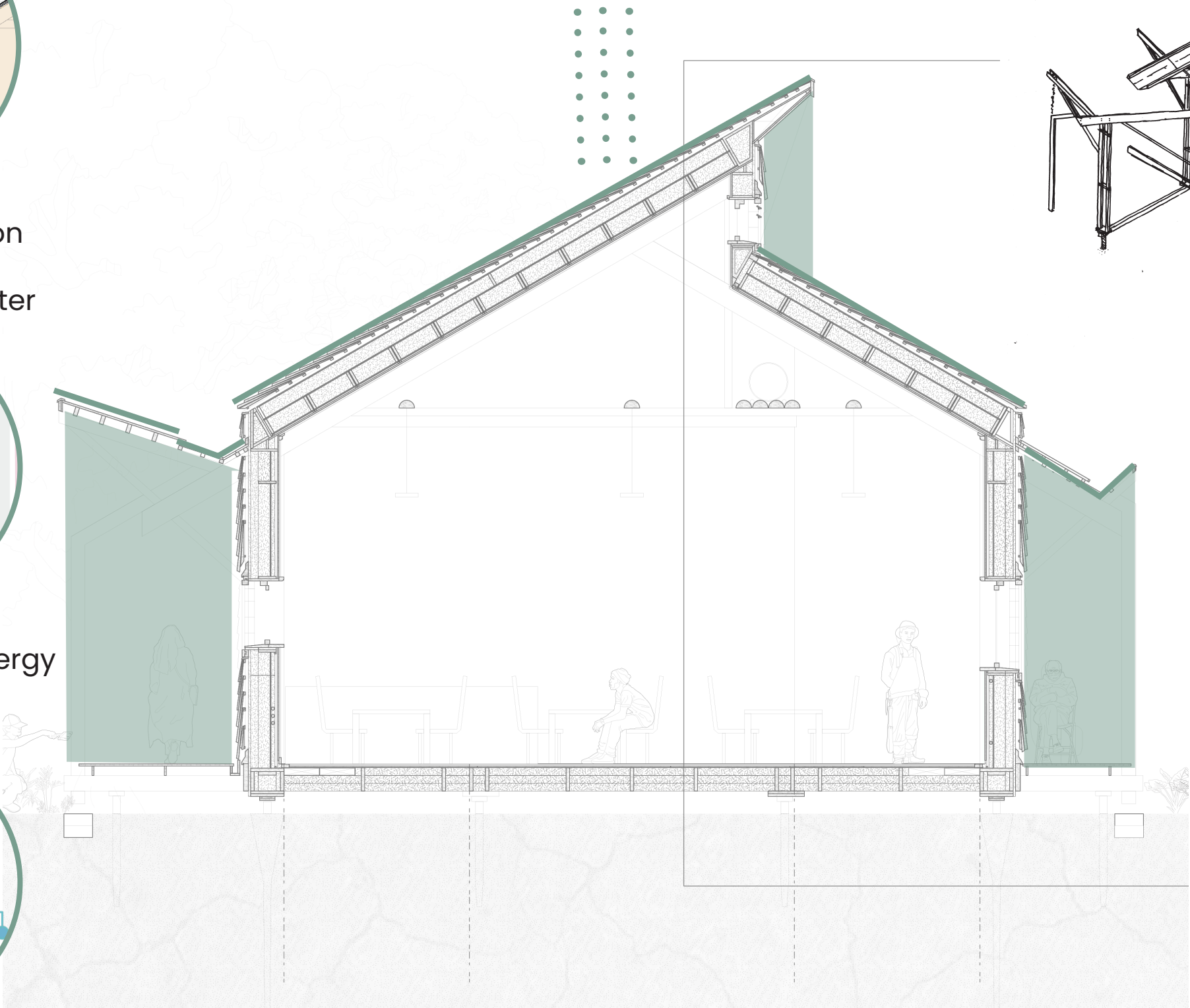
facade protection
&
collection rainwater



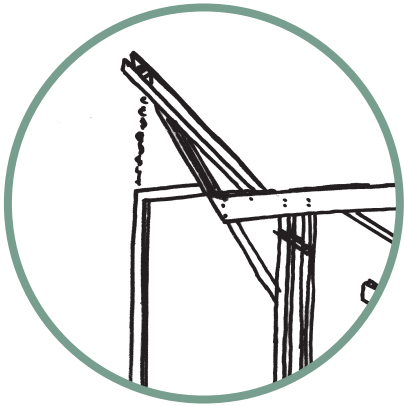
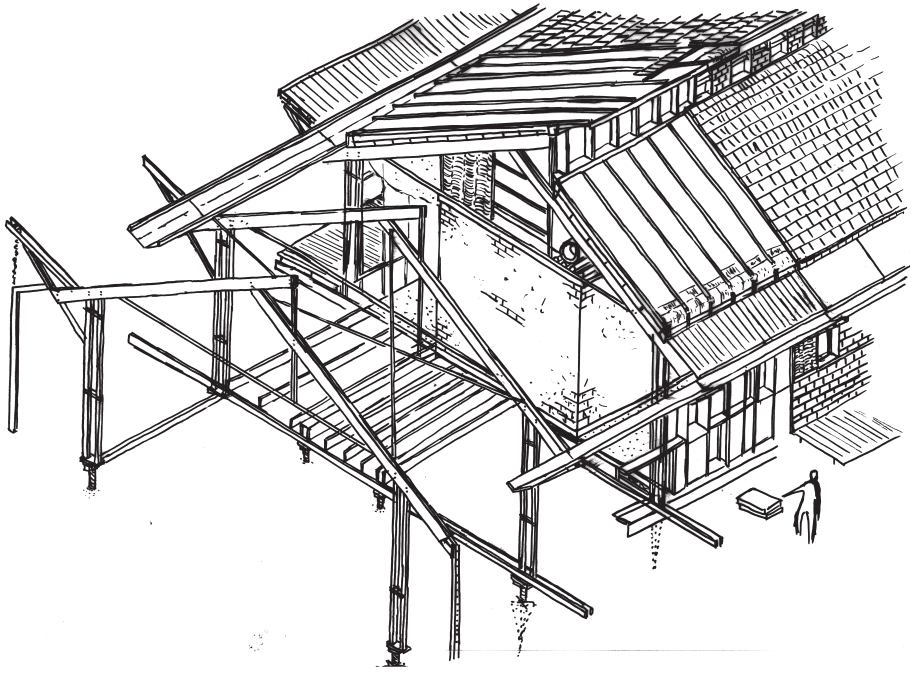
collection sun's energy
&
sunshading



larger south windows

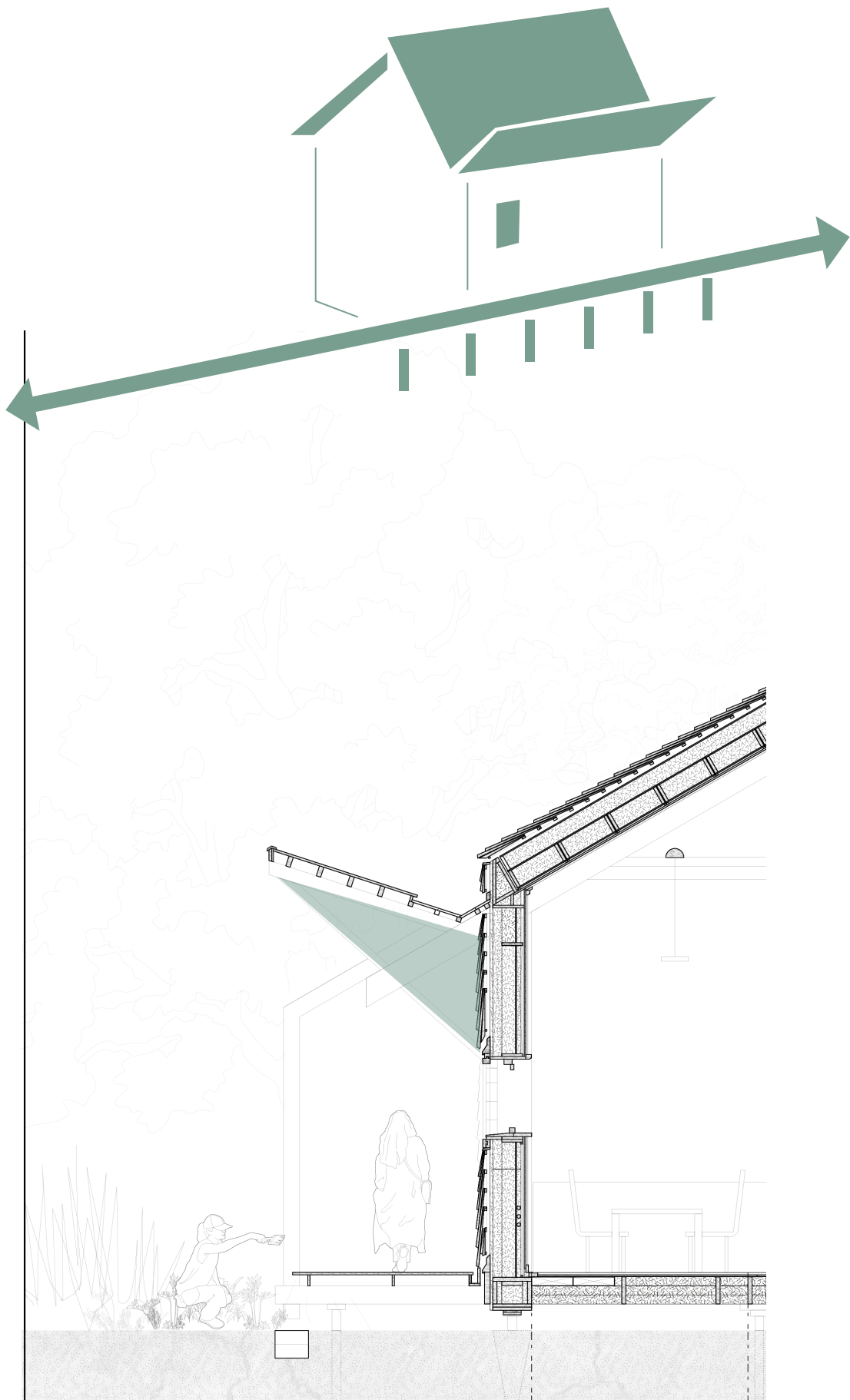


rain protection and collection

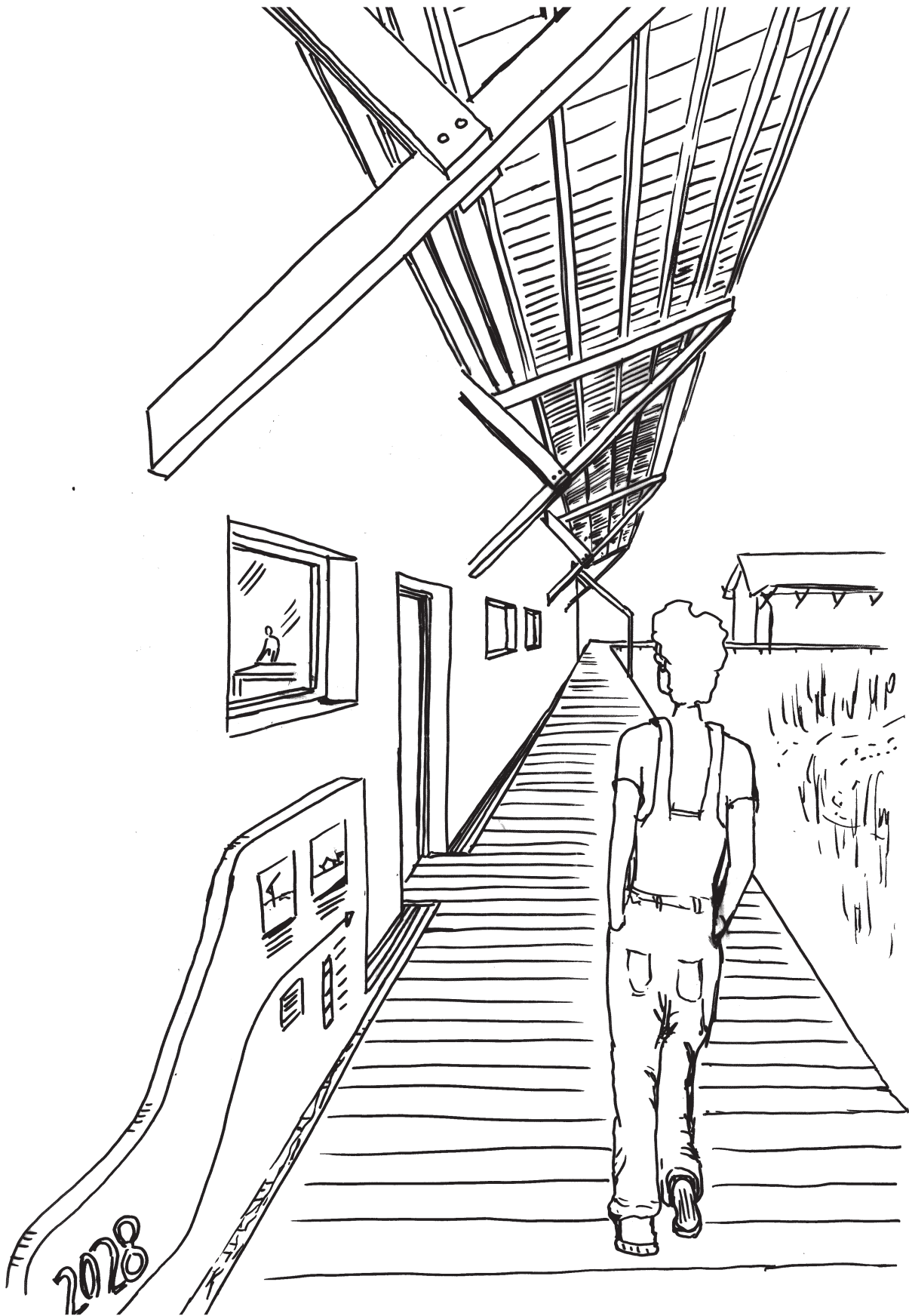


gutter & rain pipe integrated in
frames

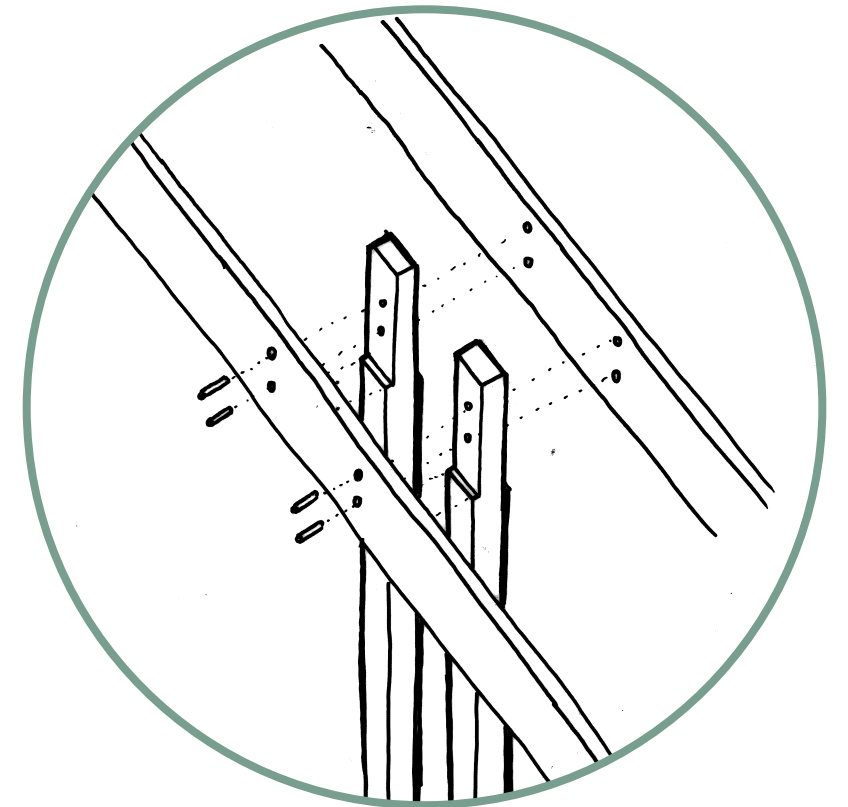
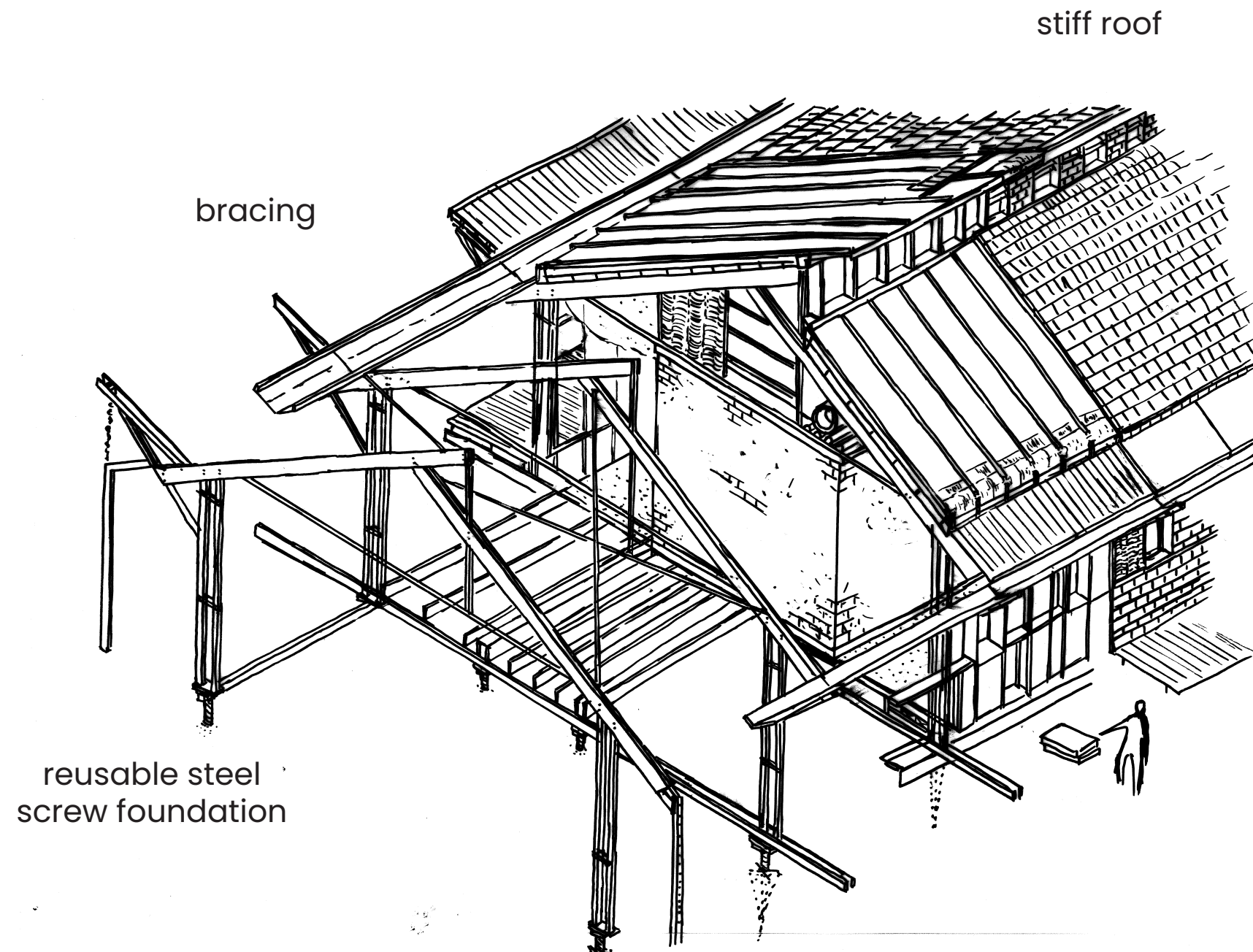
building system principle: architecture



