



Koen Vogel, Sil Dijkman & Leon Peters

# BLUE- GREEN ROOFS



# DEMONSTRATORS

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# AGENDA

- Green roof objectives
- How it works
- Design process
- The physical demonstrator
- The virtual demonstrator
- Future plans



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# BLUE-GREEN (BG) ROOF GOALS

- Biodiversity
- Perseverance of animals & insects
- Carbon offsetting
- Self-sustaining
- Recreational
- Flood prevention
- Natural building insulation

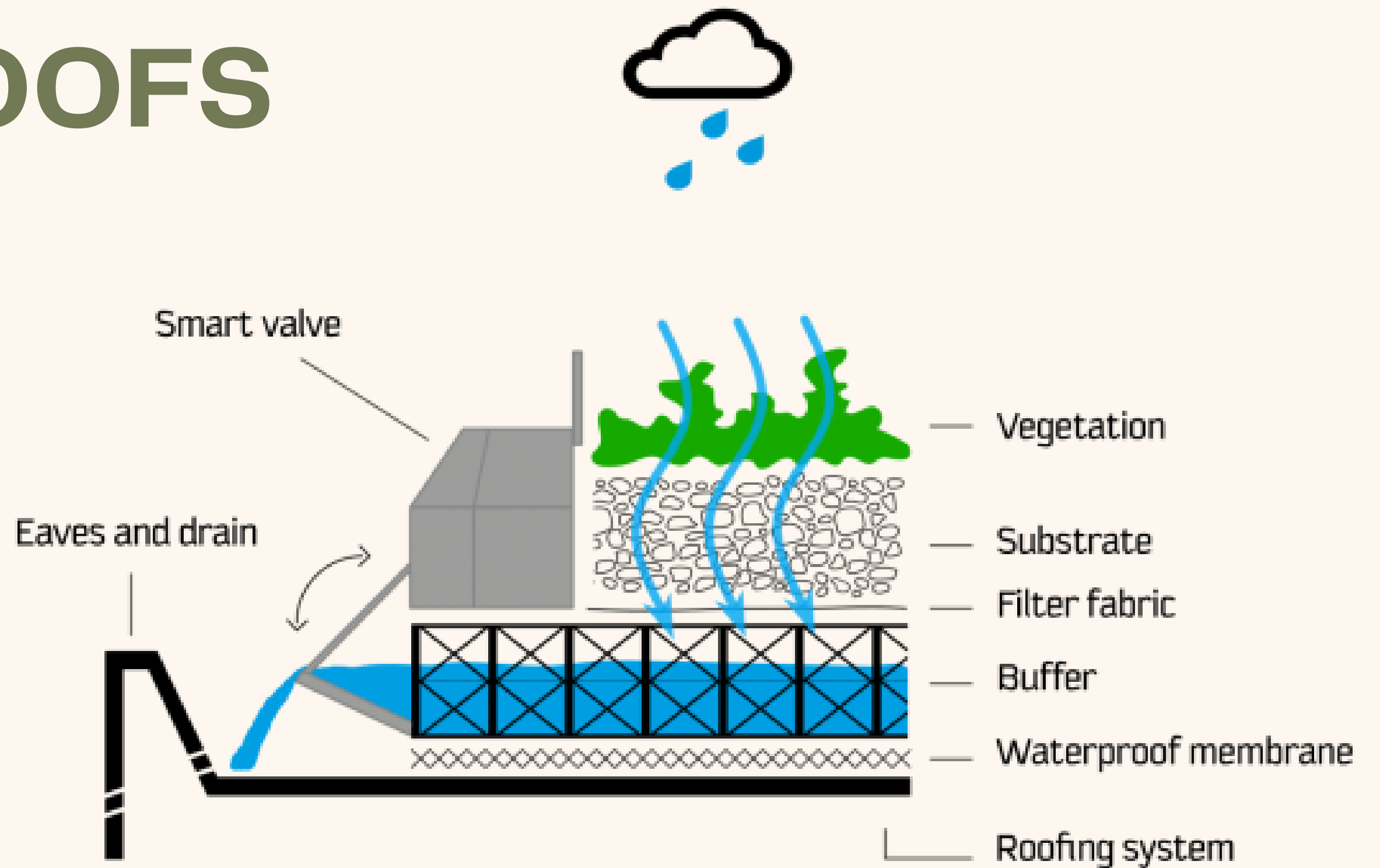
## GOAL OF THIS PROJECT

- Encourage discourse
- Speculate on possible solutions for LILa

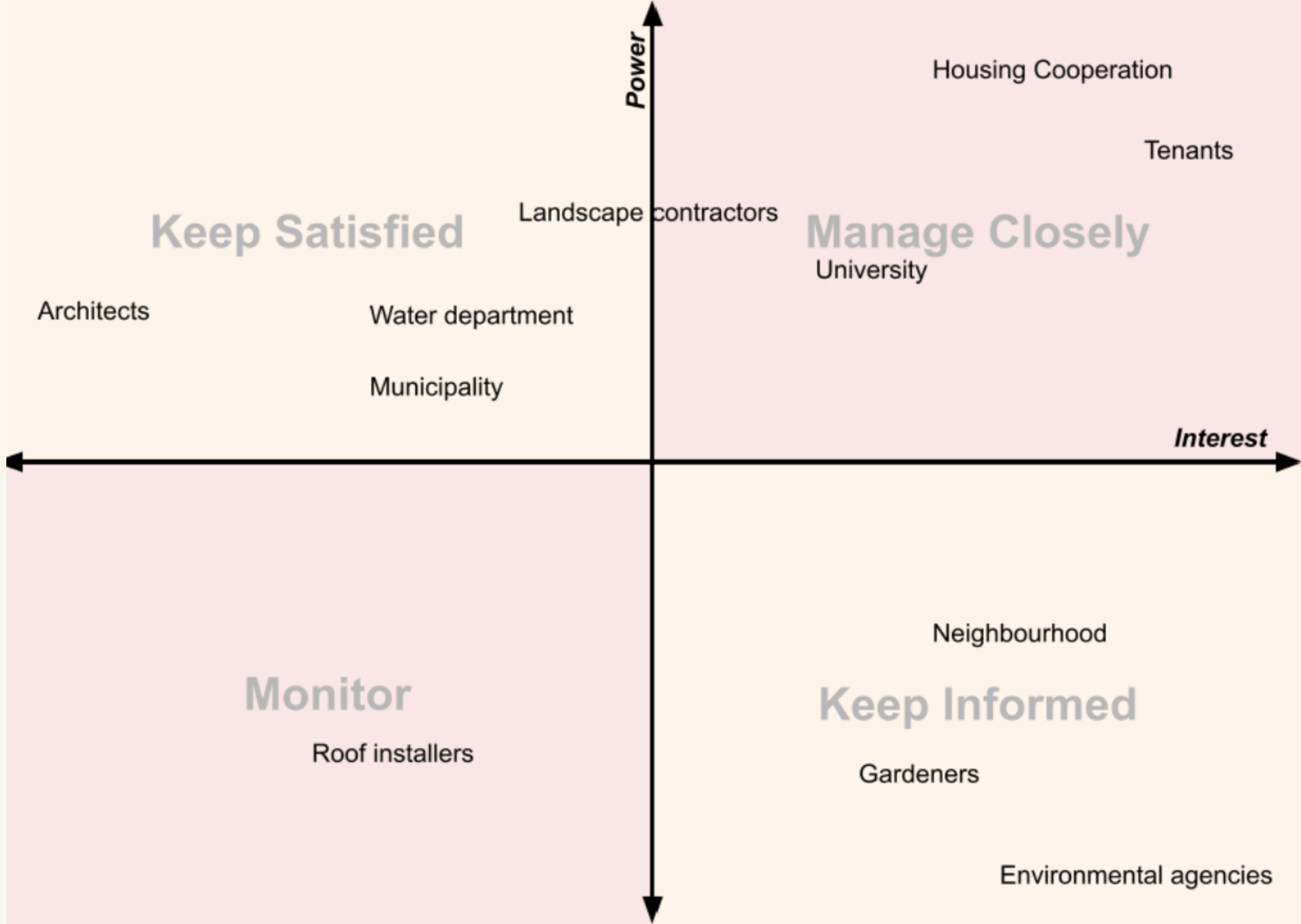


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# HOW BG ROOFS WORK



# STAKEHOLDER ANALYSIS



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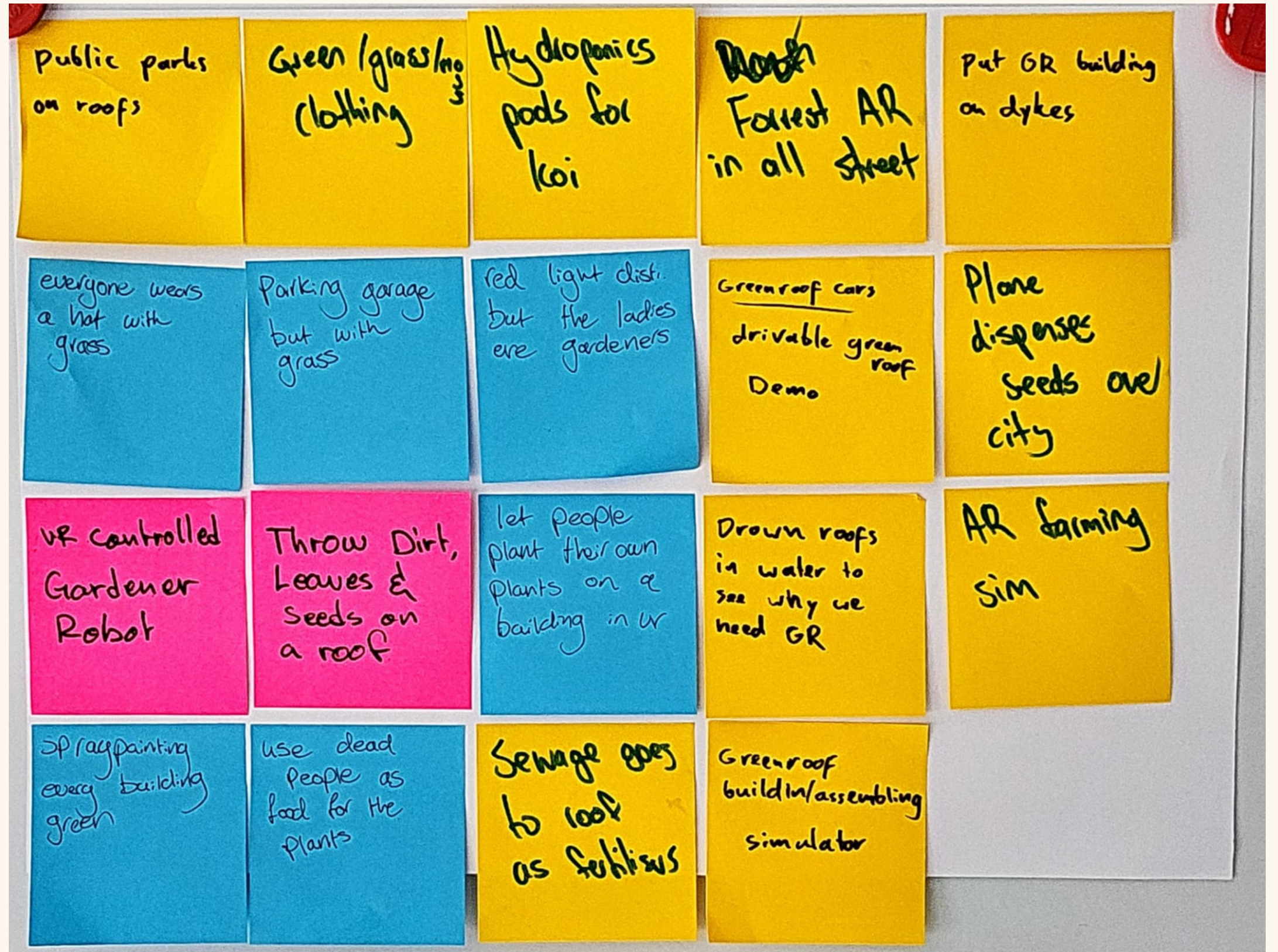
# **THE PROCESS**

