

HOME TO FORK¹

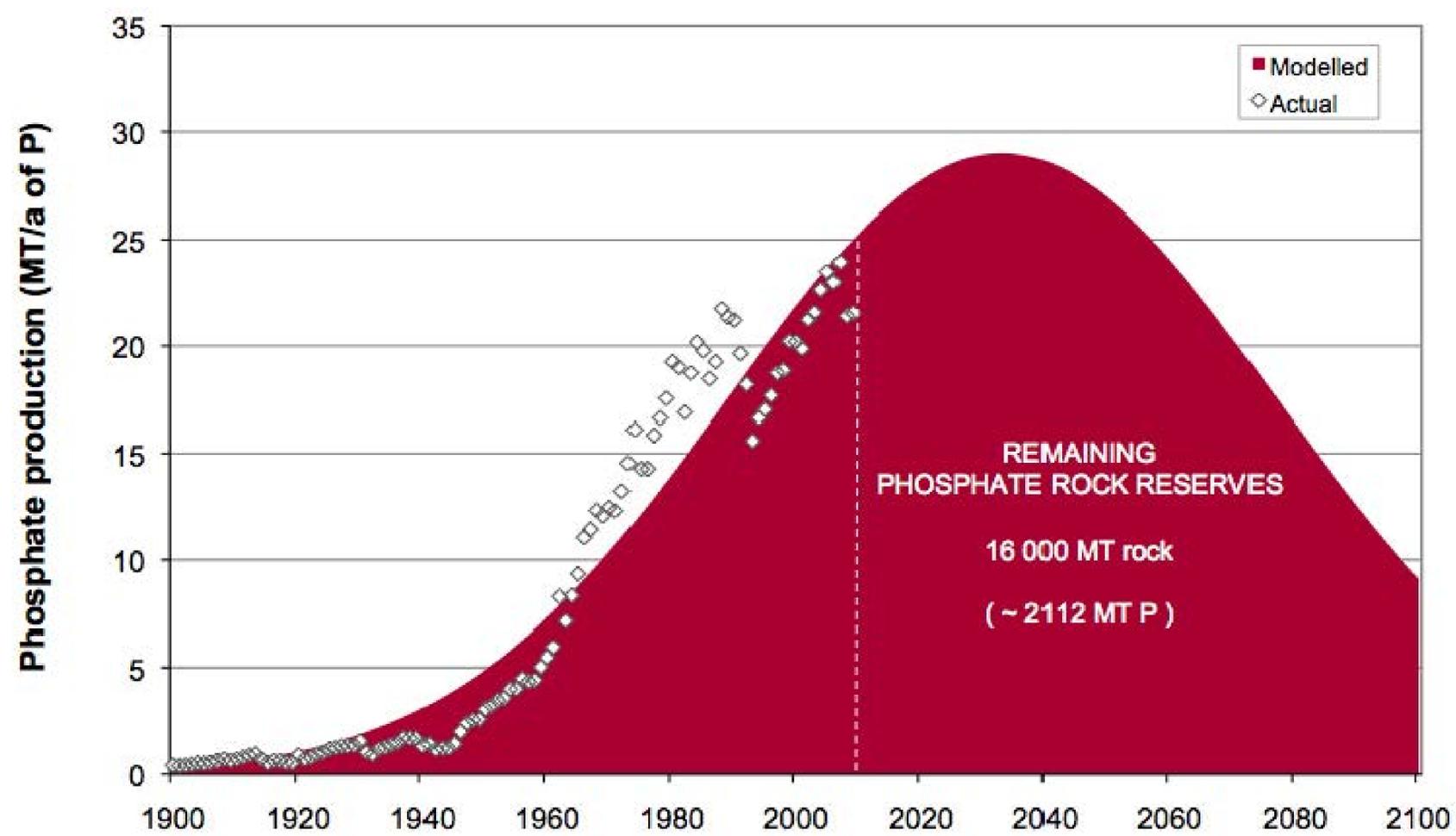
*facing the²
false sense of
food security*

***“Life can multiply until all the phosphorus
has gone and then there is an inexorable halt
which nothing can prevent...”***

—Isaac Asimov, “Life’s Bottleneck”

C, H, N, O, P, S





1

US Geological Survey data, data from the European Fertilizer Manufacturers Association (2000), International Fertilizer Industry Association (2006).