canopy time path



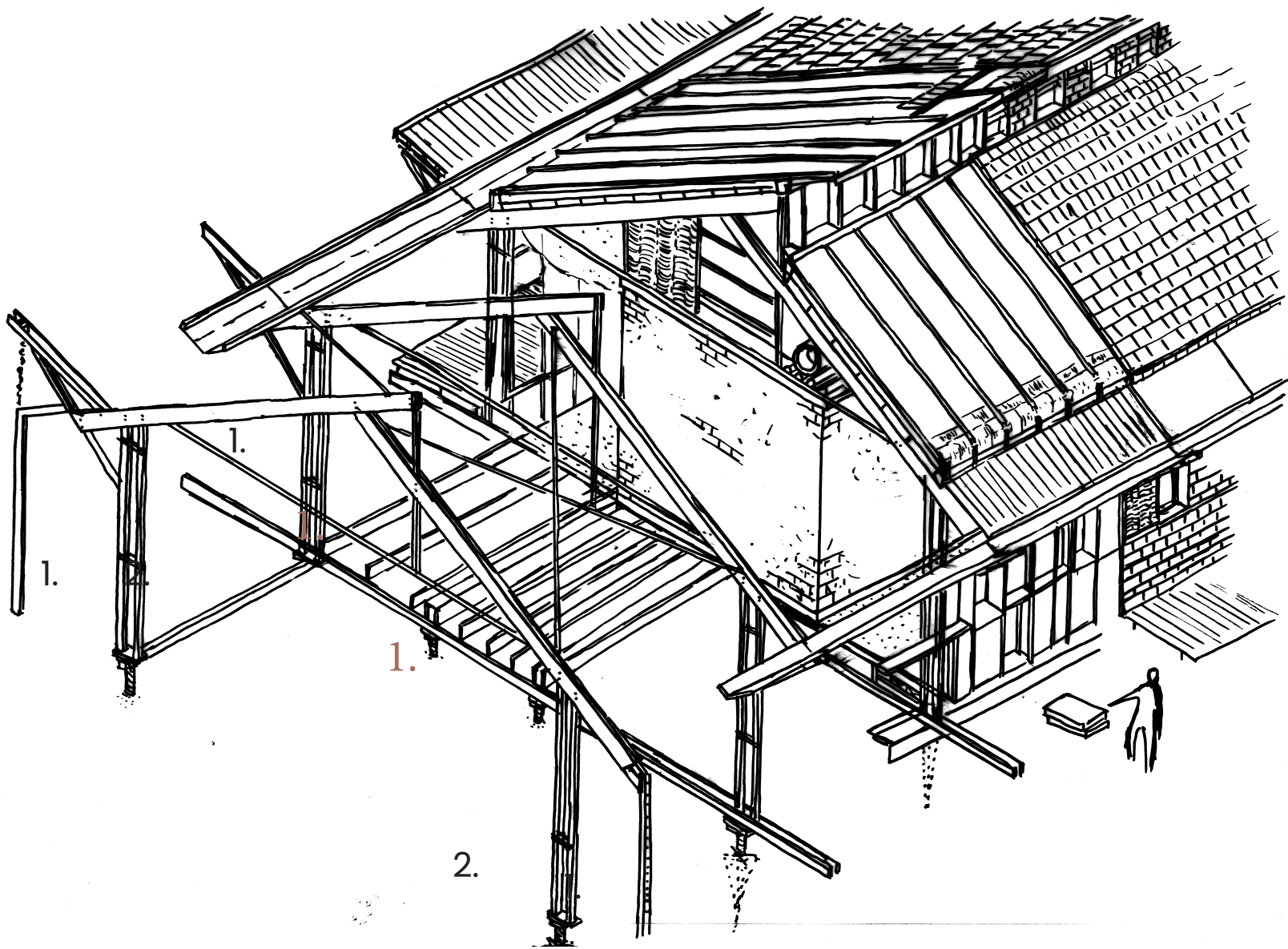
building system principle: construction



half-lap joinery and peg-and-hole

construction principle

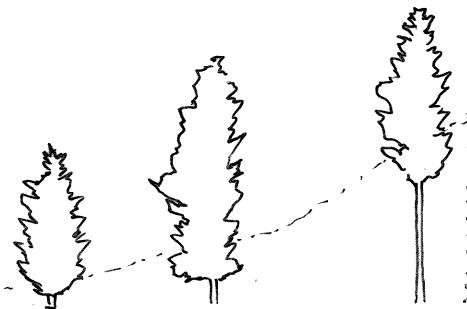
building system principle: materials



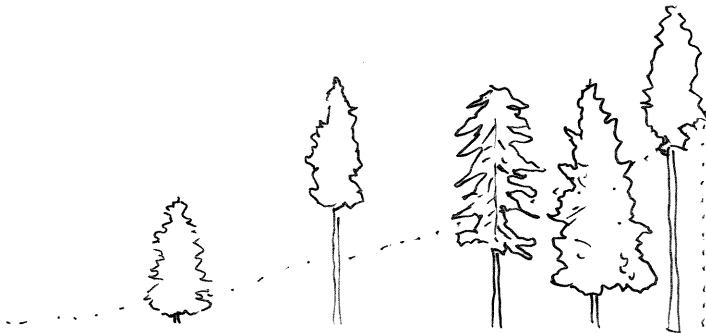
initial
supply



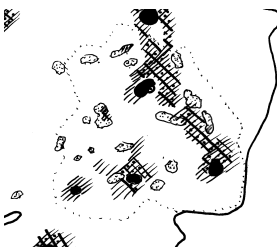
1. larch (lariks)



2. norway
spruce
(douglas)

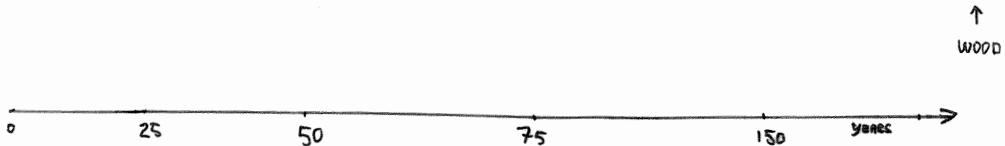


regenerative
supply

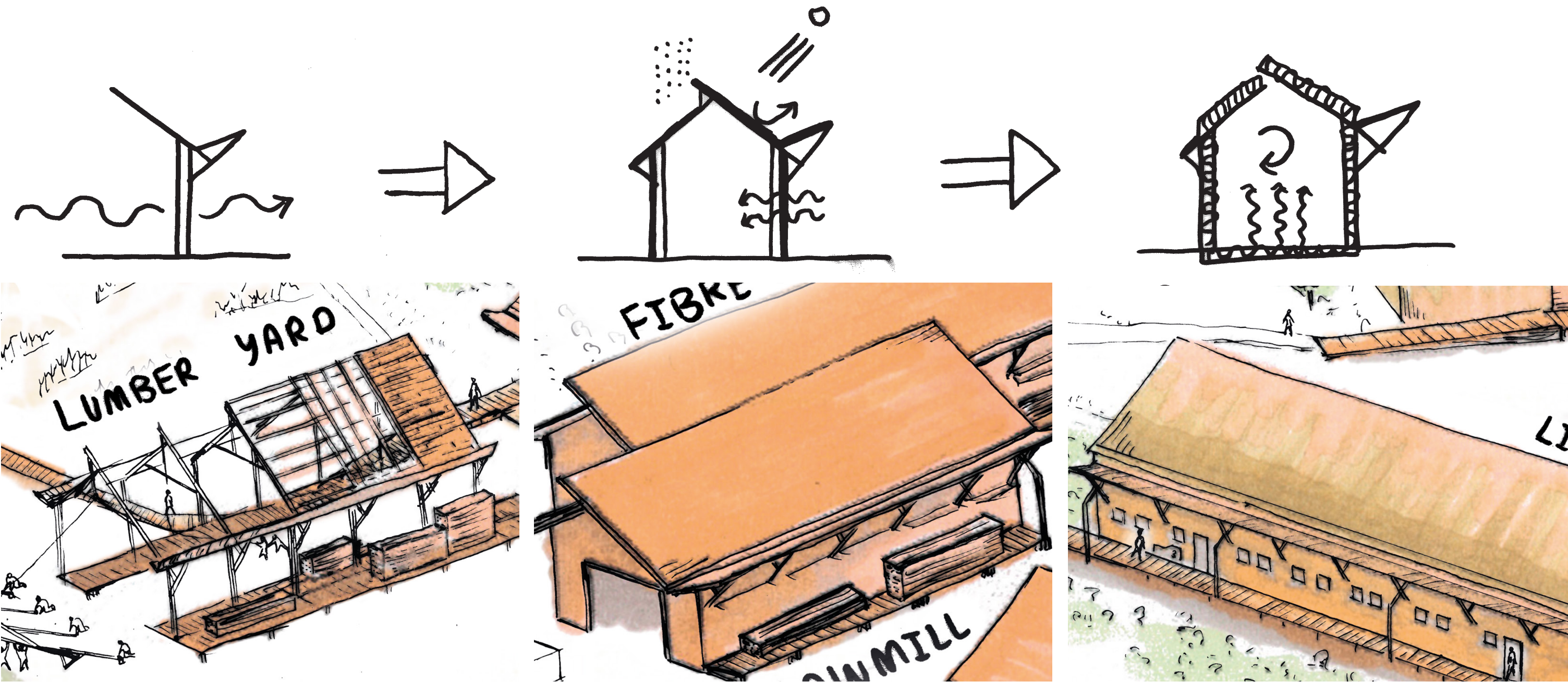


1. scots pine
(grove den)

2. silver fir
(fjinspar)



building system principle: main variants



drying

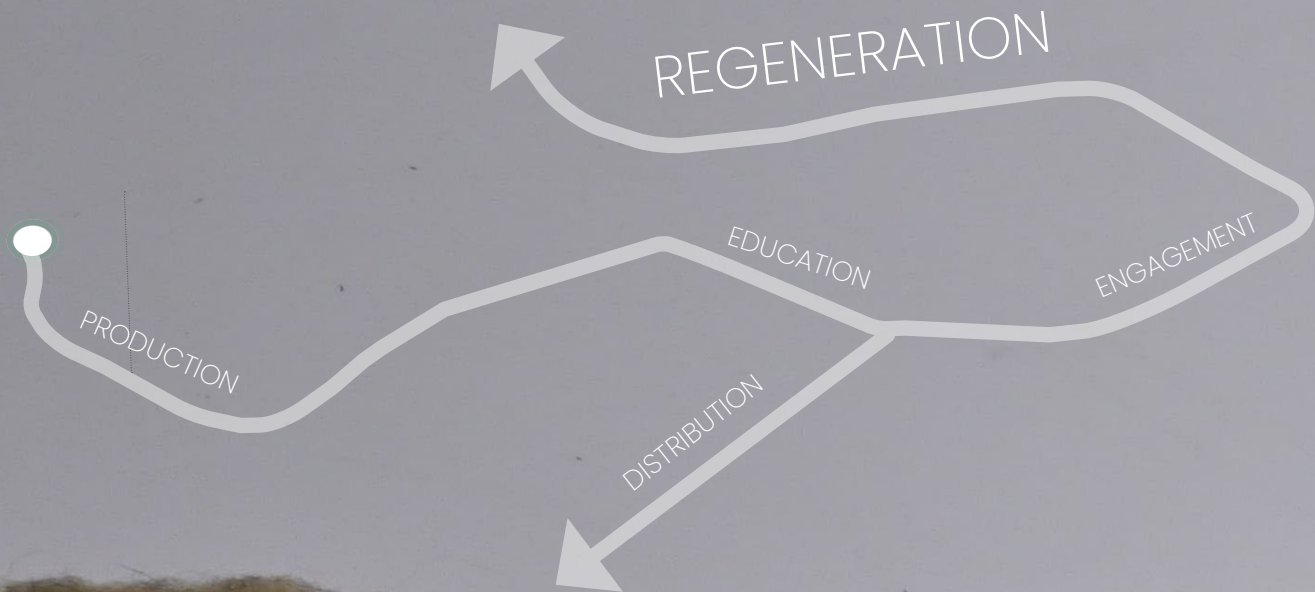
production hall

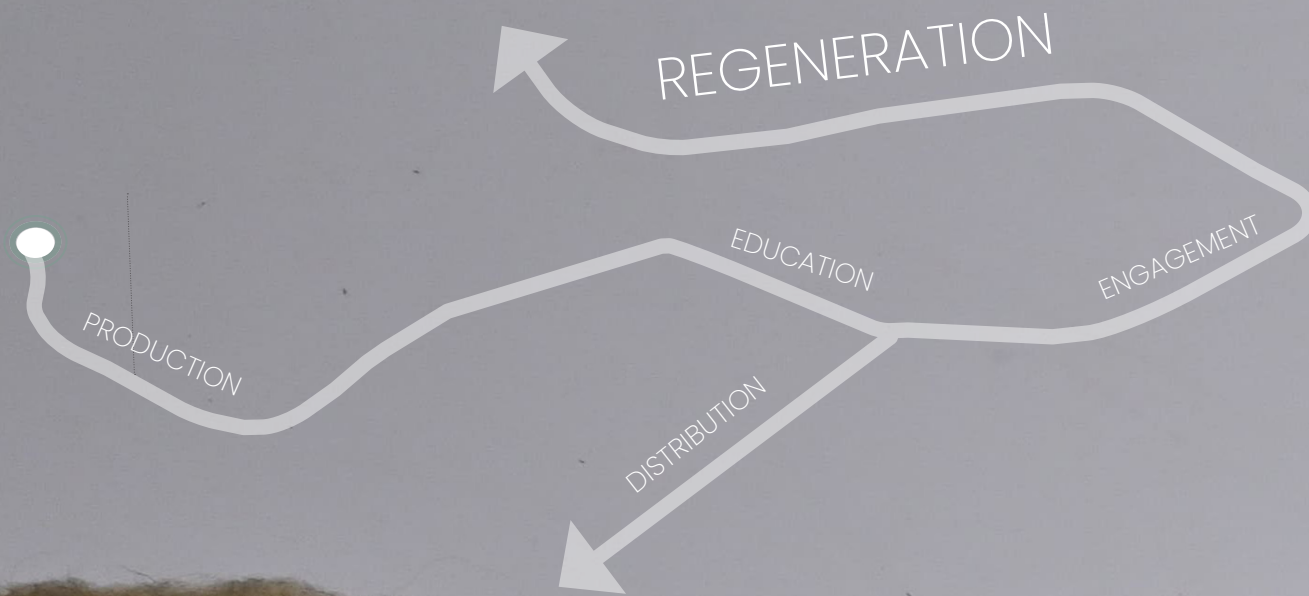
insulated space

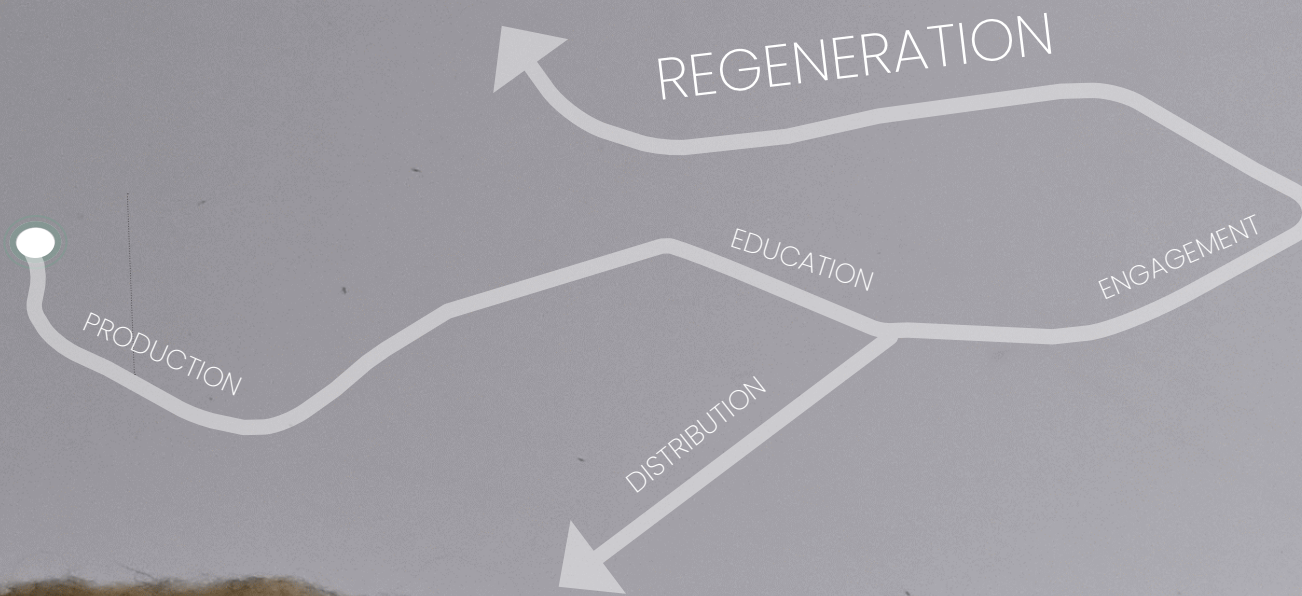
stage 2

STAGES STRATEGY

- 0. prepare production chain
- 1. initiate production facility
- 2. **manage and upscale production**
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- 4. connect community
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- 6. spread of housing
- 7. downscale production