## **from ideation to conceptualisation**



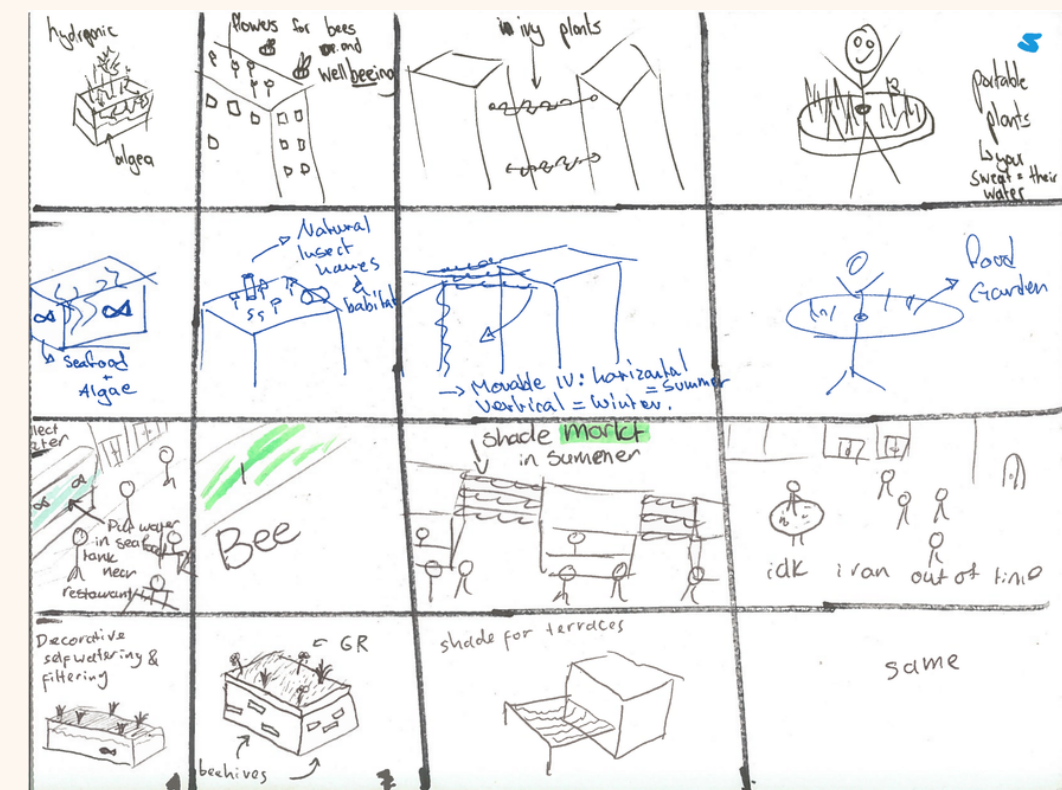
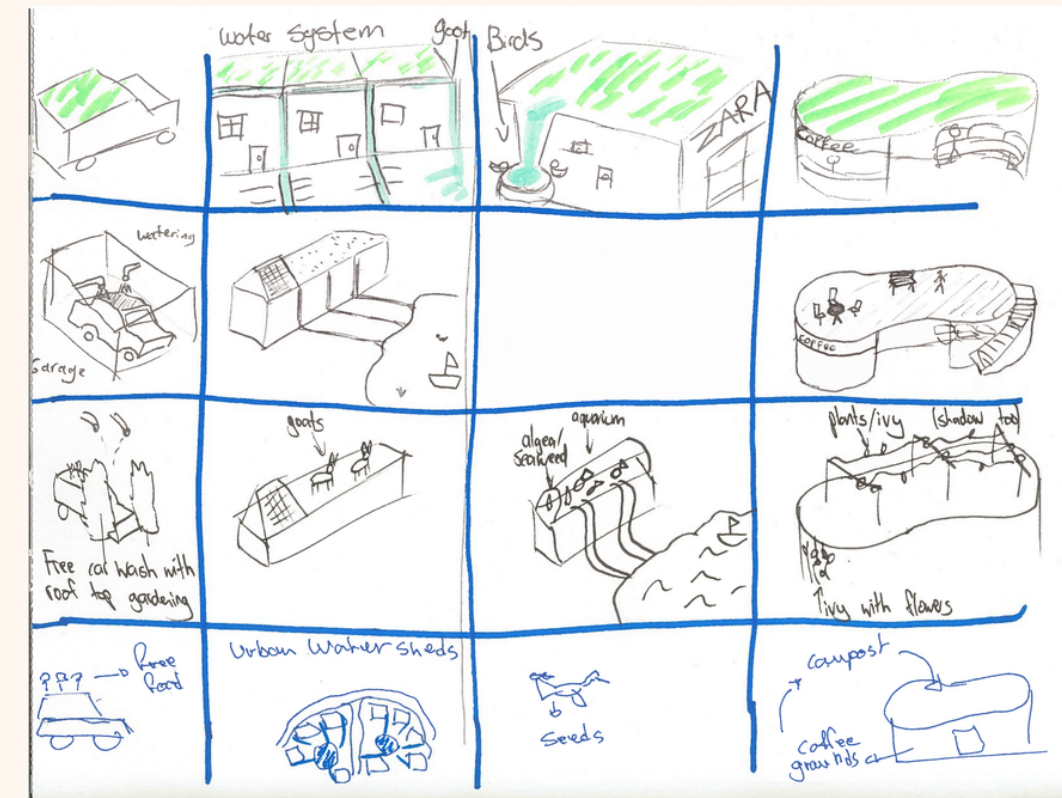