2033

80% Agricultural Land¹ for Feed & Grazing





What strategies can effectively integrate
food production and preparation¹
within residential communities²
to develop a sustainable food system?³

A Dutch landscape featuring several windmills in the background, a church spire, and a row of houses. In the foreground, two brown and white cows are lying in a lush green field under a blue sky with scattered clouds. The text 'FALSE SENSE of FOOD SECURITY' is overlaid in large white letters.

FALSE SENSE of FOOD SECURITY



3.6 BILLION kg of meat exported (2020)¹

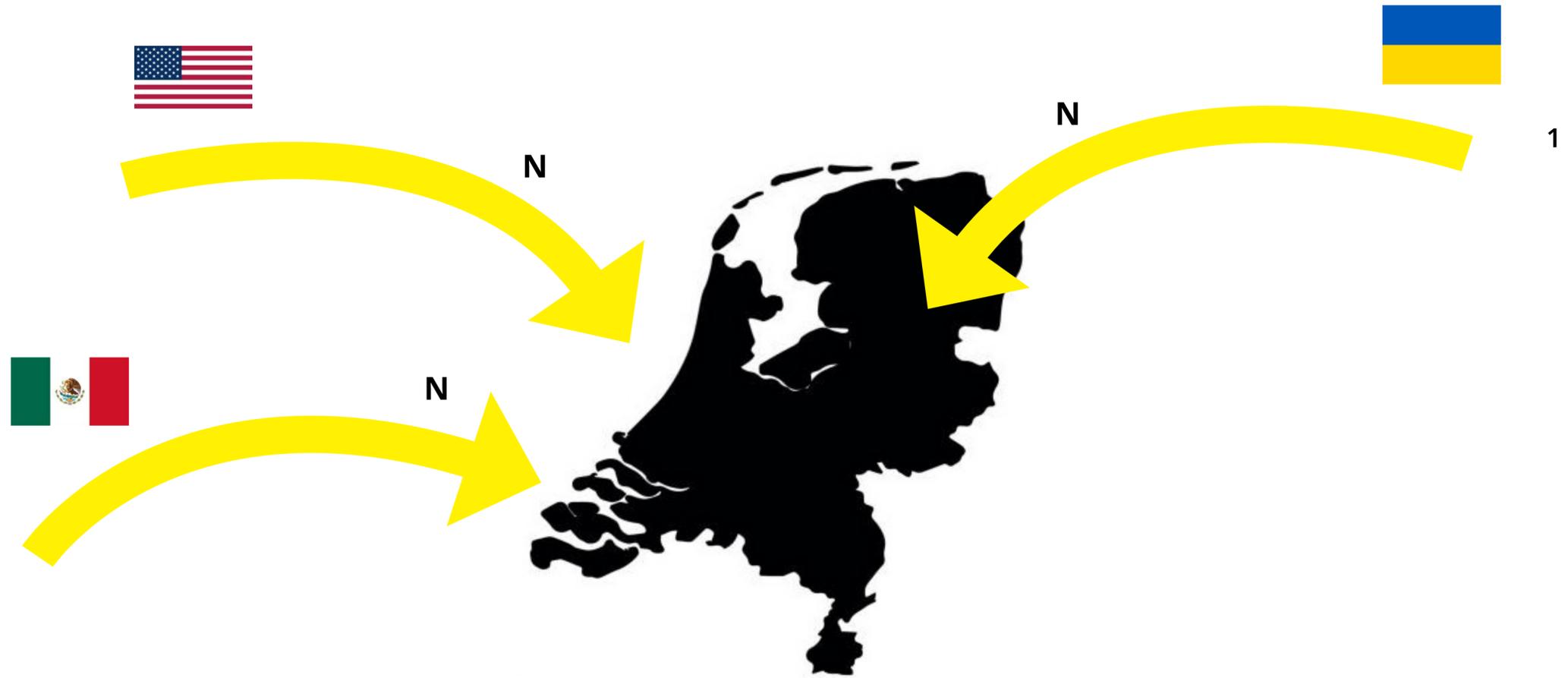
Largest exporter of meat in EU by both value and weight (2020)²
(85% produced or processed domestically)