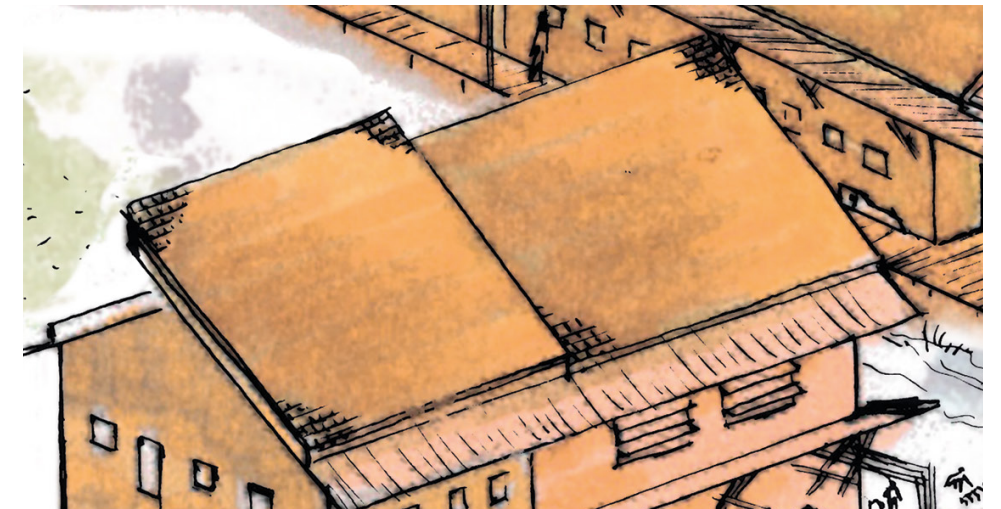
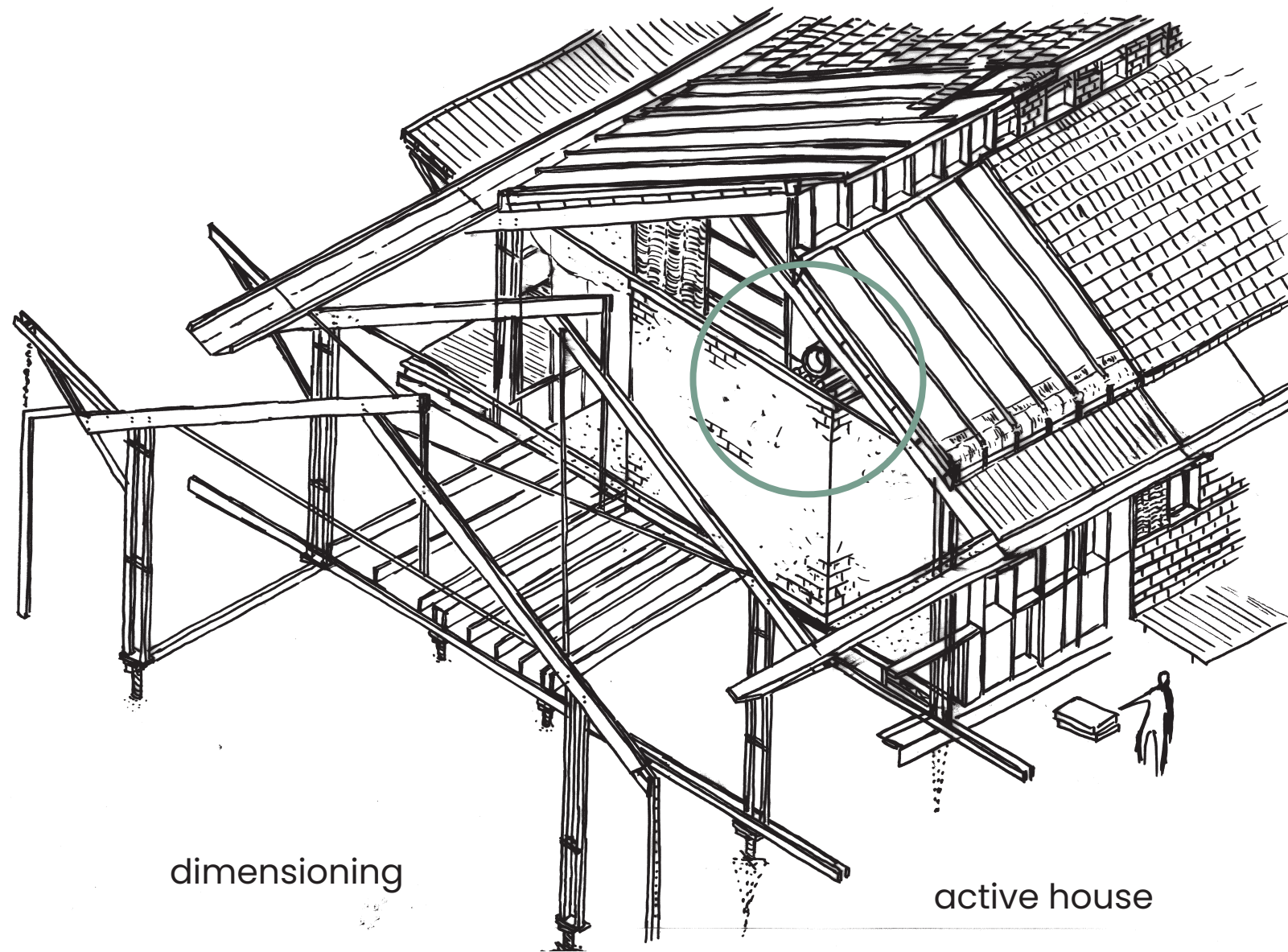




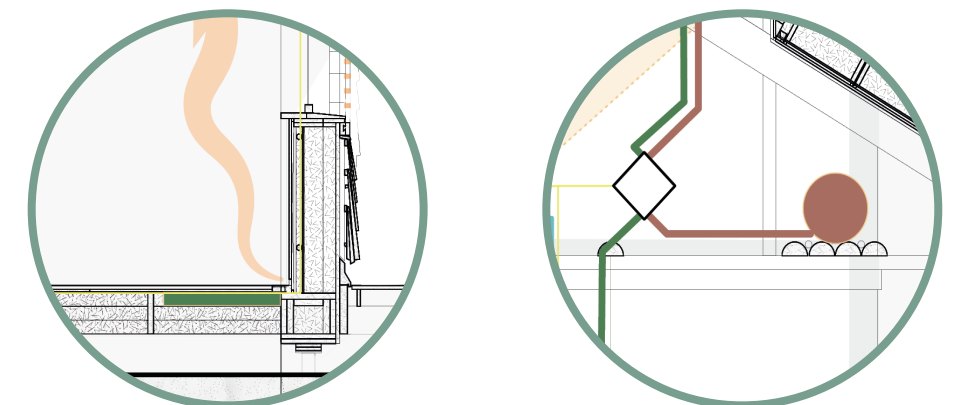
insulation principle

design guidelines building system:

- simple system
- accommodate functionalities
- **allows variety**
- customizable (to future needs)
- grows with time