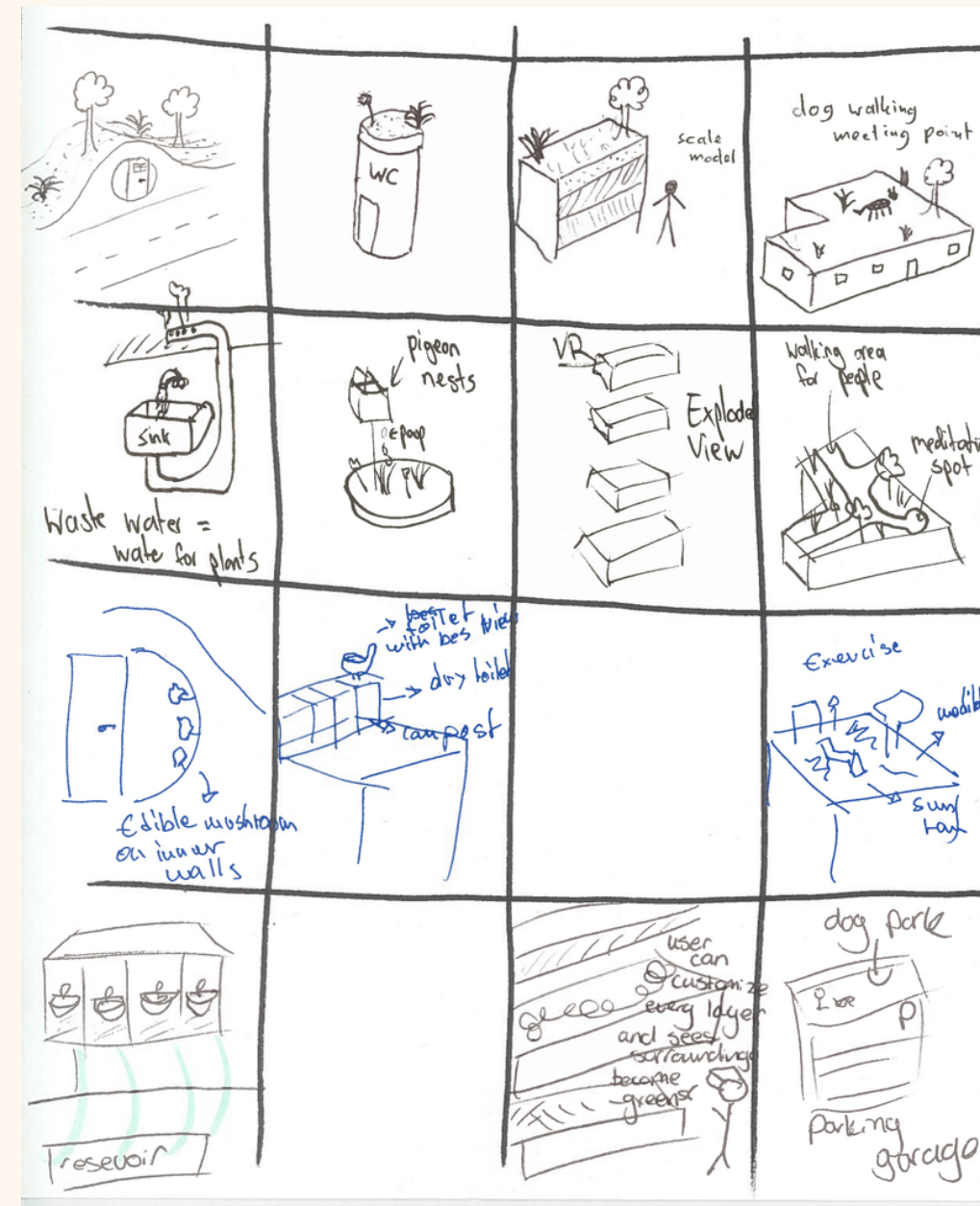
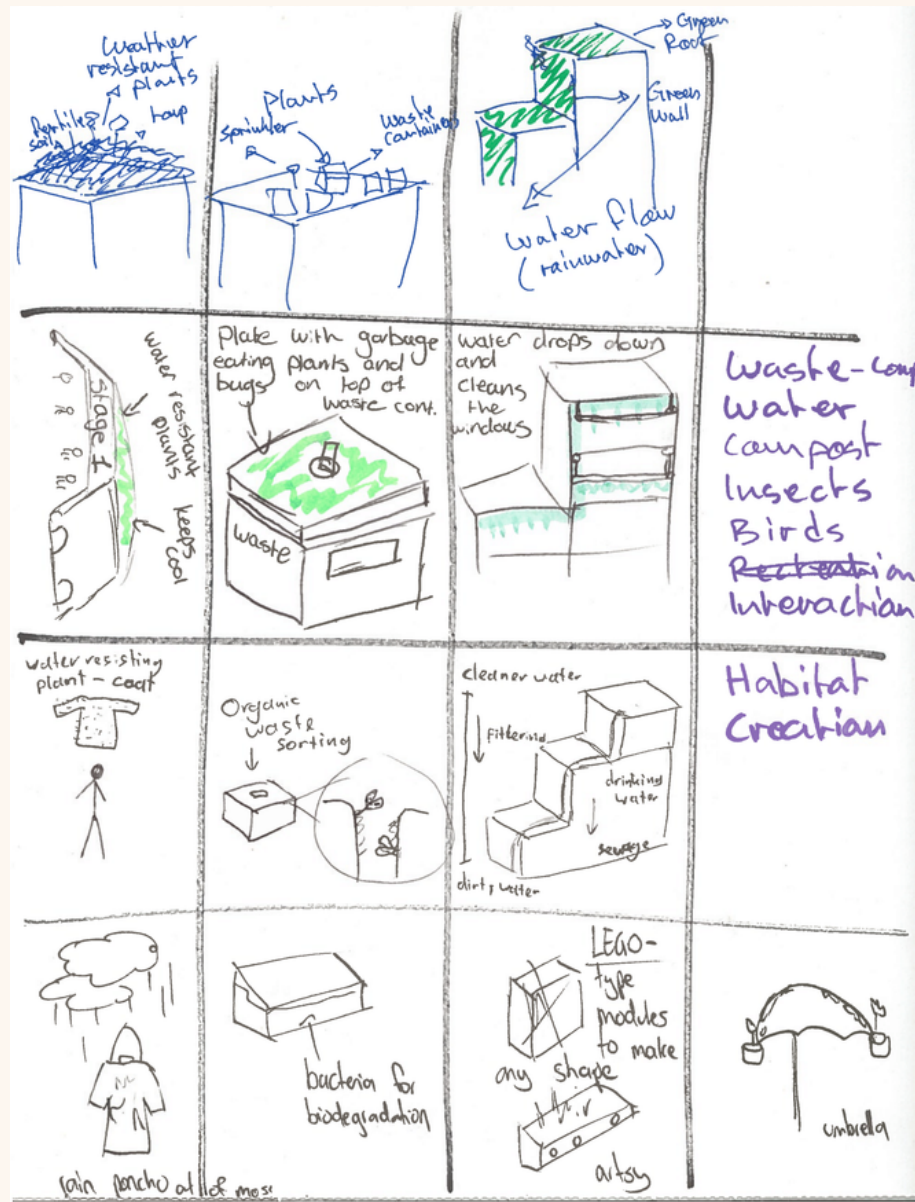
# IDEATION