Highest livestock density in Europe (2020)³

1 (Centraal Bureau voor de Statistiek, 2021)

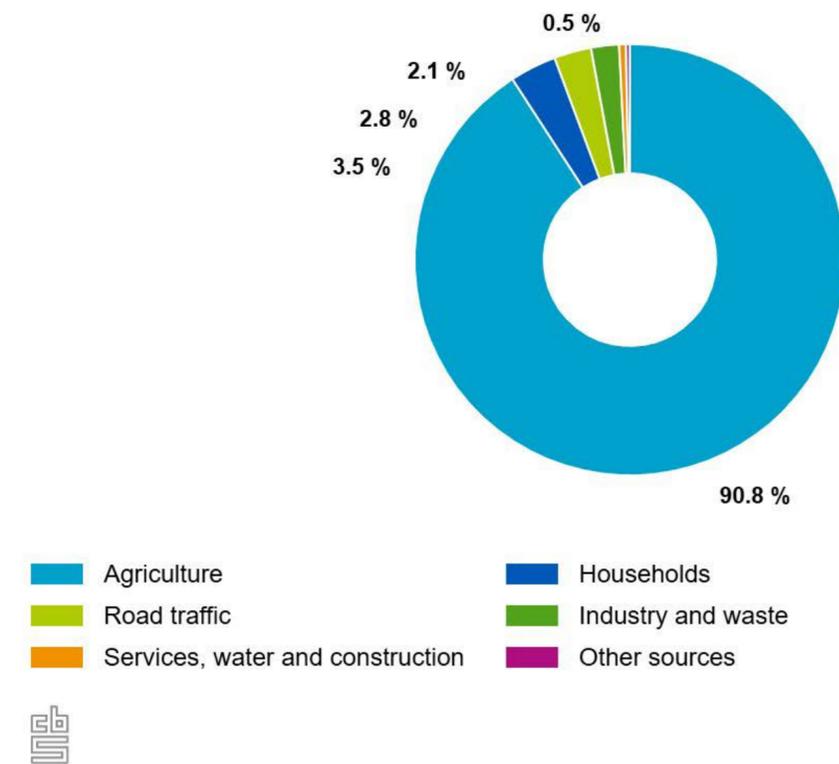
2 (Centraal Bureau voor de Statistiek, 2021)

3 (European Union, 2023)



Highest Nitrogen emissions¹ per hectare in Europe (2019)

Emissions of ammonia (NH₃) by source, 2022²



Loss of **approximately 80%**¹ of the Netherlands' original biodiversity

Nitrogen pollution can cause acid rain, soil deterioration,²
groundwater pollution and biodiversity loss