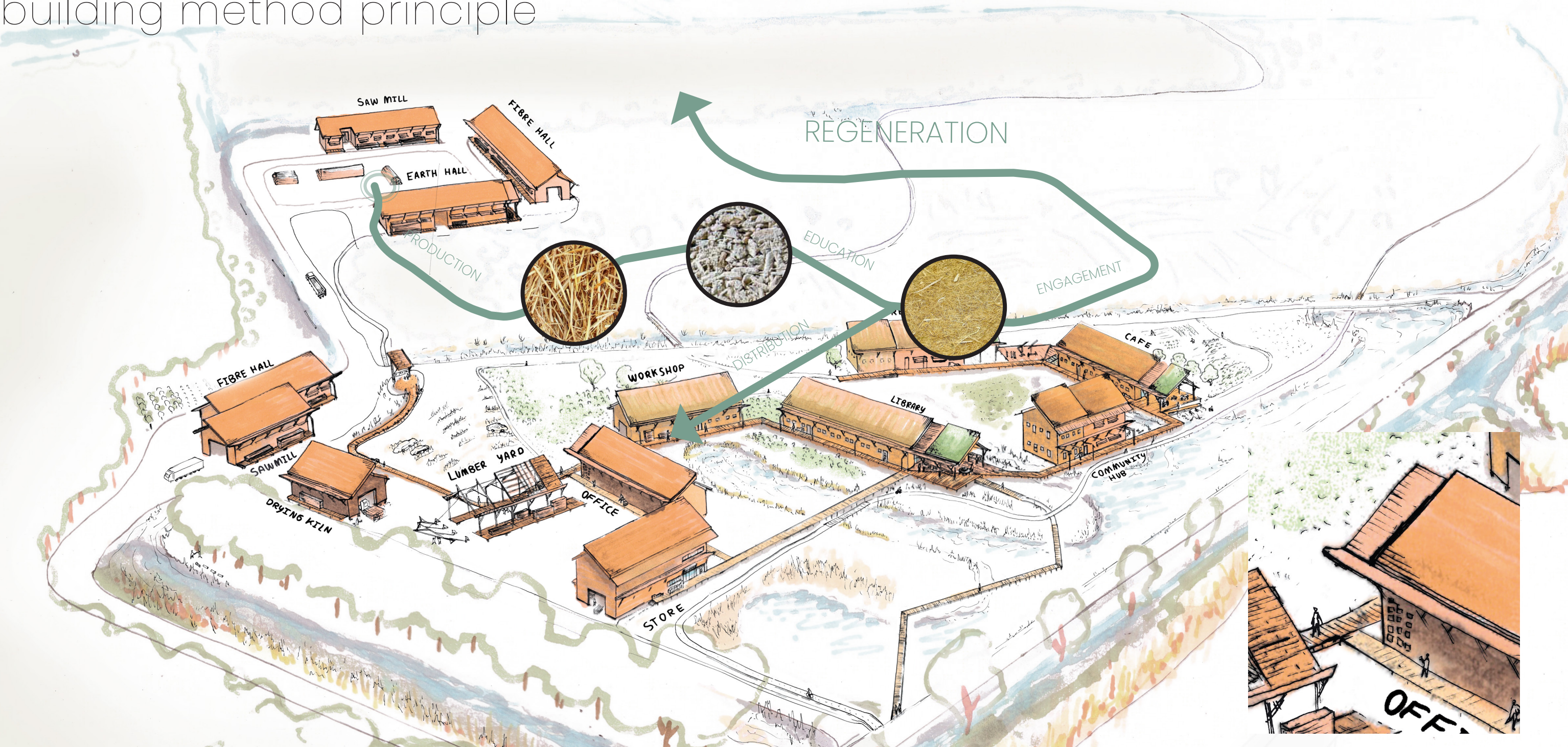


choice in thickness & material



heating & ventilation

building method principle

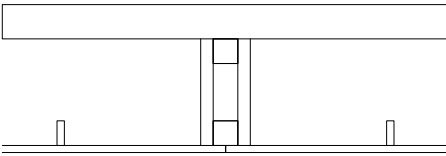


initially available

quickly available

wanted

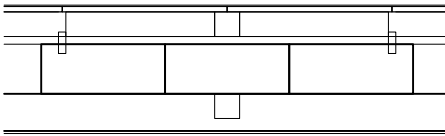
prefab



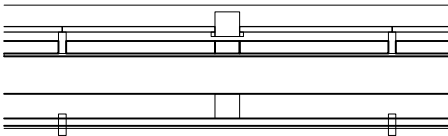
production



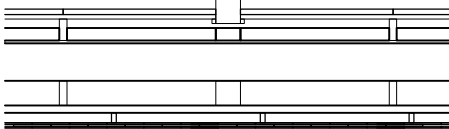
strawbale



hempcrete
cast and brick

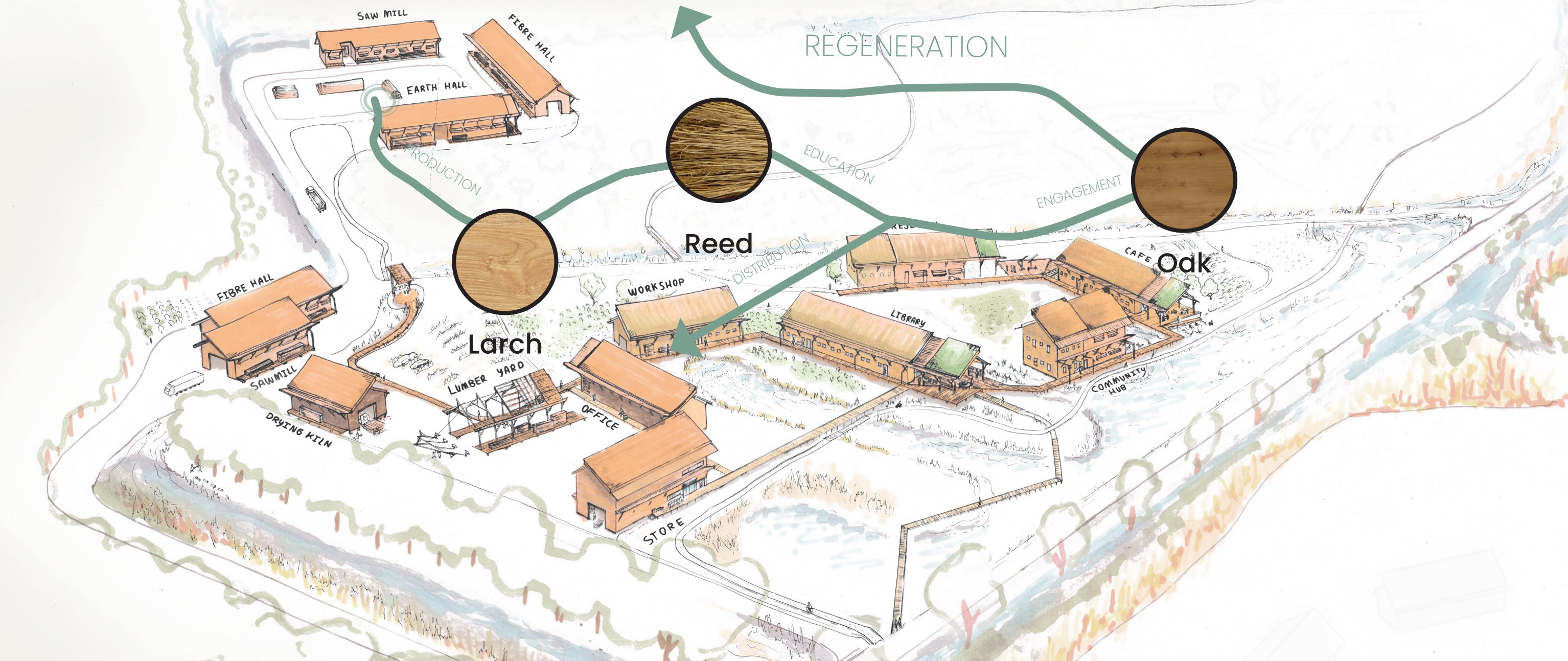


hemp mat



flax mat

material principle skin



initially available quickly available wanted prefab

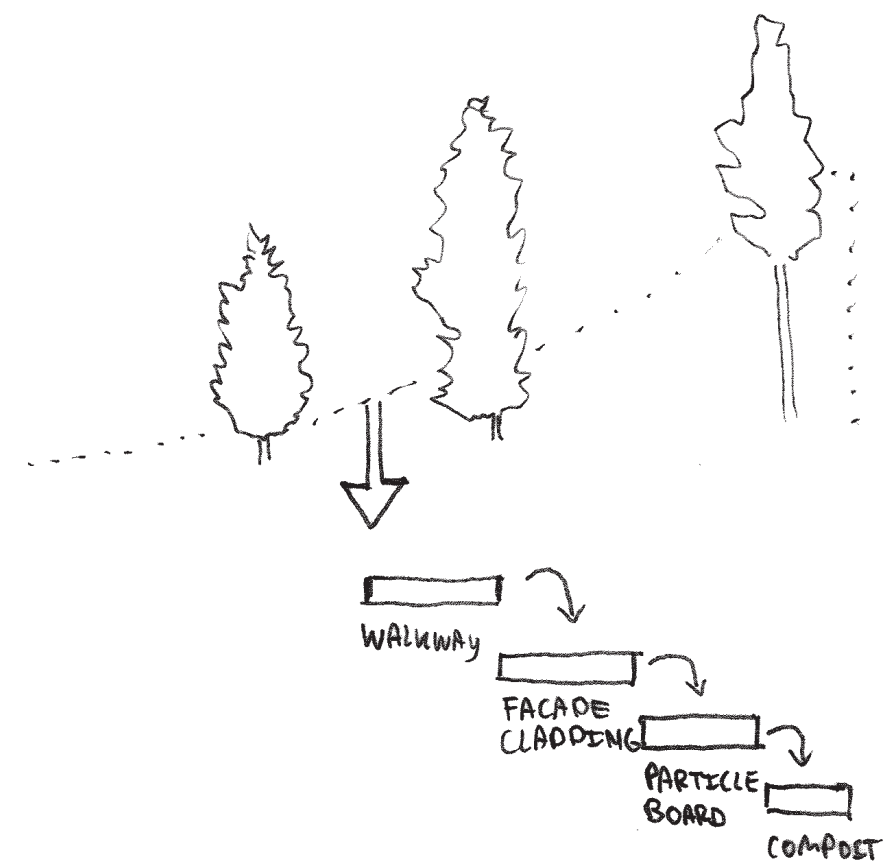


Excavated earth as common material

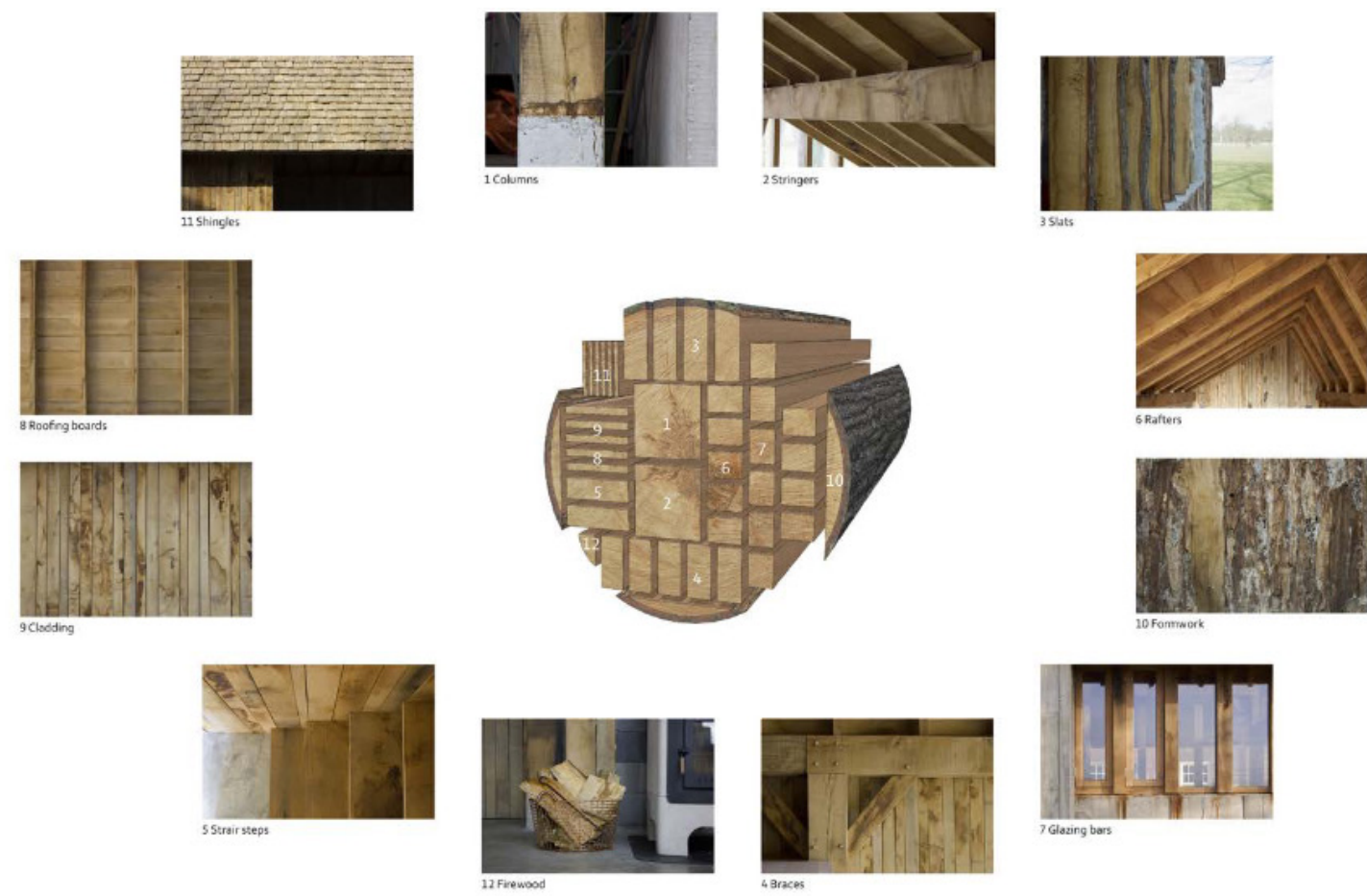
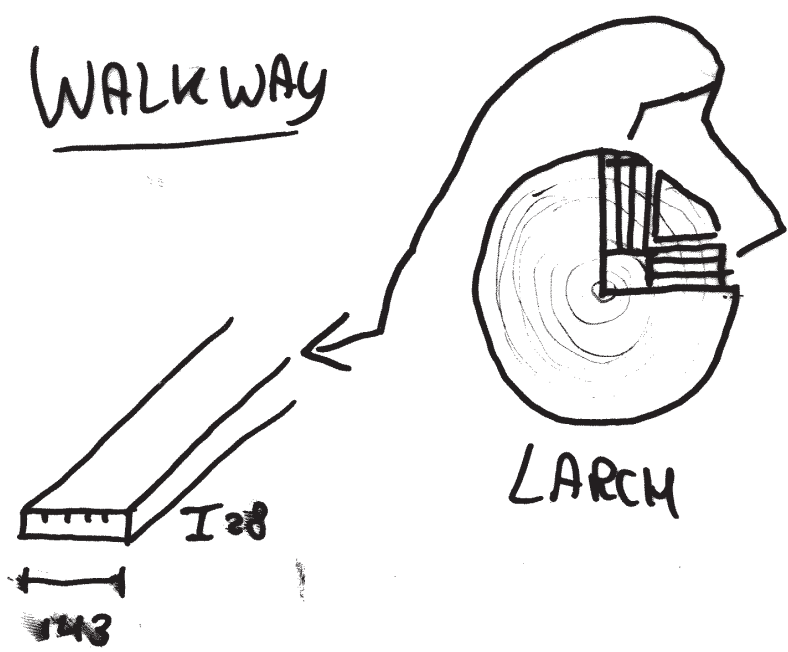


Willow and reed panels south facade sunshading

material cascading

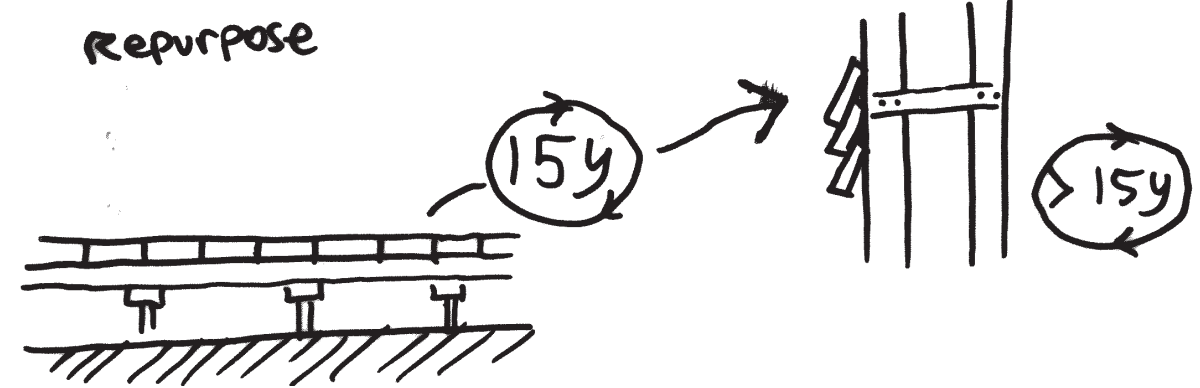


larch cascading



* hilberinkbosch architecten

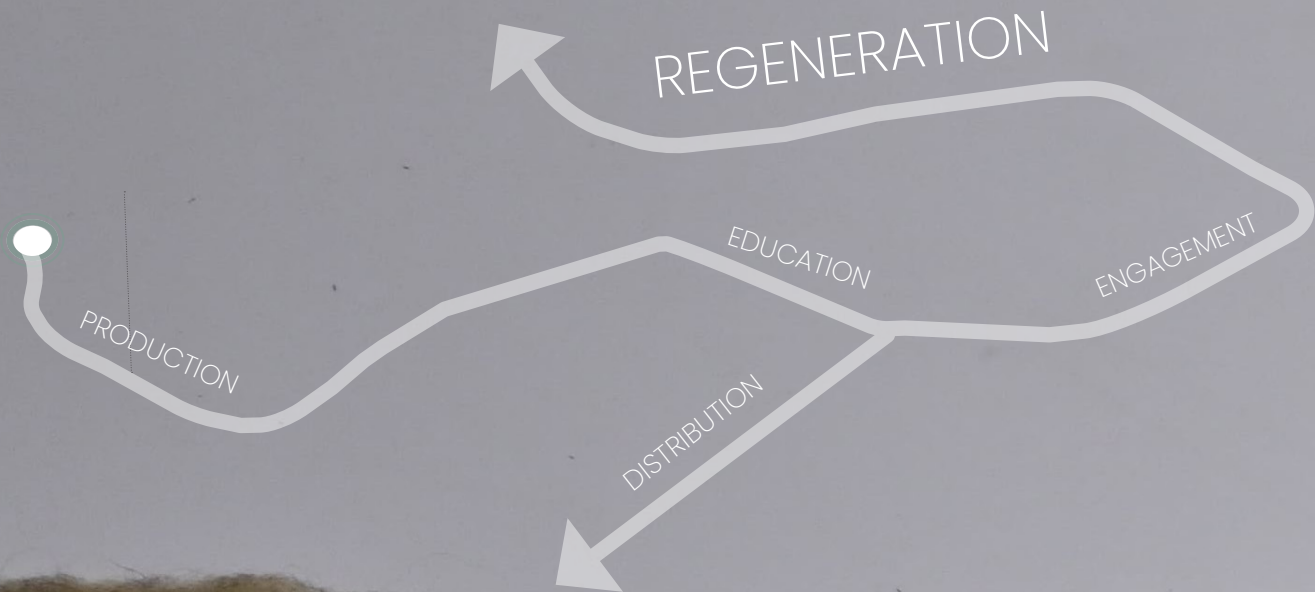
application timber according to sawing

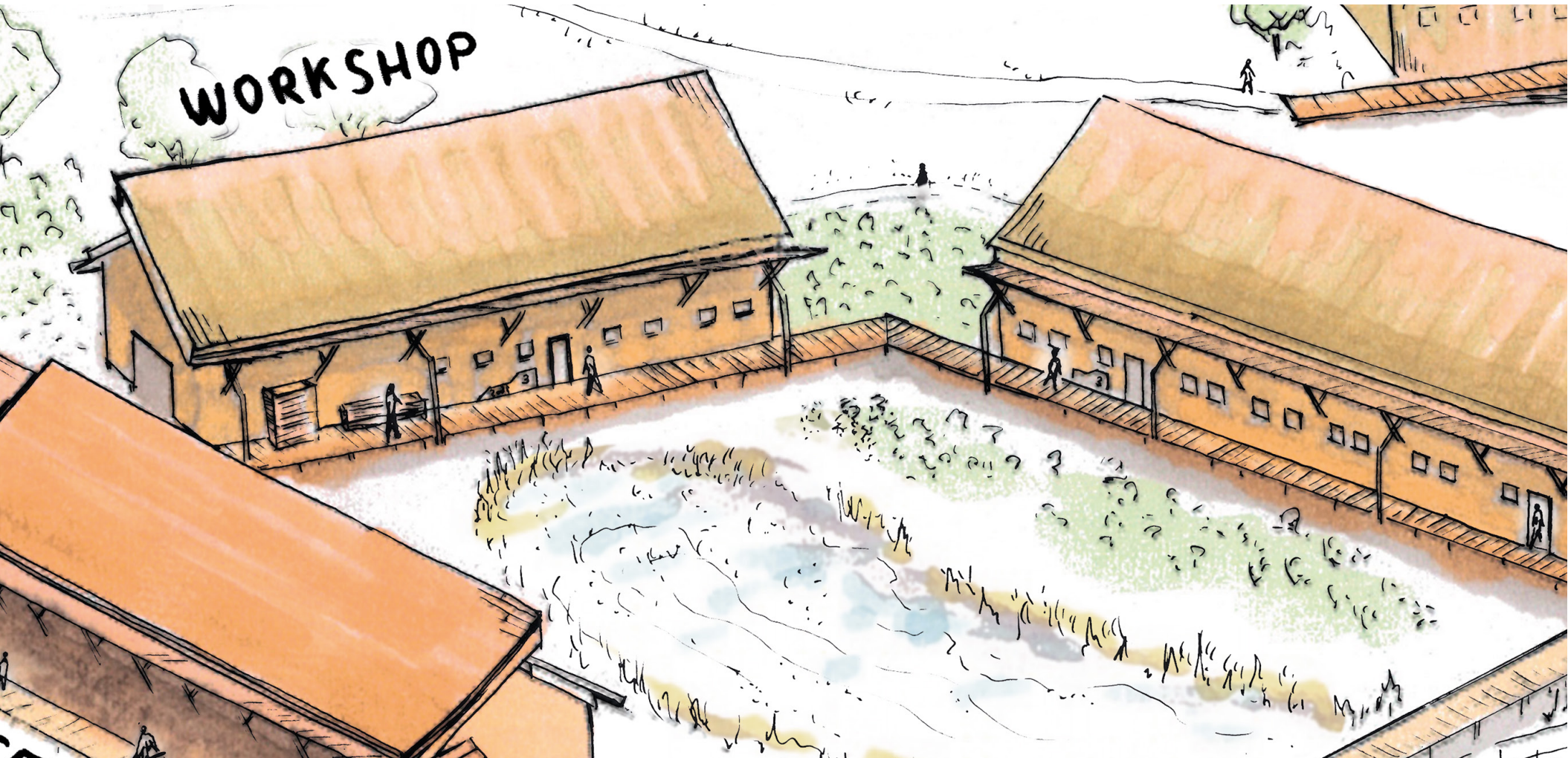


stage 3

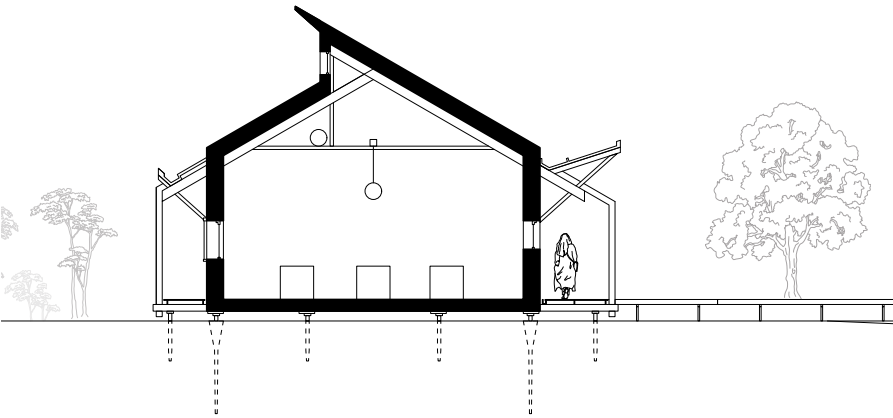
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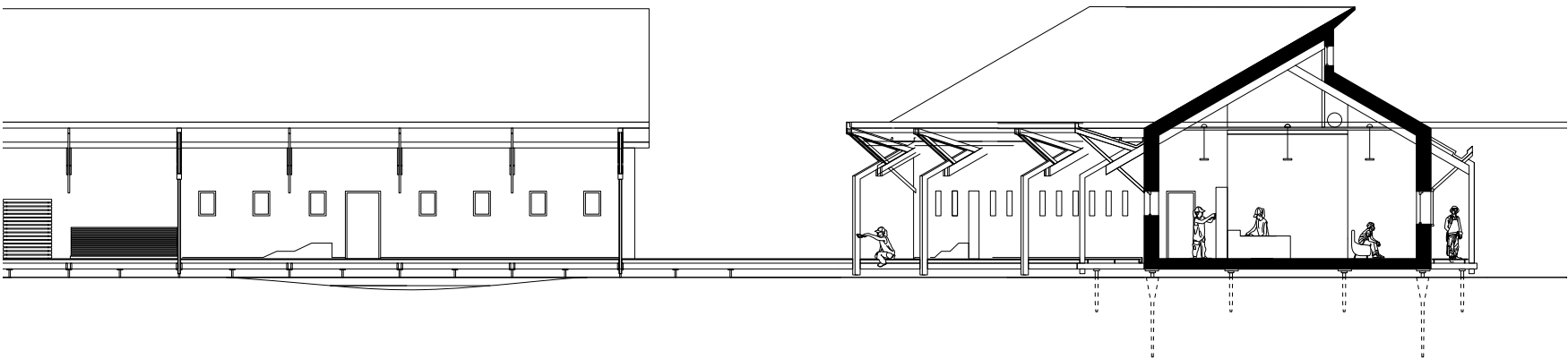