## REVERSE THINKING



# IDEATION

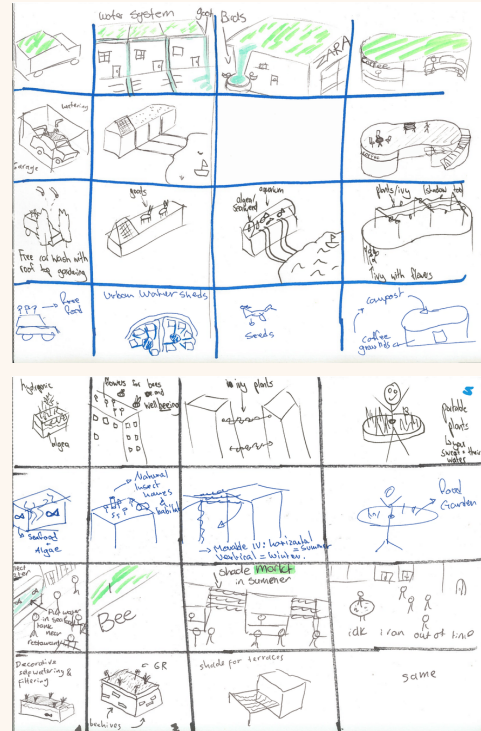
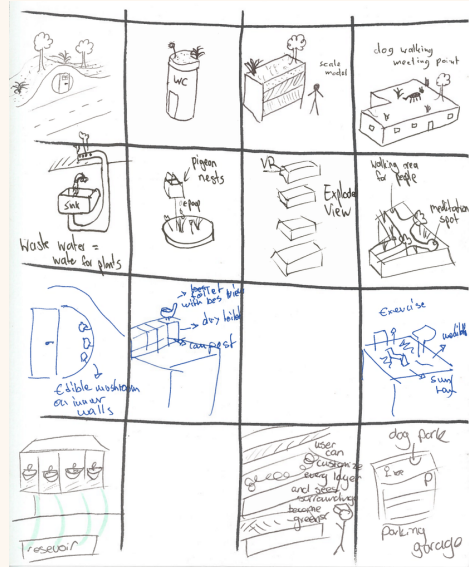
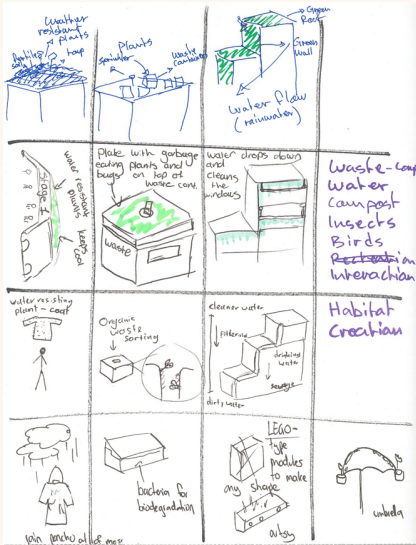
## BRAINDRAWING