1



1



1

**Insects pollinate 90% of
wild plants & 75% of crops
in the Netherlands**

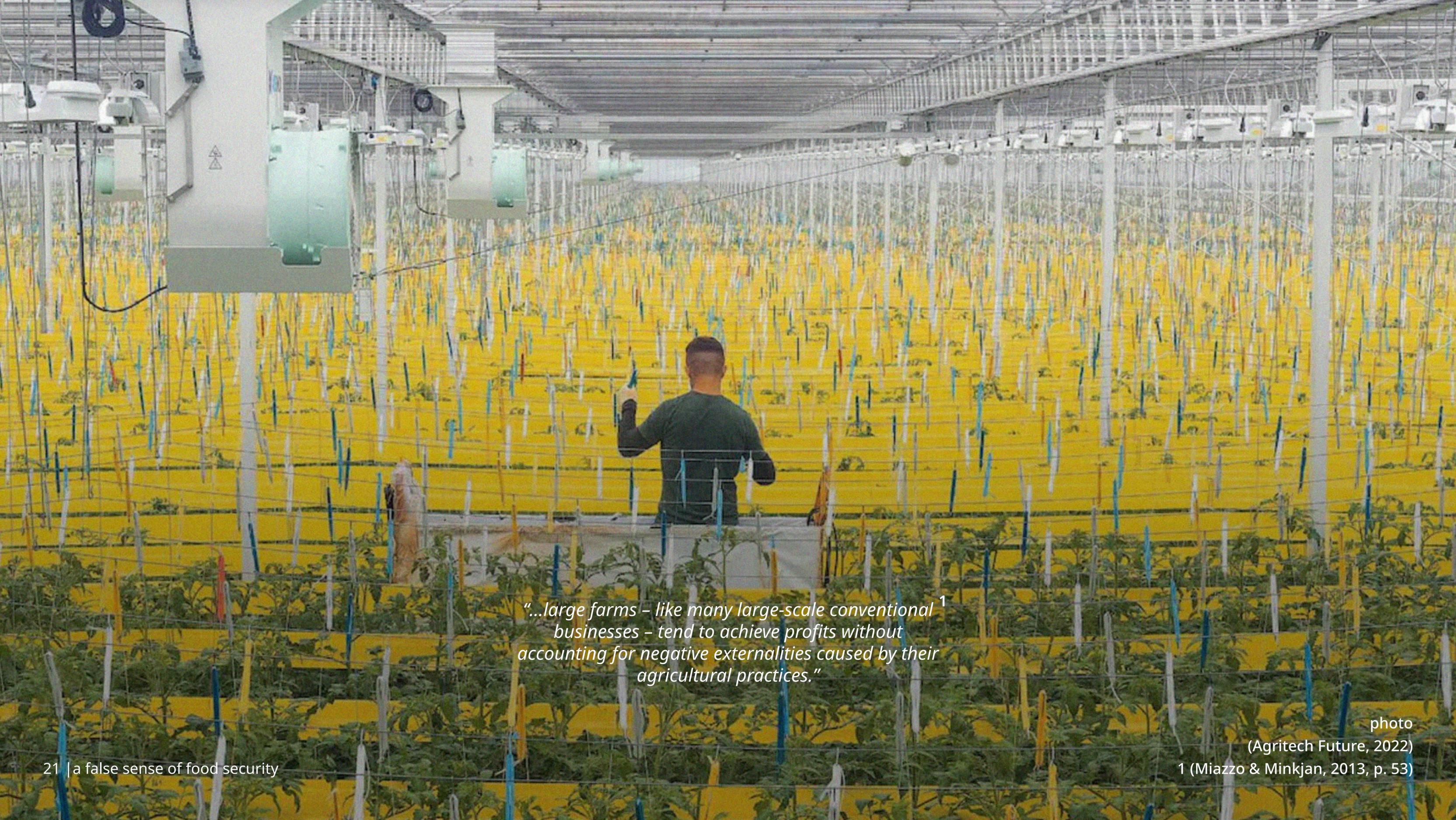
1

Future of Food Security?

Rank (113 countries)	Overall score	Affordability	Availability	Quality and Safety	Sustainability and Adaptation
	⬇	⬆	⬆	⬆	⬆
1 st Finland	83.7	91.9	70.5	88.4	82.6
2 nd Ireland	81.7	92.6	70.5	86.1	75.1
3 rd Norway	80.5	87.2	60.4	86.8	87.4
4 th France	80.2	91.3	69.0	87.7	70.3
5th Netherlands	80.1	92.7	70.7	84.7	69.2
6 th Japan	79.5	89.8	81.2	77.4	66.1
=7 th Sweden	79.1	91.9	68.3	85.0	68.3
=7 th Canada	79.1	88.3	75.7	89.5	60.1
9 th United Kingdom	78.8	91.5	71.6	77.6	71.1
10 th Portugal	78.7	90.0	77.0	79.8	64.5



THE GREAT DISCONNECT



"...large farms – like many large-scale conventional¹ businesses – tend to achieve profits without accounting for negative externalities caused by their agricultural practices."