wood workshop and library

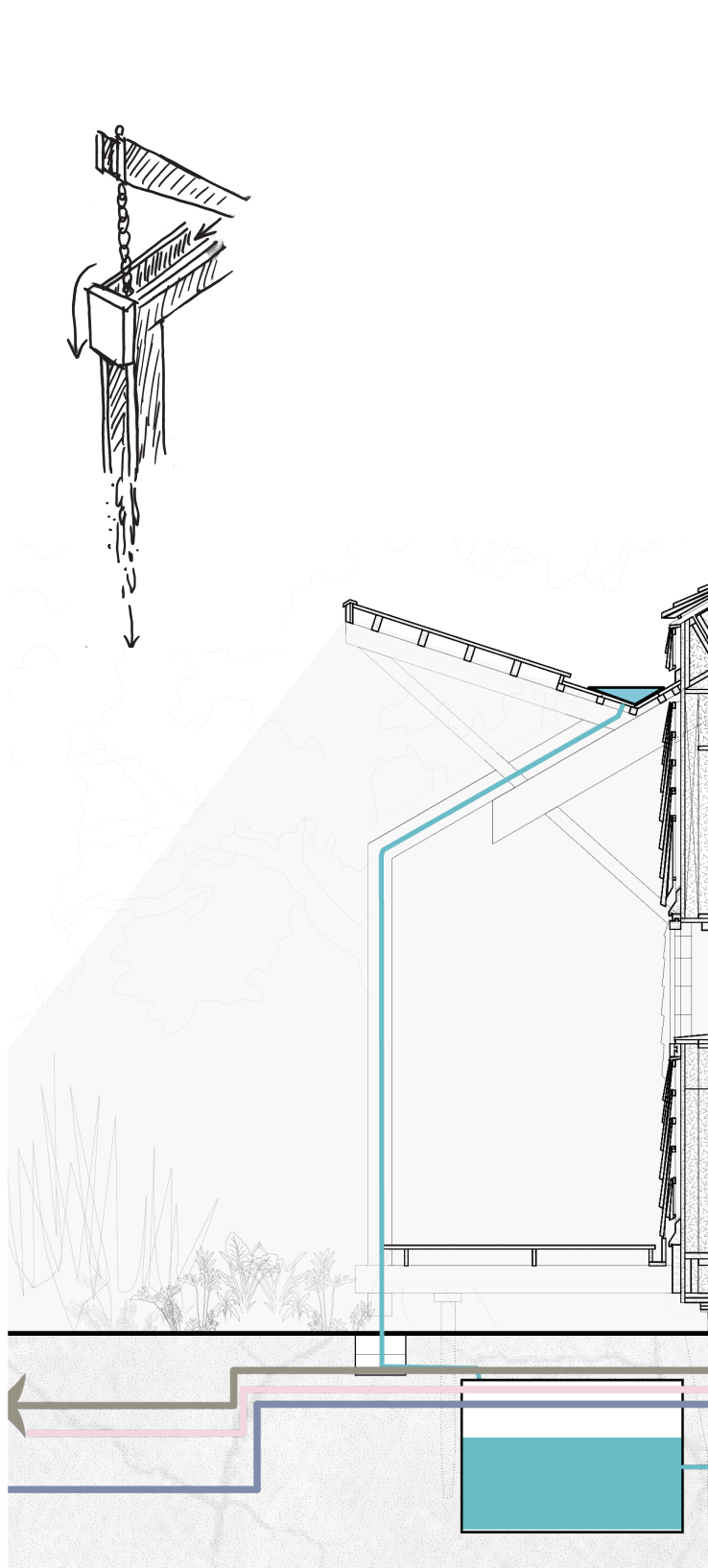


wood workshop

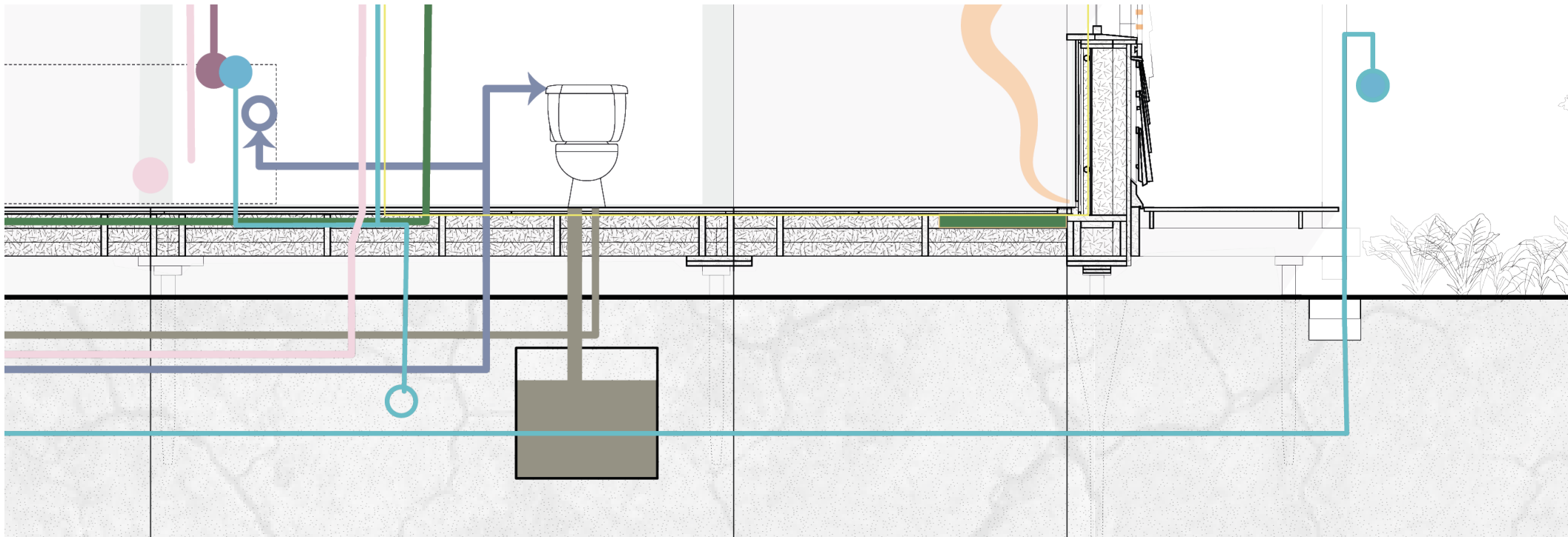
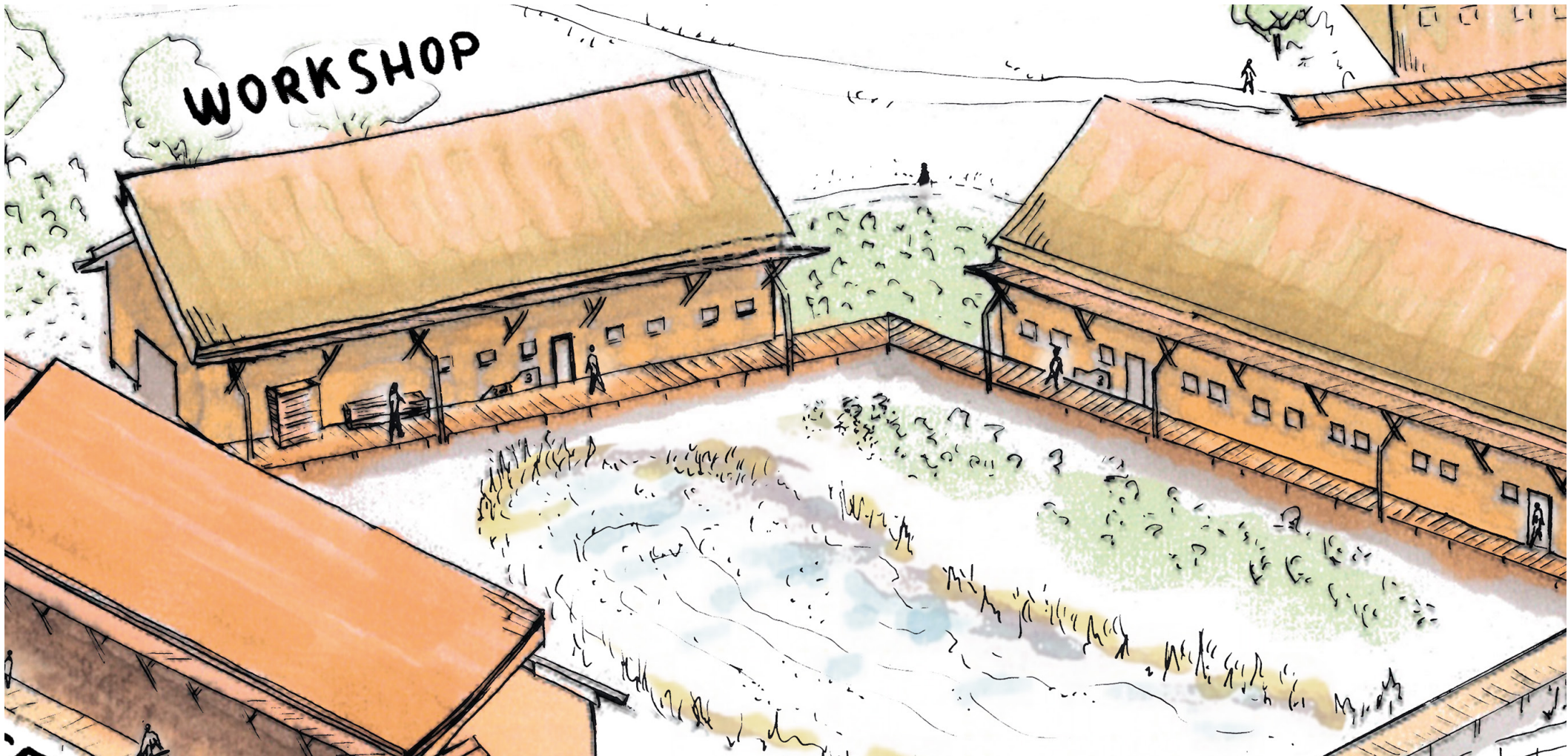


wood workshop

water systems



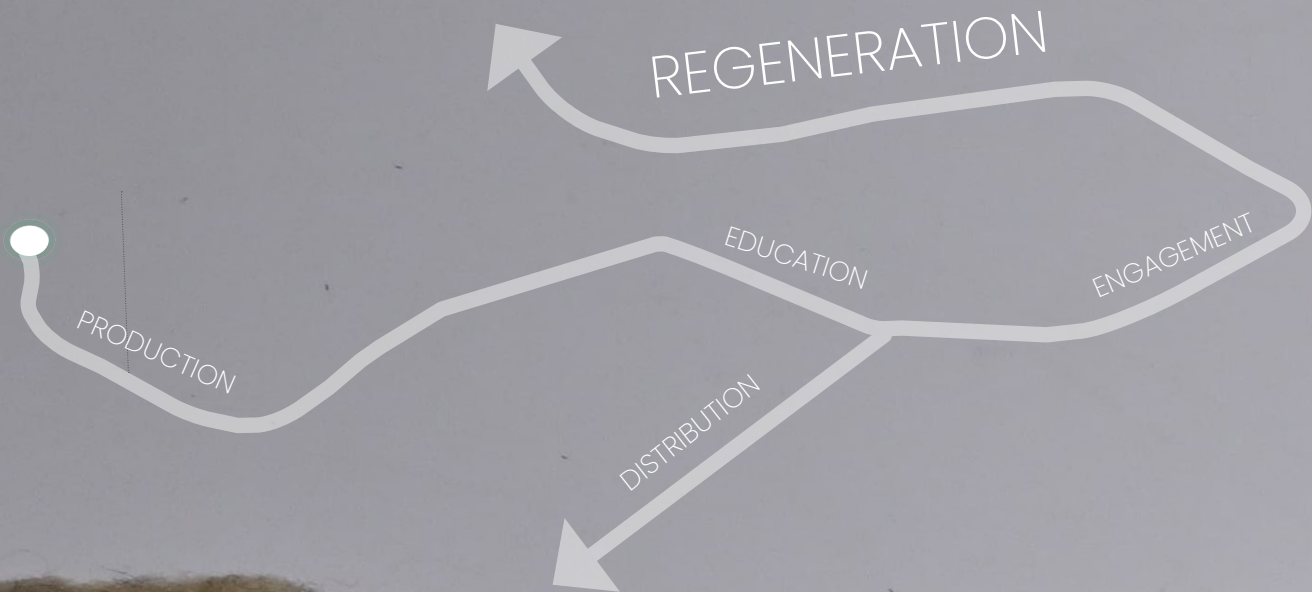
collection rainwater
&
filtering water

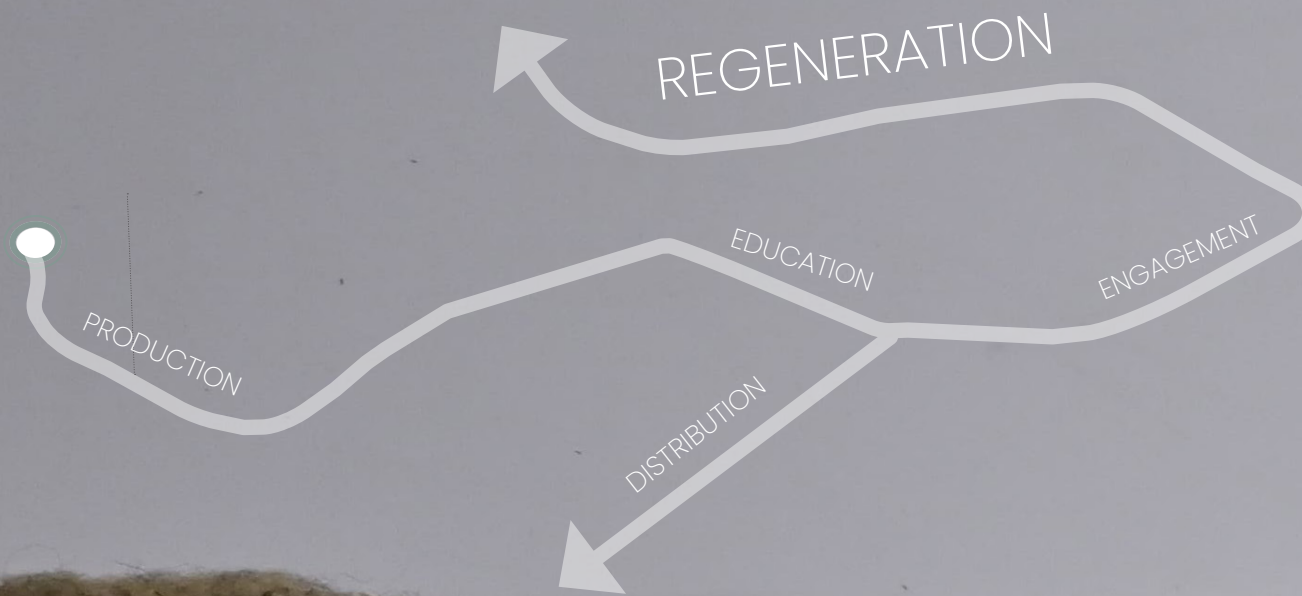


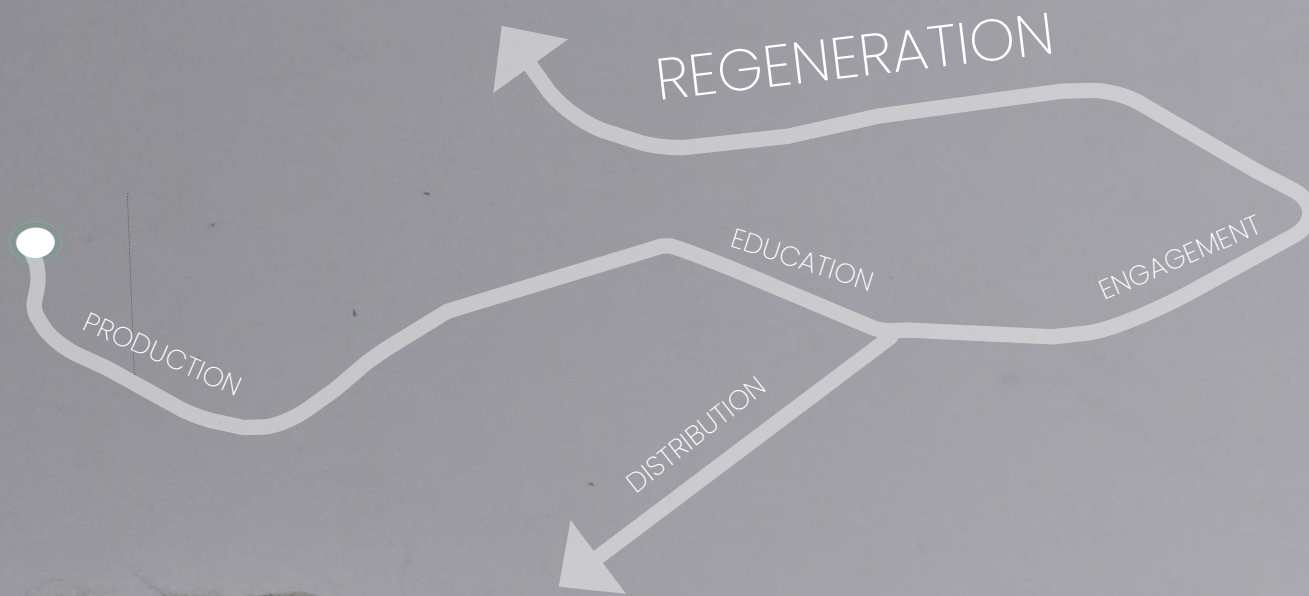
stage 4

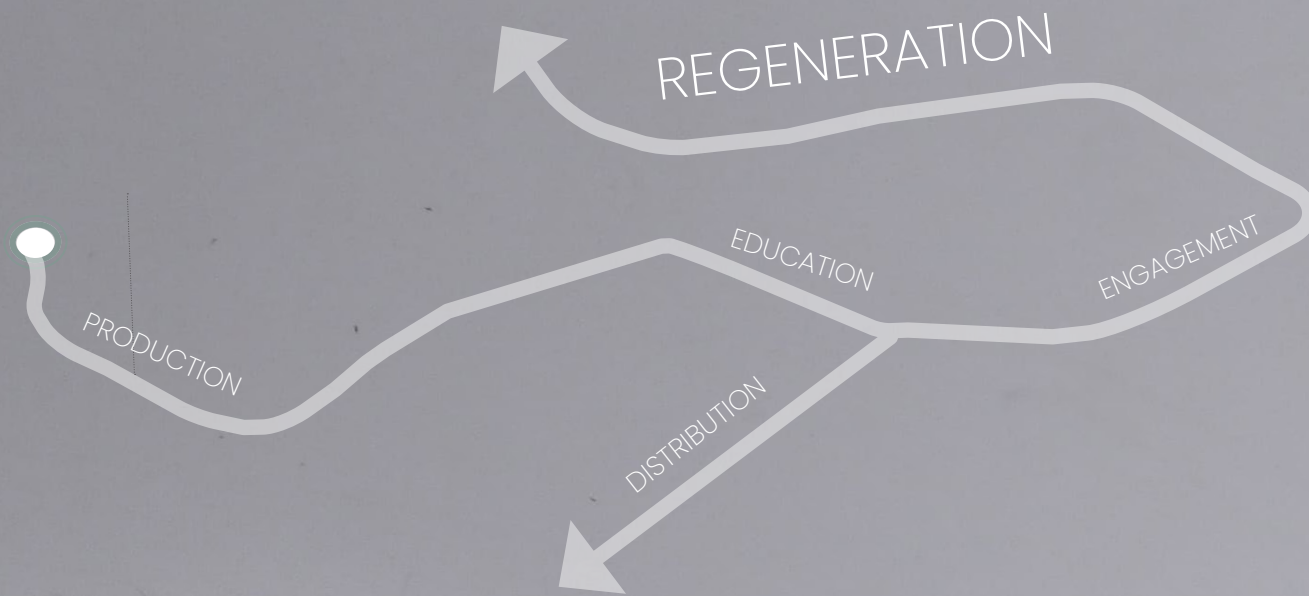
STAGES STRATEGY

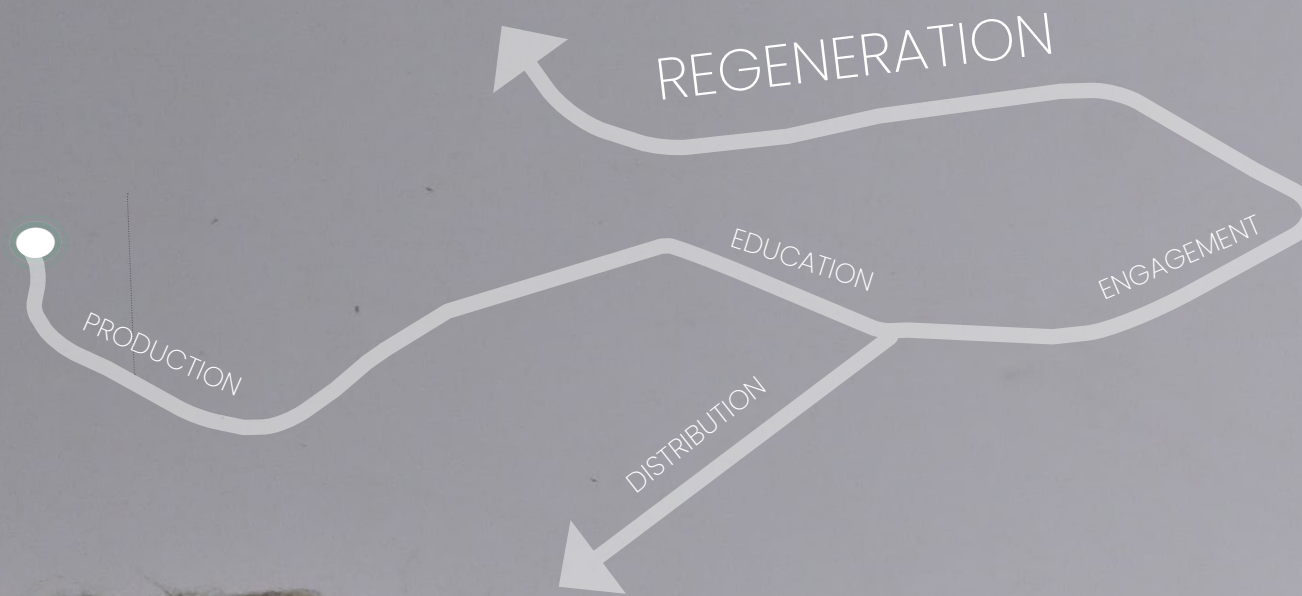
- 0. prepare production chain
- 1. initiate production facility
- 2. manage and upscale production
- 3. educate self-builders
- 4. connect community**
- 5. improve the system and innovate
- 6. spread of housing
- 7. downscale production