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# IDEATION

## BRAINDRAWING



## THEMATIC ANALYSIS

- Composting/filtering of waste
  - Green roof for edible foods
  - Recreational green areas in concrete jungle
  - Hydroponics
  - Flora and Fauna
  - Rain water harvesting
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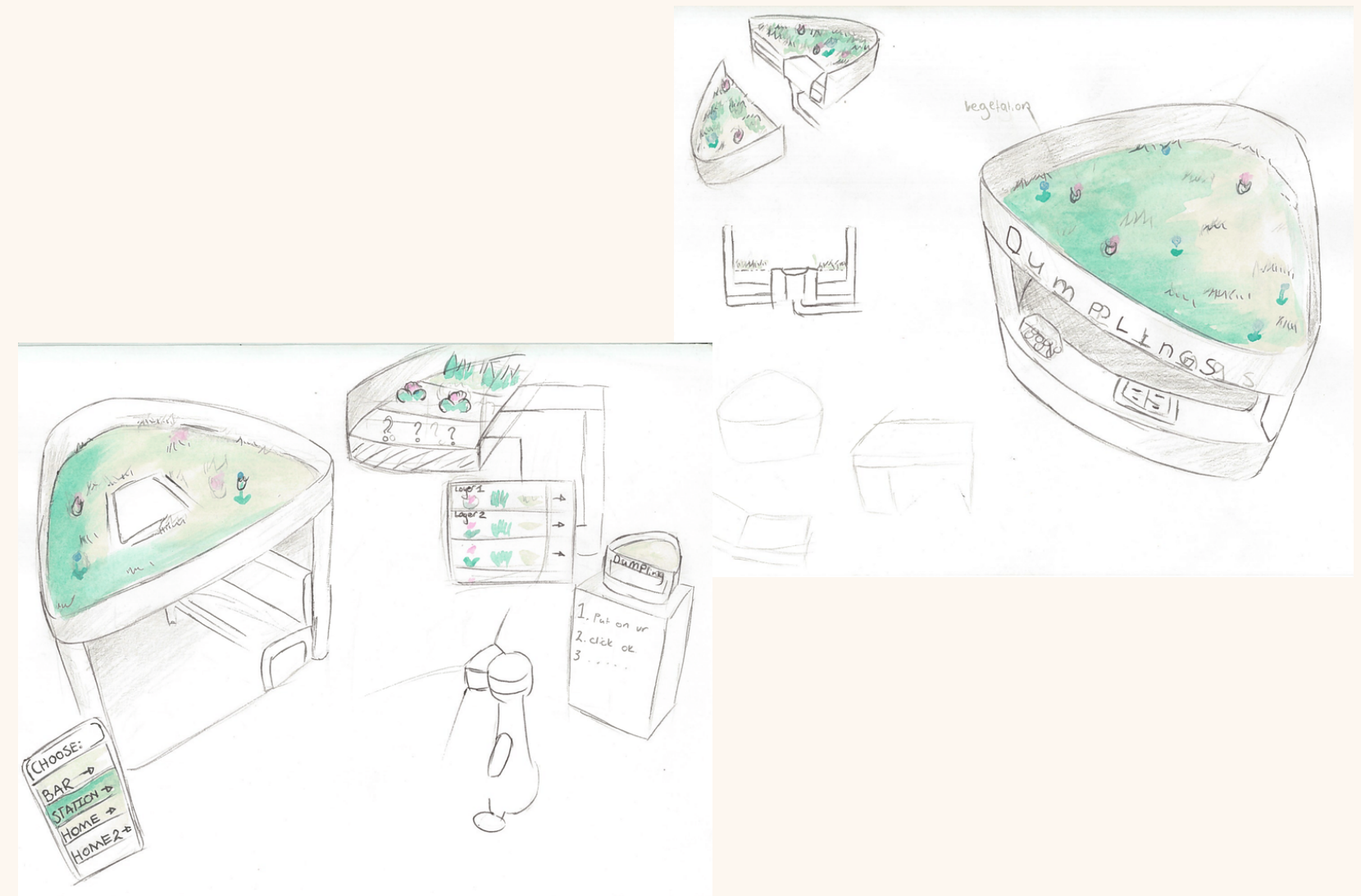
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# CONCEPTUALISATION

## CONCEPT

- Hydroponics
  - Algae
  - Rain water harvesting (reduce flood peaks)
  - Irrigation system into sewage
- Bees and insect habitats
- Human interaction for wellbeing
  - Provide additional shade in cities

## SKETCHES



# CONCEPTUALISATION



## SKETCHES



# CONCEPTUALISATION

## Preliminary List of Requirements



	AR/VR	Physical
Modular	✓	✓
Versatile for any building	✓	✗
Minimal maintenance	✓	✓
Aesthetically pleasing	✗	✓
Positive impact on environment	✓	✓
Carbon positive	✓	✓
For flora and fauna (and humans)	✓	✓

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# APPLICATION SCENARIOS



vs





# THE PHYSICAL CONCEPT

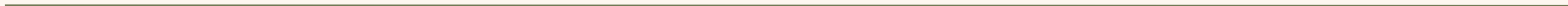
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# THE VIRTUAL CONCEPT

## Digital Twinning

- Should complement the physical model
- provide dynamic information
- Intuitive to use

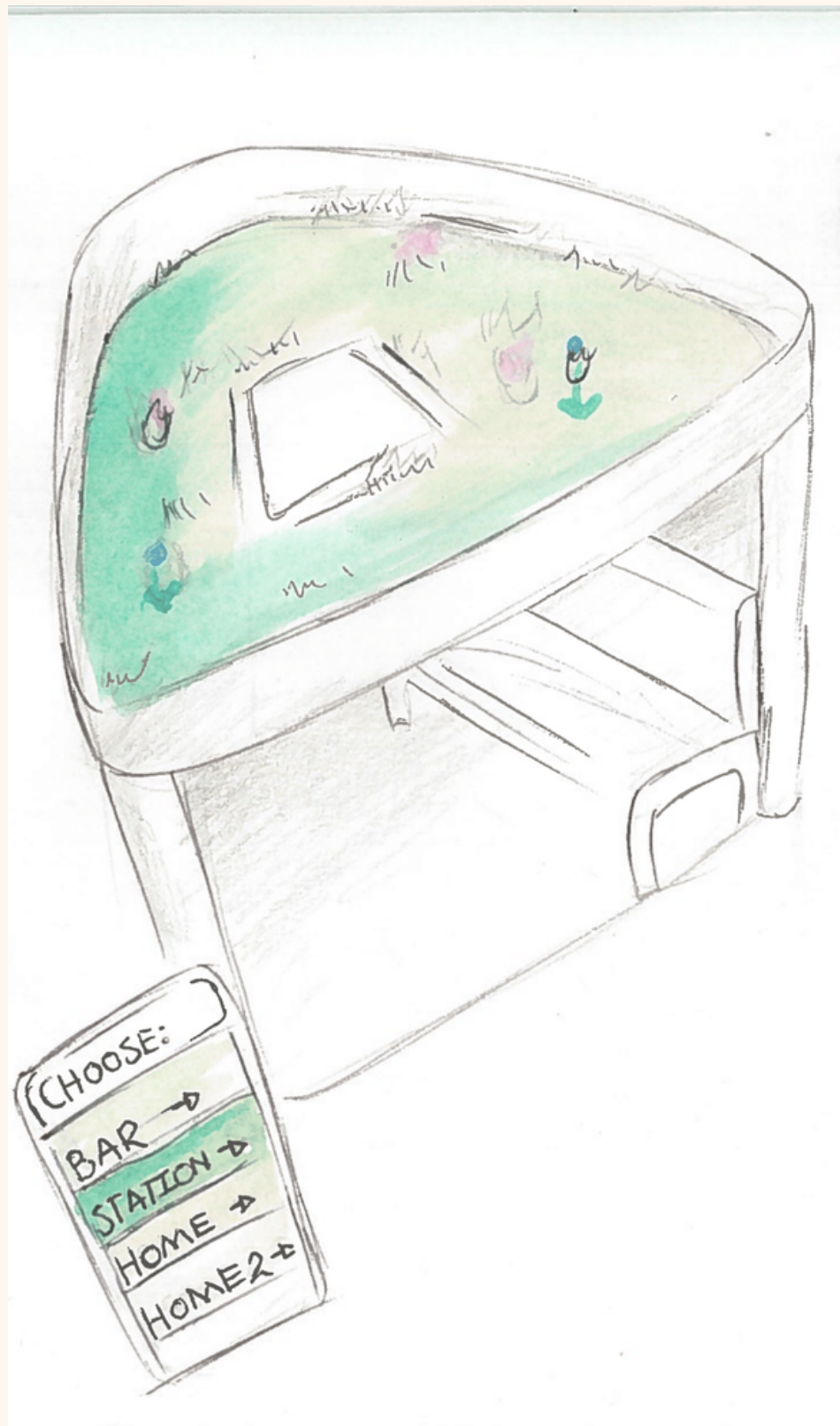


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# AUGMENTED REALITY

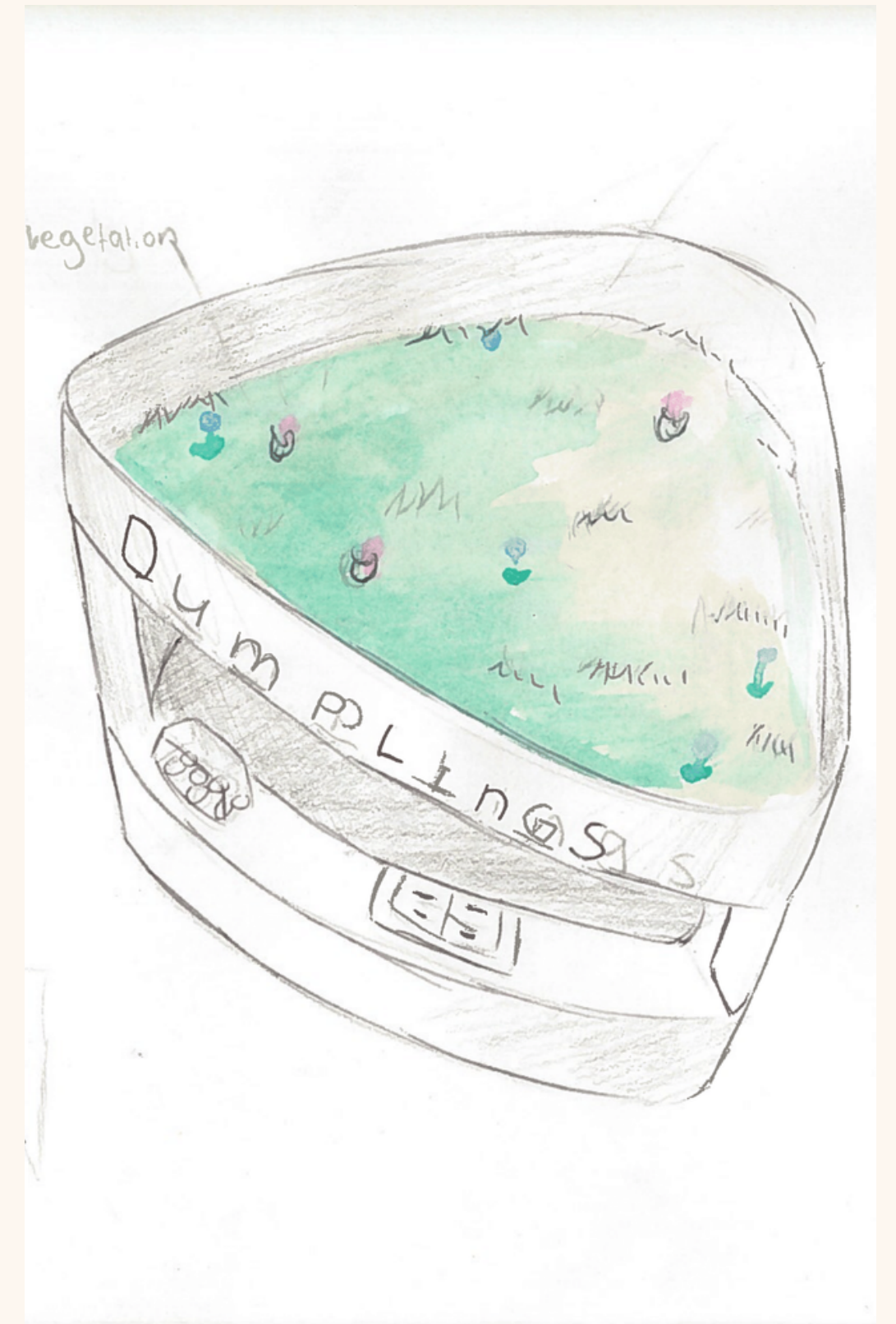
- Passthrough imaging
- Augment physical model
- Overlay information





# MODULARITY

- Swap out roof types
- Swap out buildings



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# GOALS

## 1. THE EXPERIENCE

- Immerse users in the possibilities for green infrastructure of the future
- Walk-through and walk-on Blue-green roof architecture

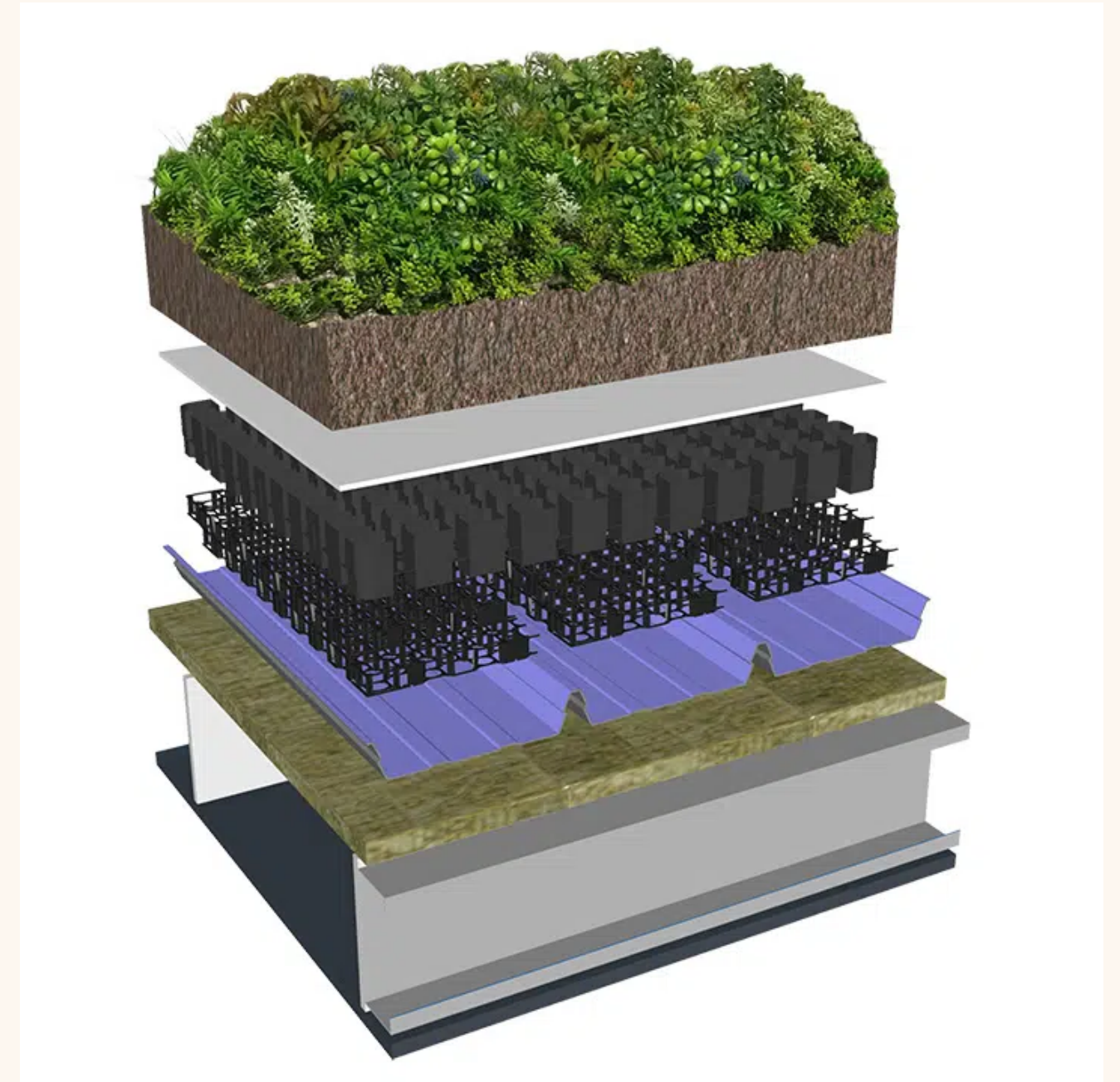


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# GOALS

## 2. INNER WORKINGS

- Exploded view of the different layers of a GR module
- What makes the drainage system work