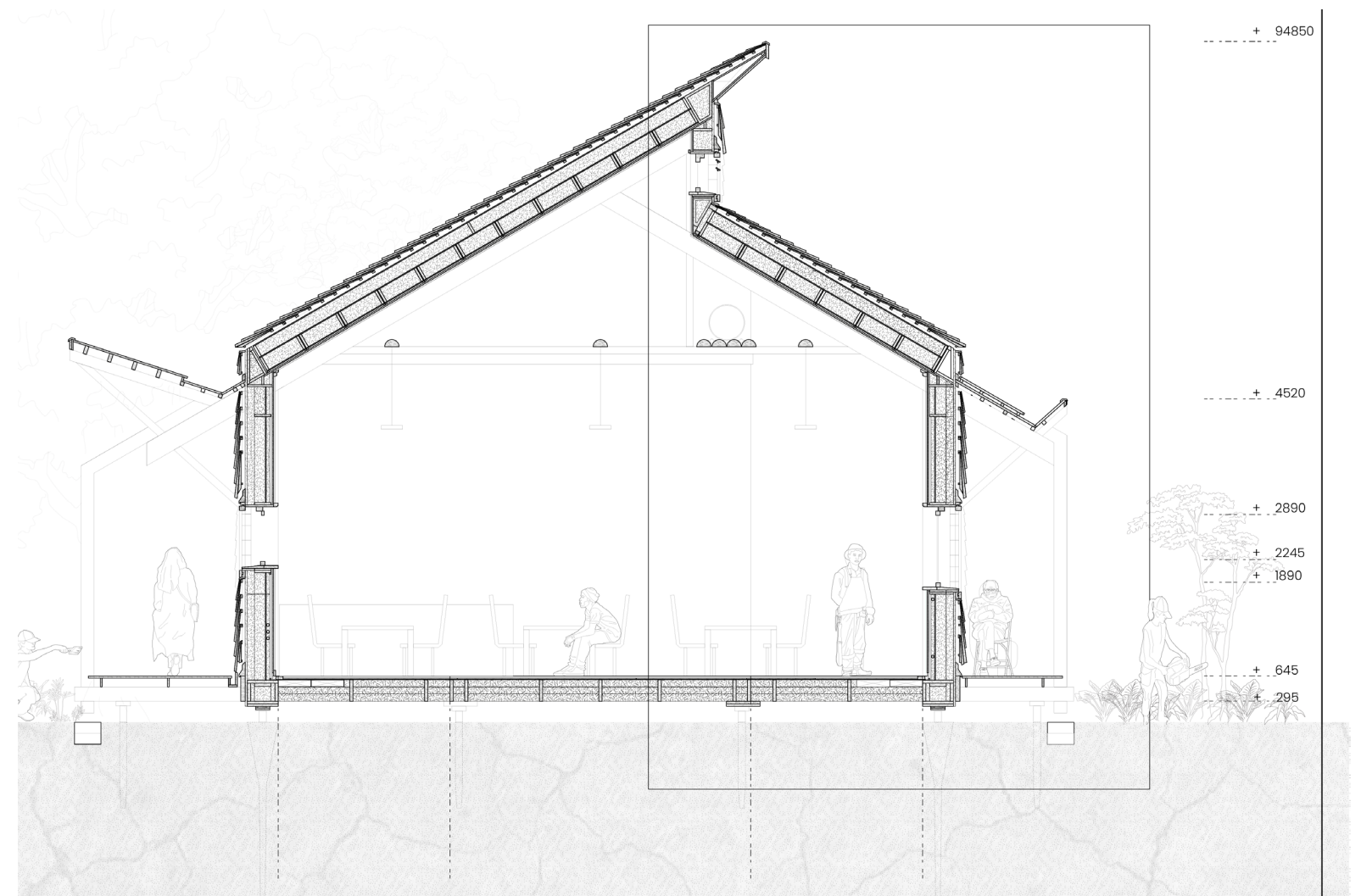
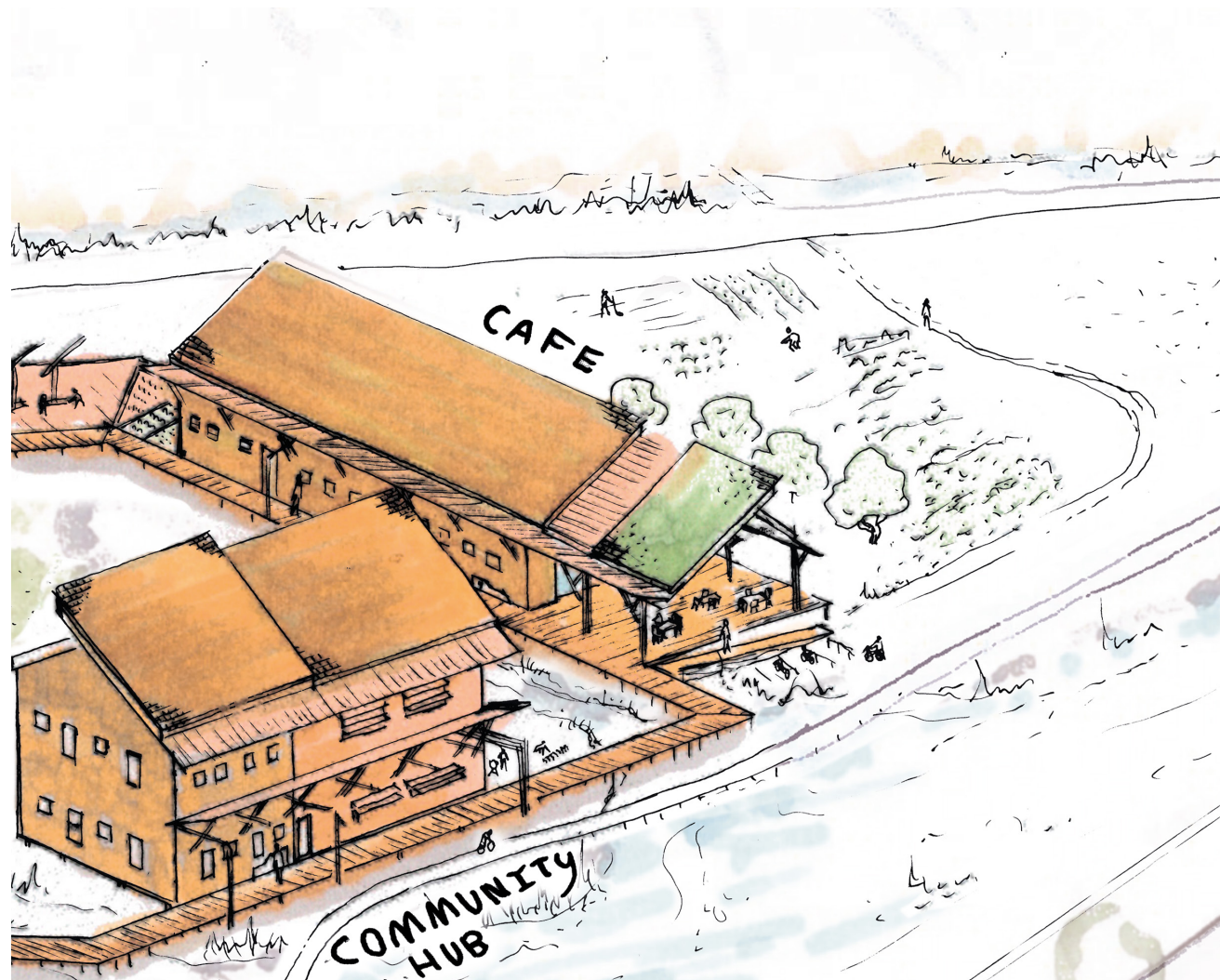