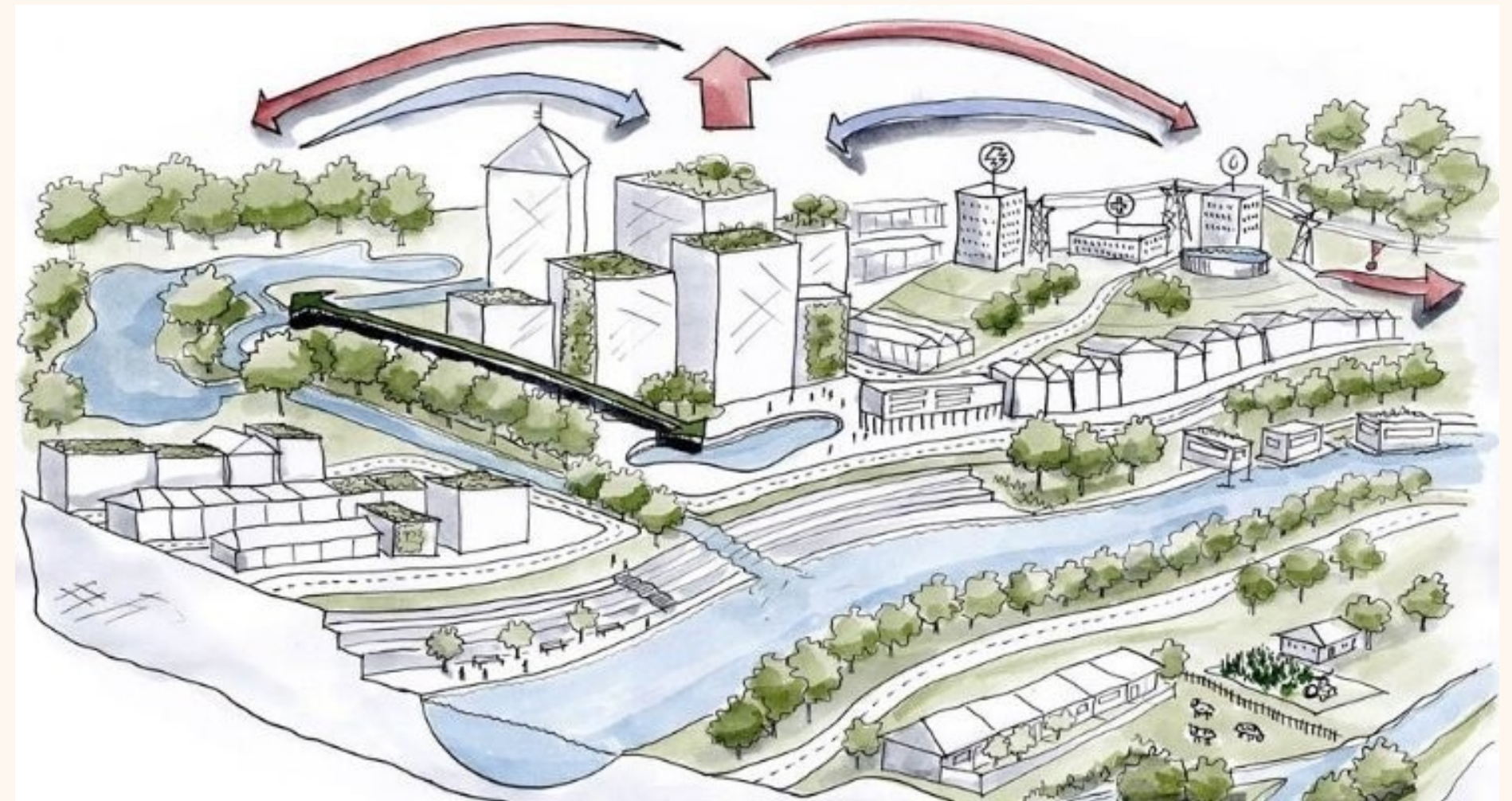


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# GOALS

## 3. IMPACT

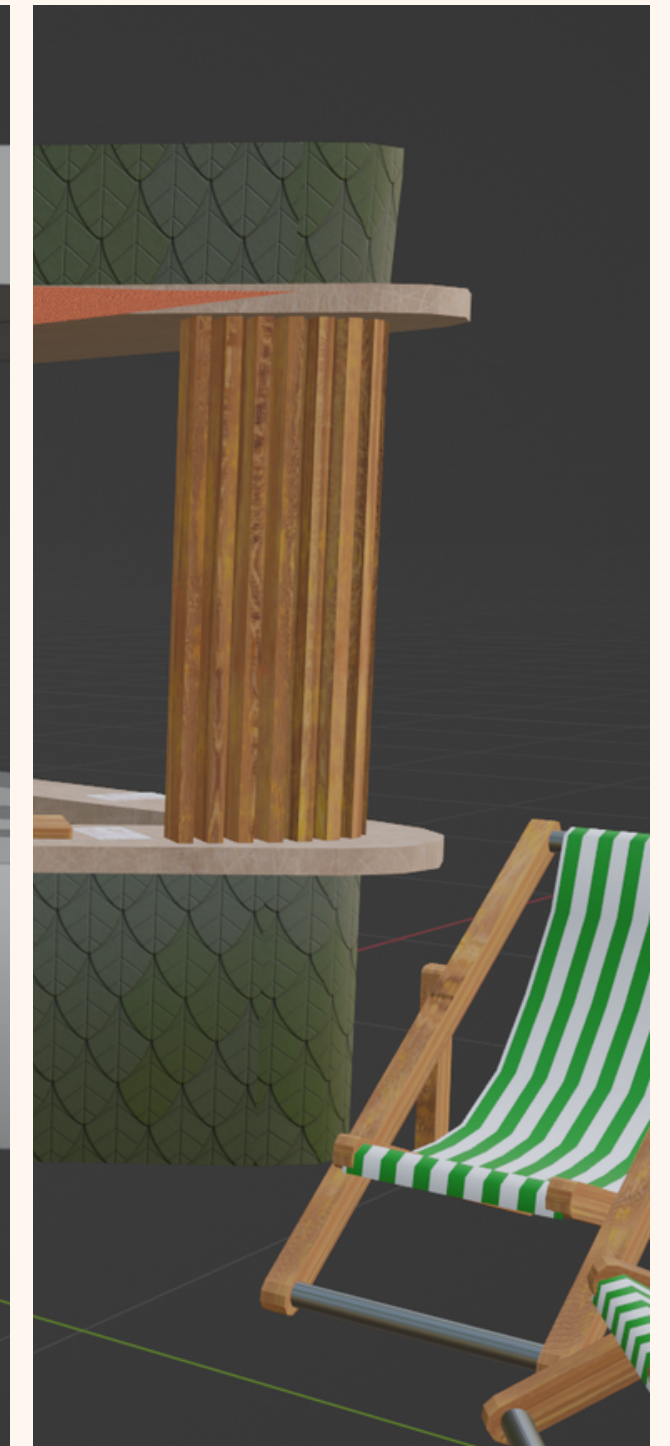
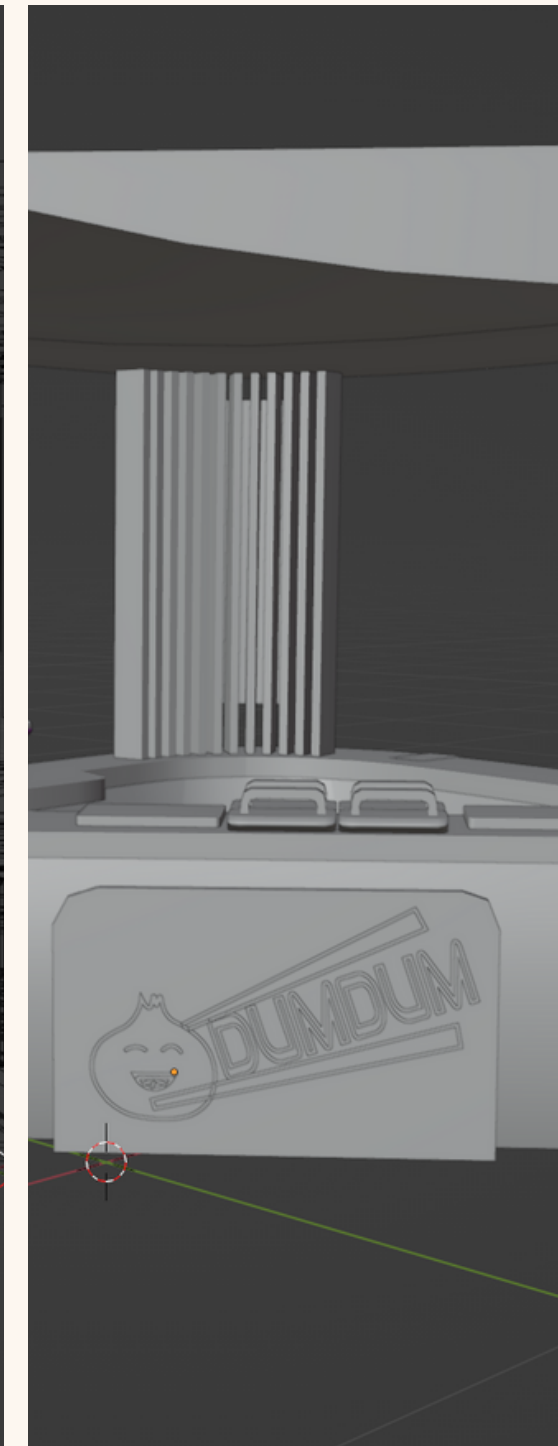
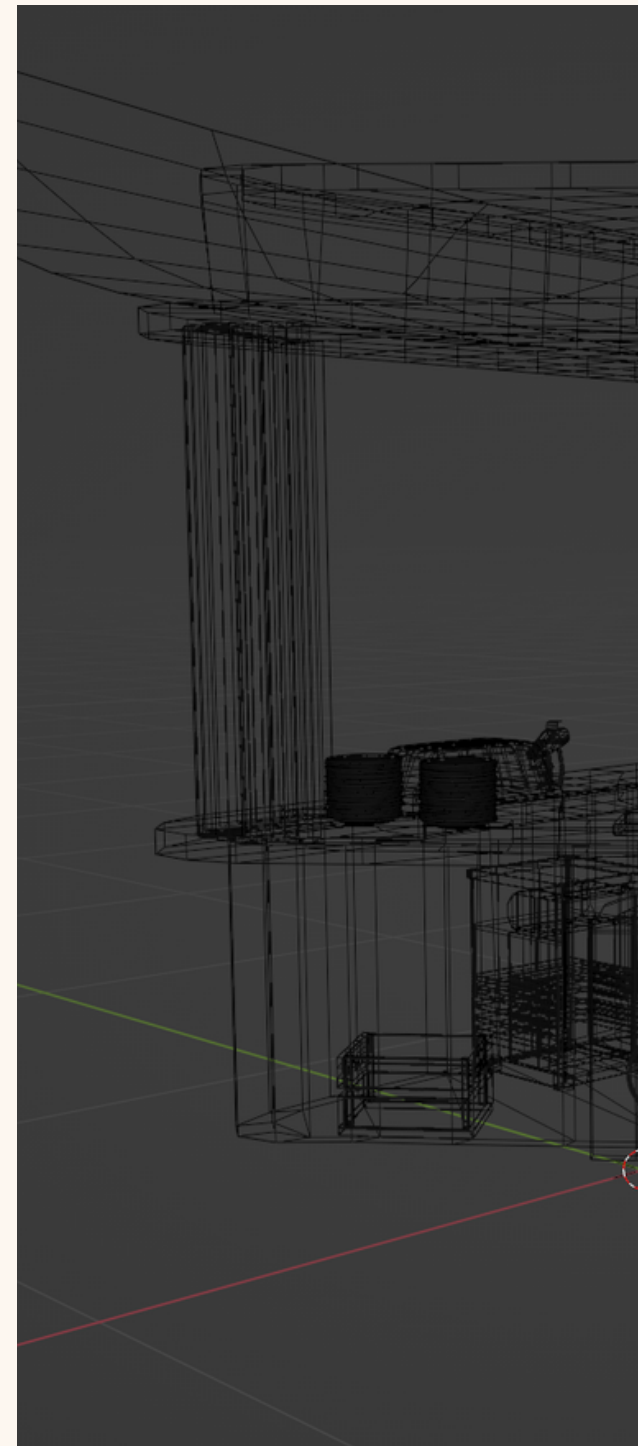
- Over time, what do blue-green roofs accomplish?
- How can we visualize the effects of the drainage systems in actual conditions



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# PROCESS

- **Model**
- **Augment**
- Inform