community hub



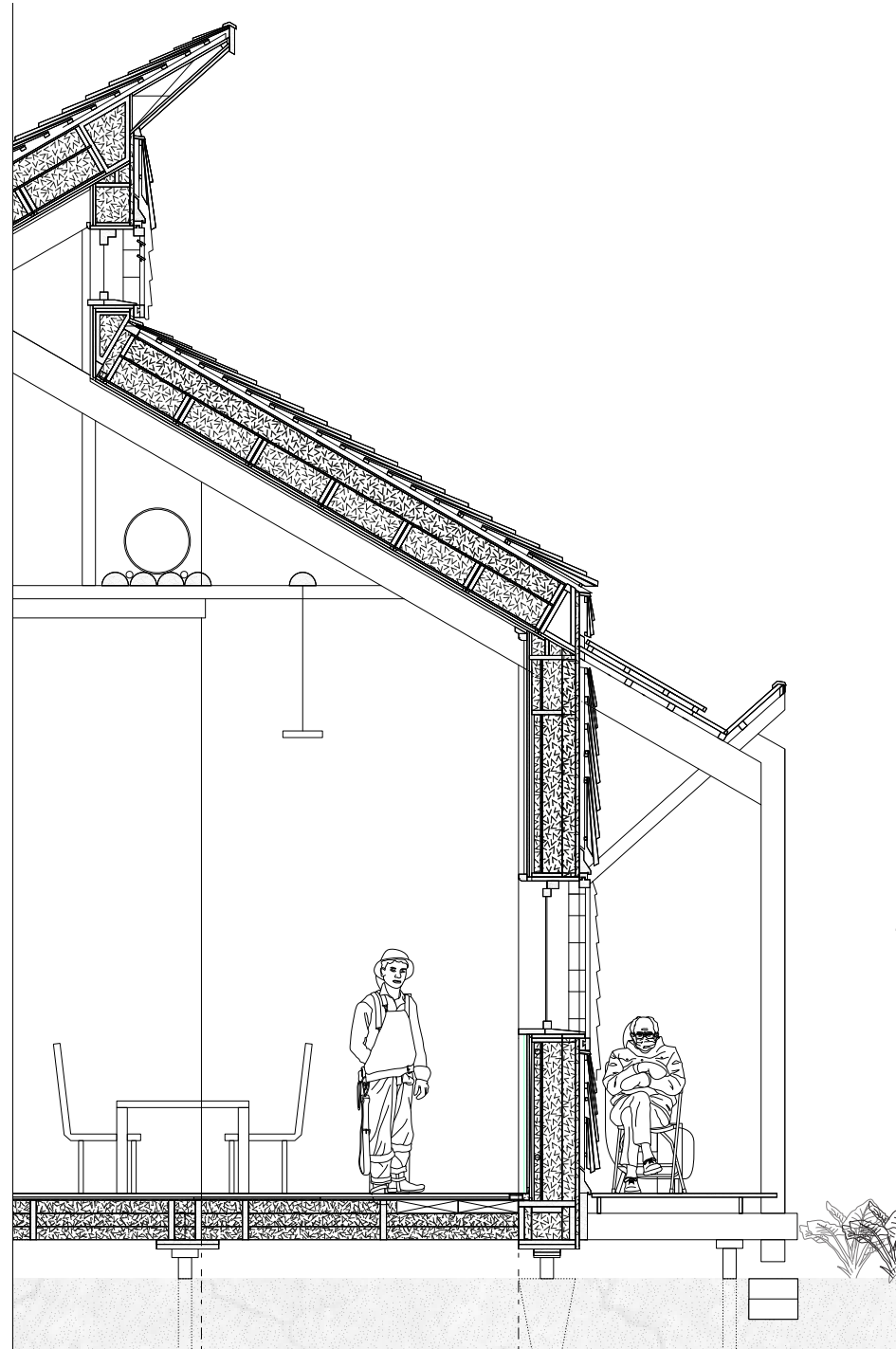
workshop hall community hub

cafe



section cafe

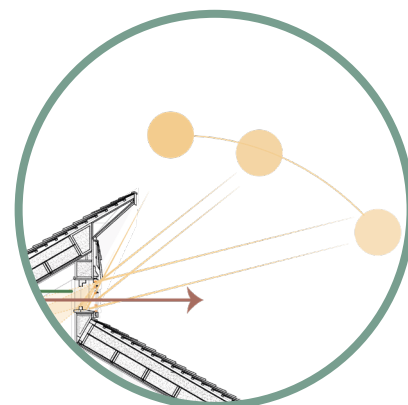
cafe



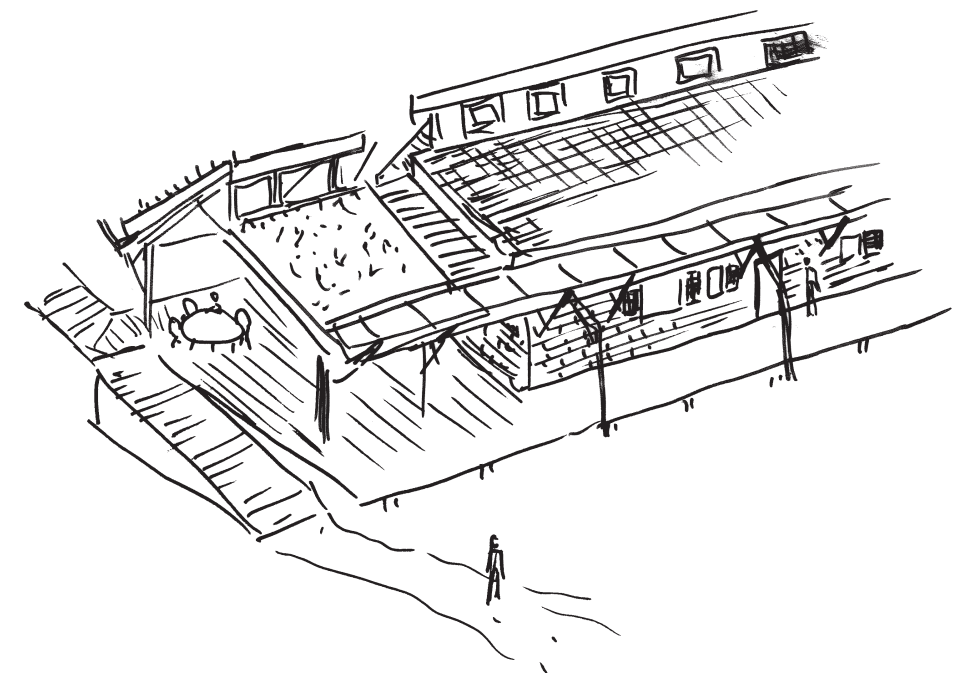
adobe brick core & willow wickerwork



birch bark waterproofing coating



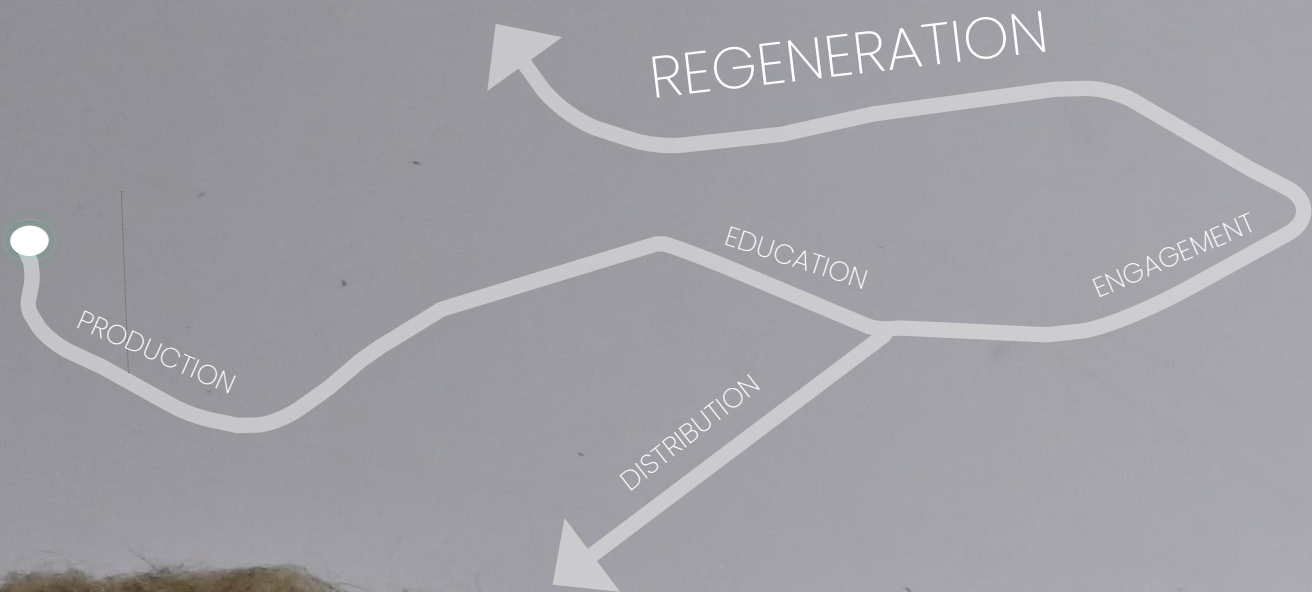
shutters

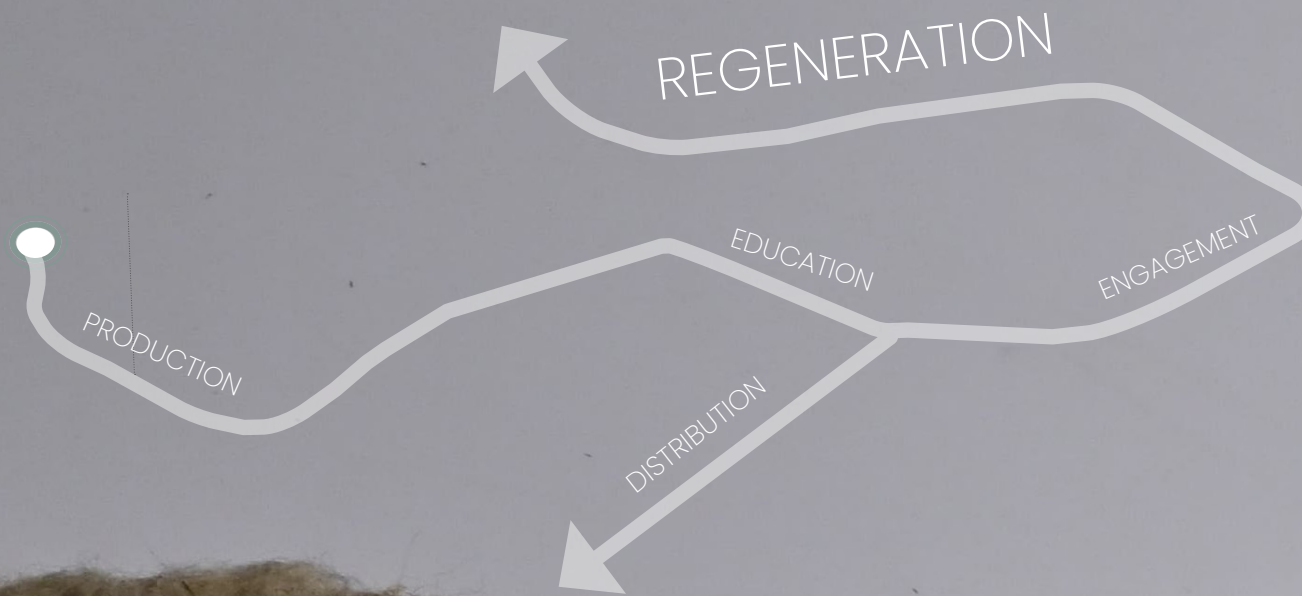


stage 5

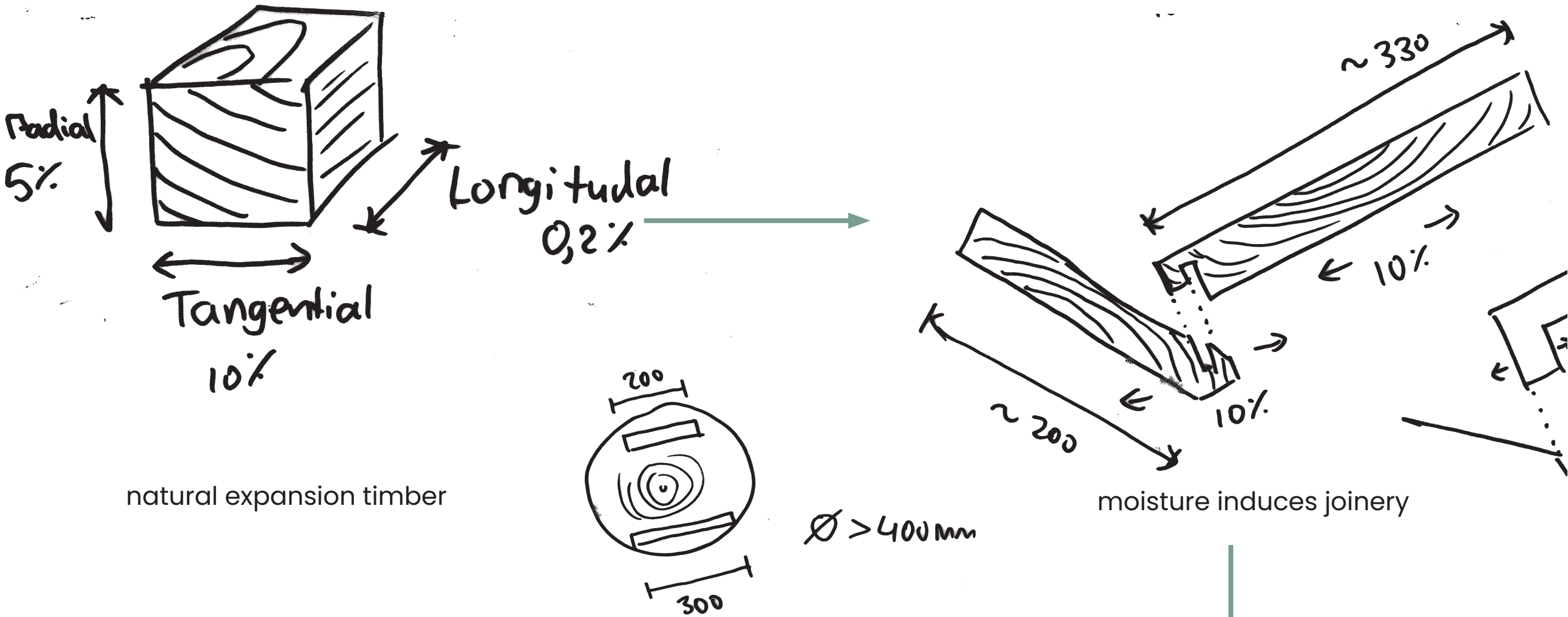
STAGES STRATEGY

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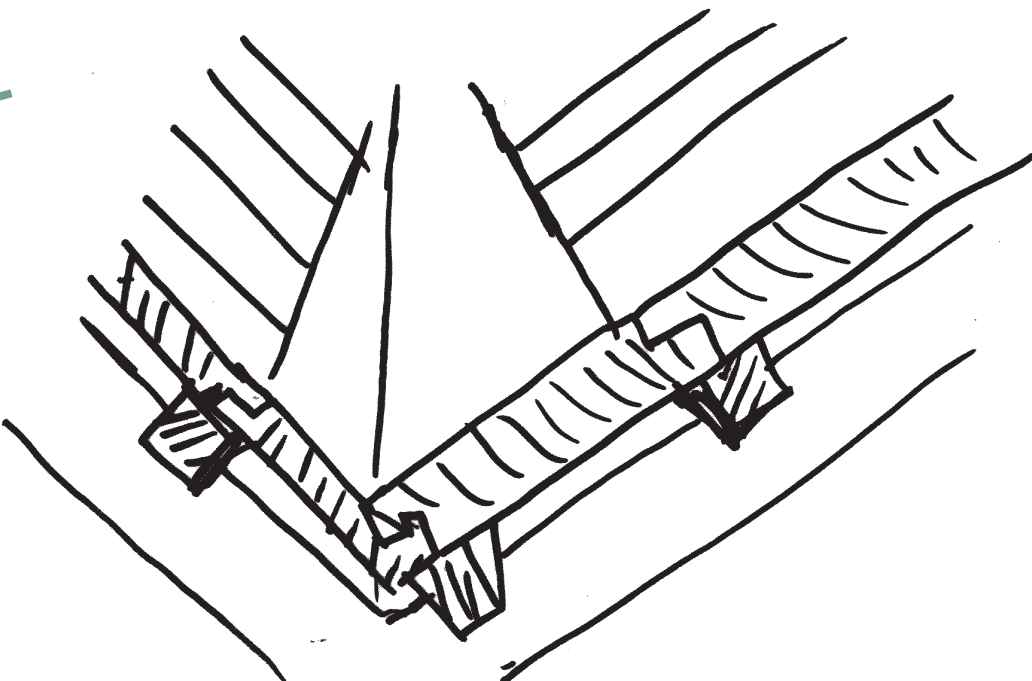
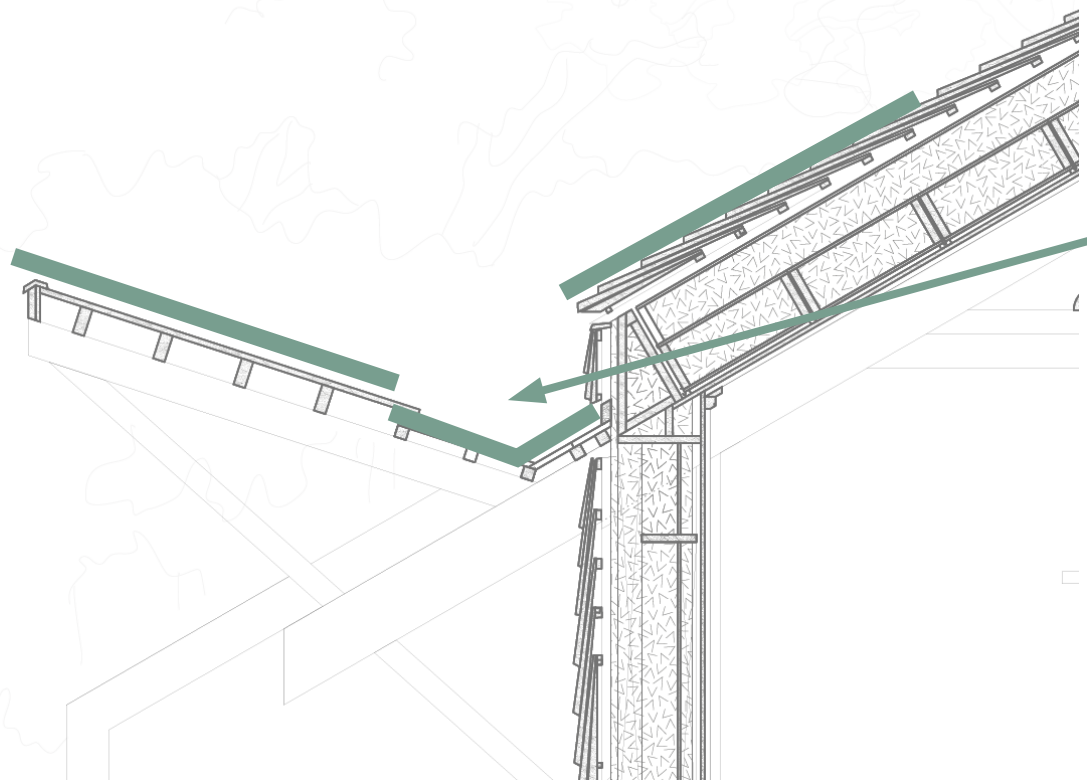


prefabrication



natural expansion timber

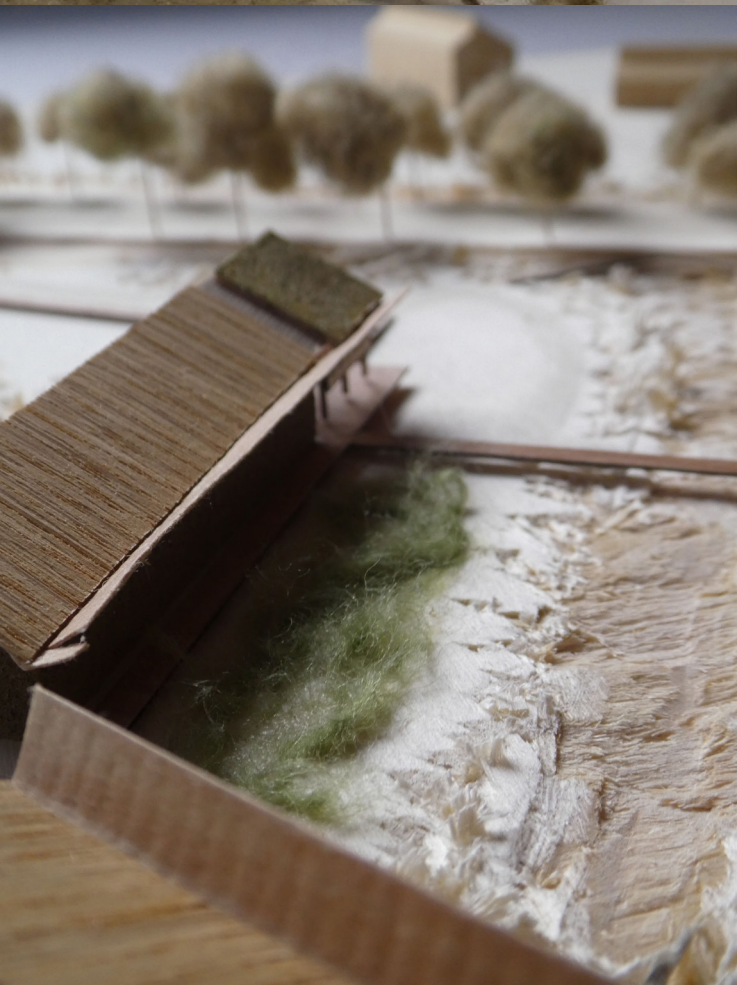
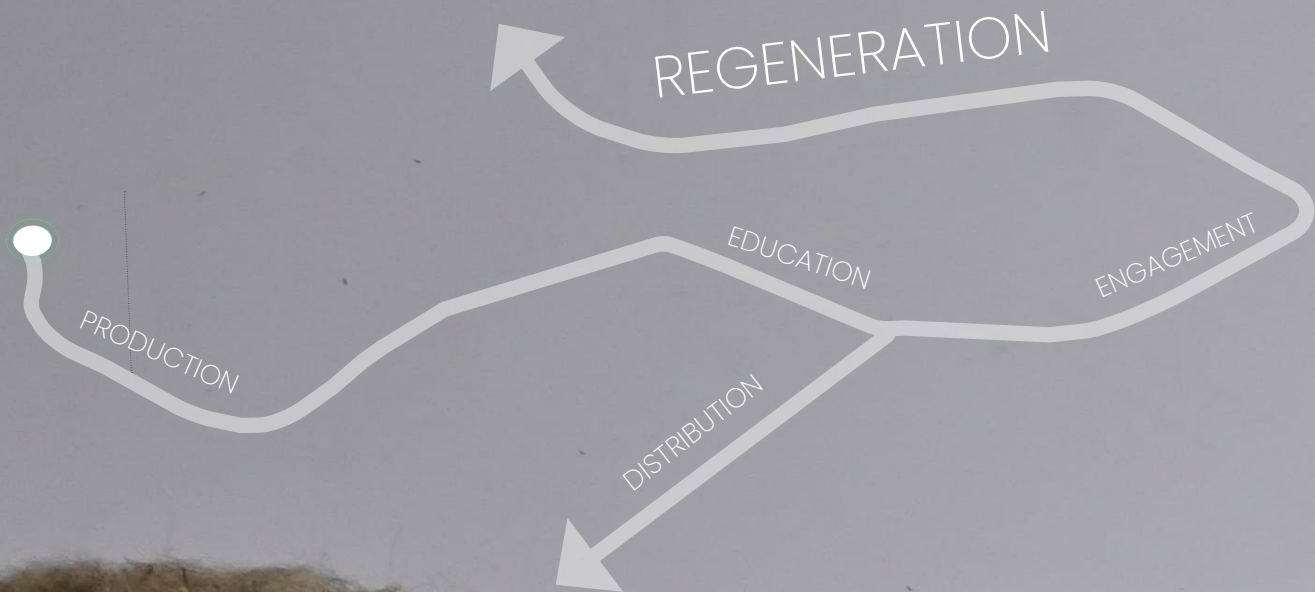
moisture induces joinery



stage 6

STAGES STRATEGY

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- 7. downscale production



housing building system

design guidelines building system:

- simple system
- accommodate technical functionalities
- allows variety
- customizable (to future needs)
- grows with time

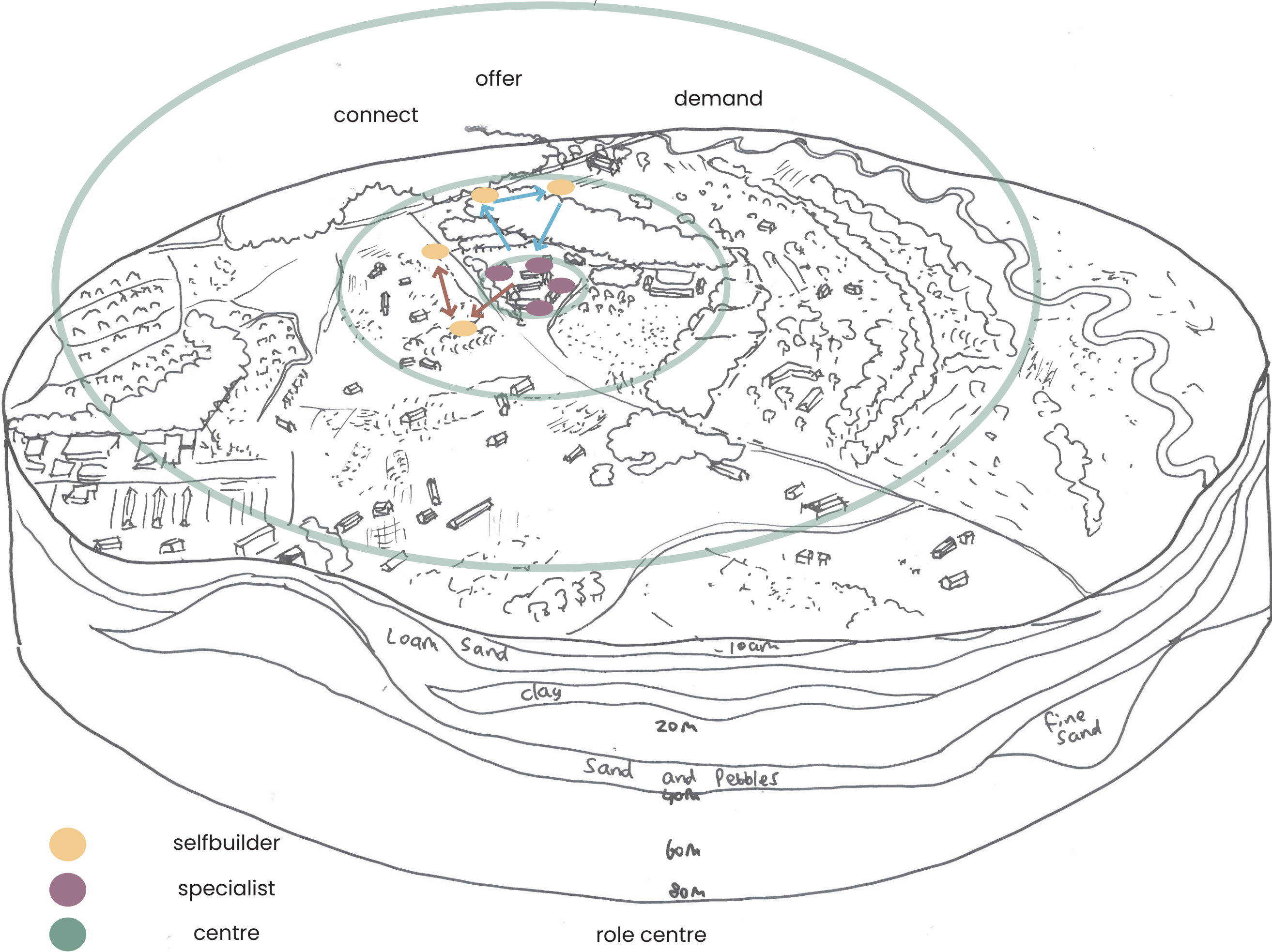
freedom building system

- improve process, joinery & new materials
- custom demands means new technical challenges
- fit heating installations to available source

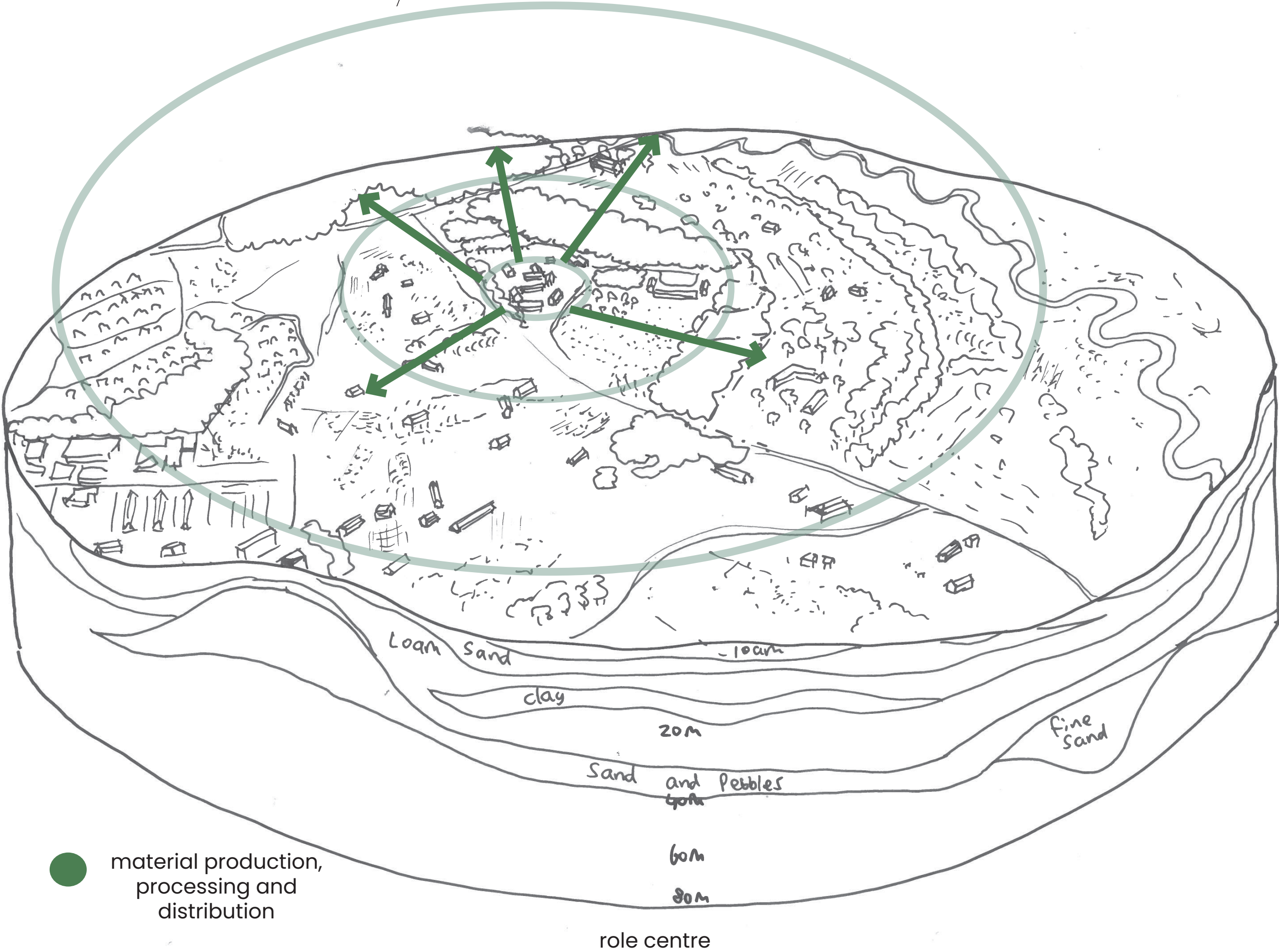
core building system

Freedom in building system

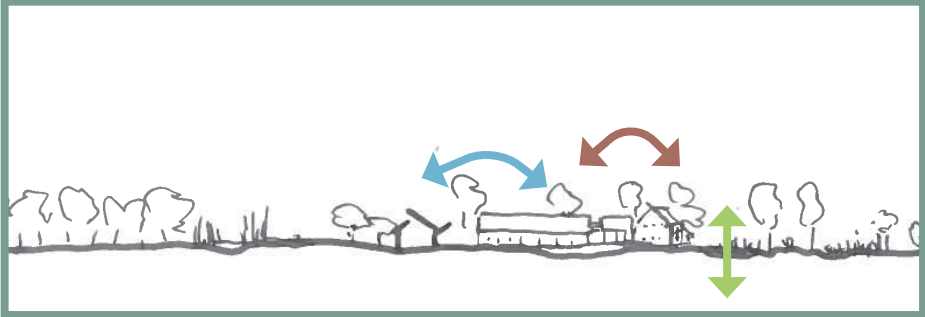
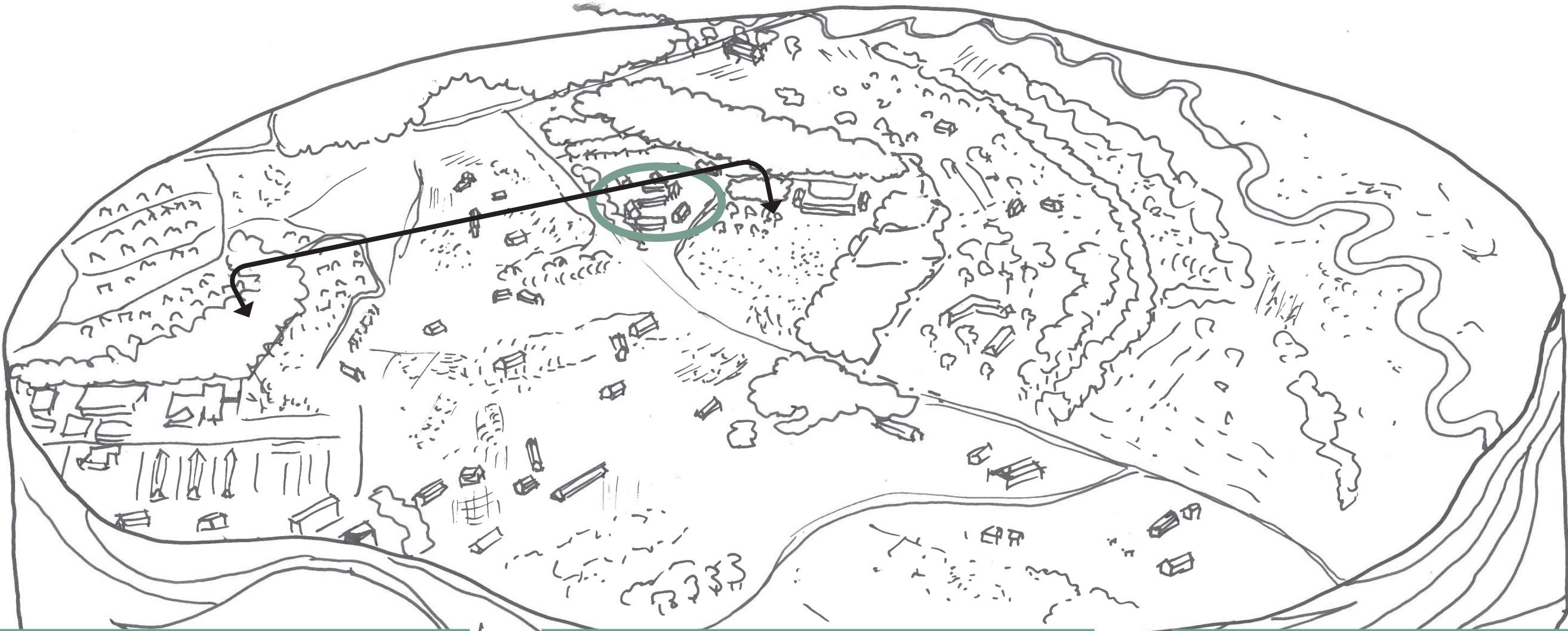
urban vision: socio-educational system



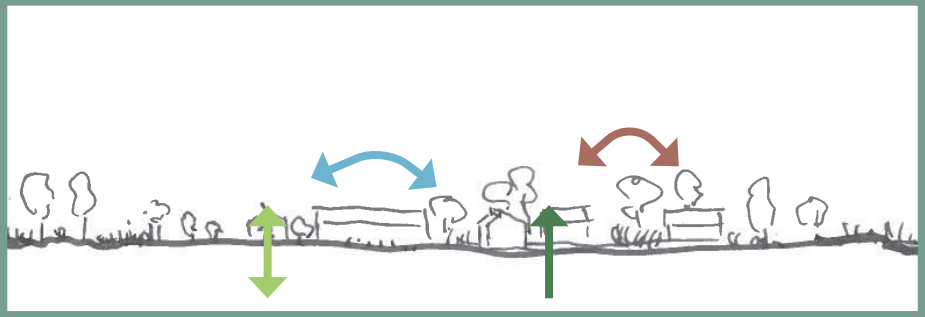
urban vision: material system



urban vision



improve soil and water quality through a gradient landscape



selfbuild community regenerates land, grows materials, educates and engages



blend border landscpae in height and material

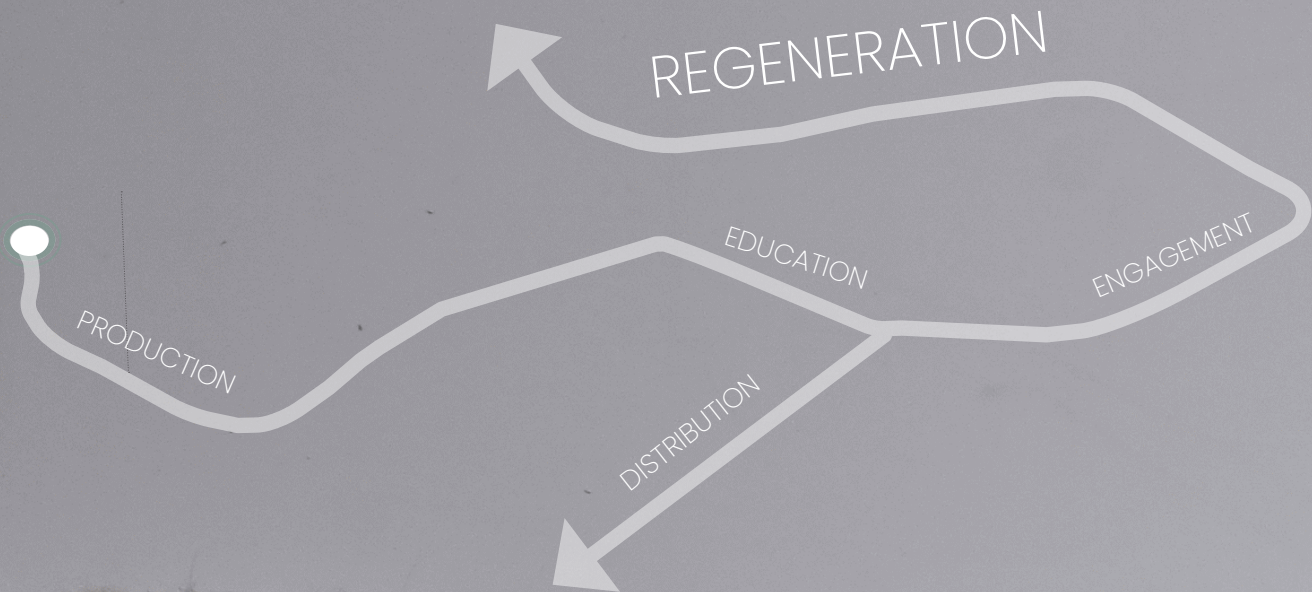




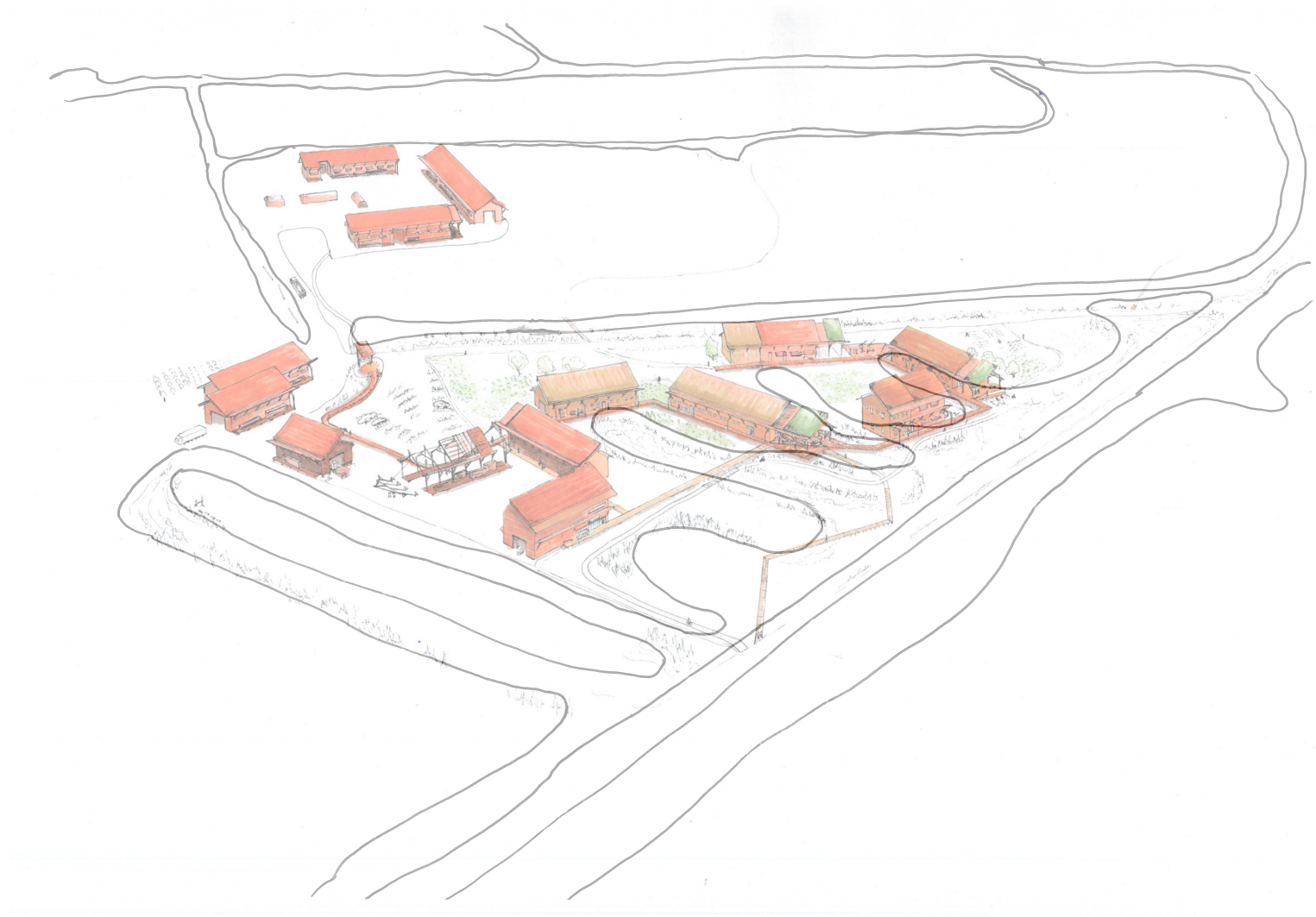
stage 7

STAGES STRATEGY

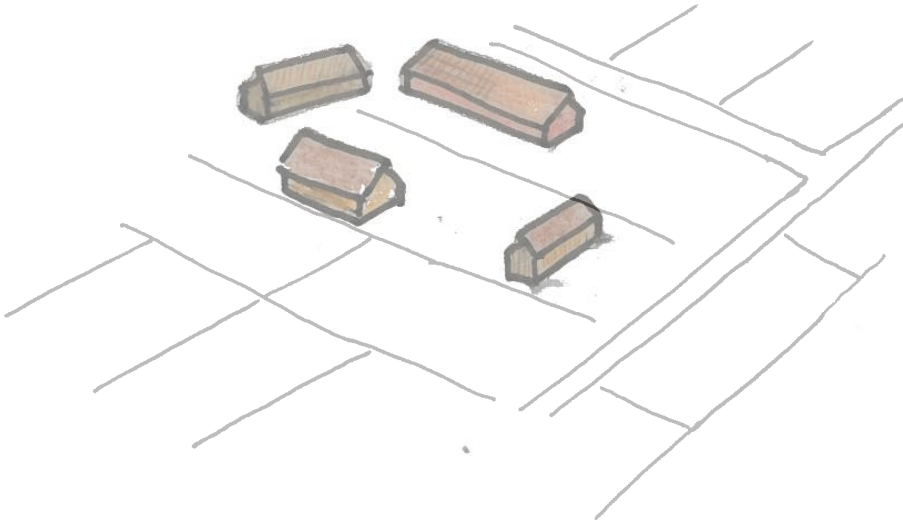
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applicability of the concept



Drenthe as a context



different context, different result