- Interact
- Deploy



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# FUTURE PLANS

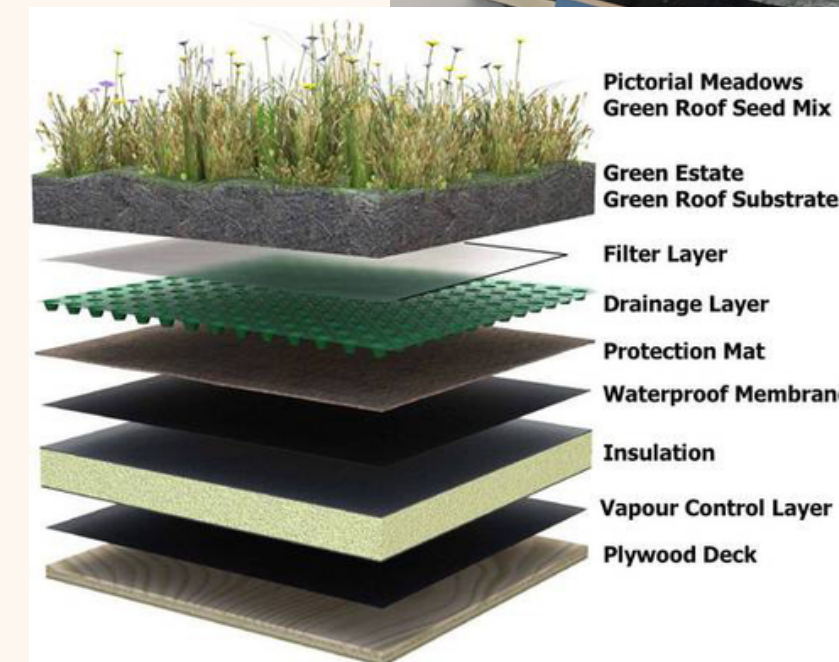


What we will further research:

- How much human interaction will we incorporate?
- Explore possible negative impacts on environment
- How can we make it self-sustainable?
- Can these be connected to the bigger infrastructure of the city? (sewage etc.)

Optional:

- Make a physical cross section of the layers of a green roof





**THANK YOU**