"Netherlands Exports of meat and edible meat offal to China¹ was US\$482.47 Million during 2023, according to the United Nations COMTRADE database on international trade."



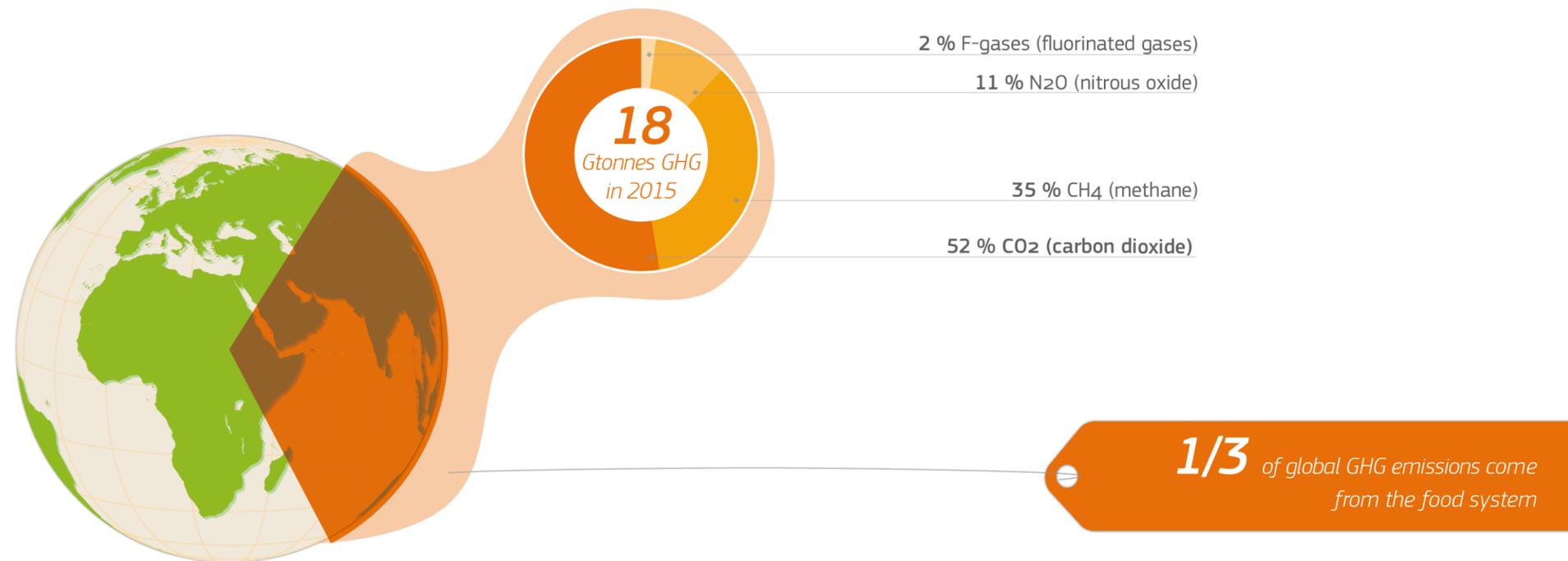
"Of the assortment in the supermarket, more than 70¹ percent consists of highly processed foods such as soft drinks, snacks and fast food. Only 16 percent of the products are fresh, unprocessed or lightly processed."



"In industrialized economies food losses primarily occur in the latter stages of the food chain: in supermarkets and restaurants, and at home."

Food System is responsible for **34%** of Global GHGs

1

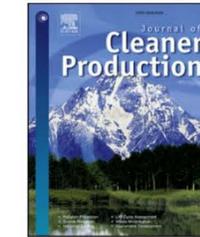




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Consumers' perceptions on food-related sustainability: A systematic review

L.M. van Bussel^{*}, A. Kuijsten, M. Mars, P. van 't Veer

Division of Human Nutrition and Health, Wageningen University and Research, Stippeneng 4, 6708, WE, Wageningen, the Netherlands

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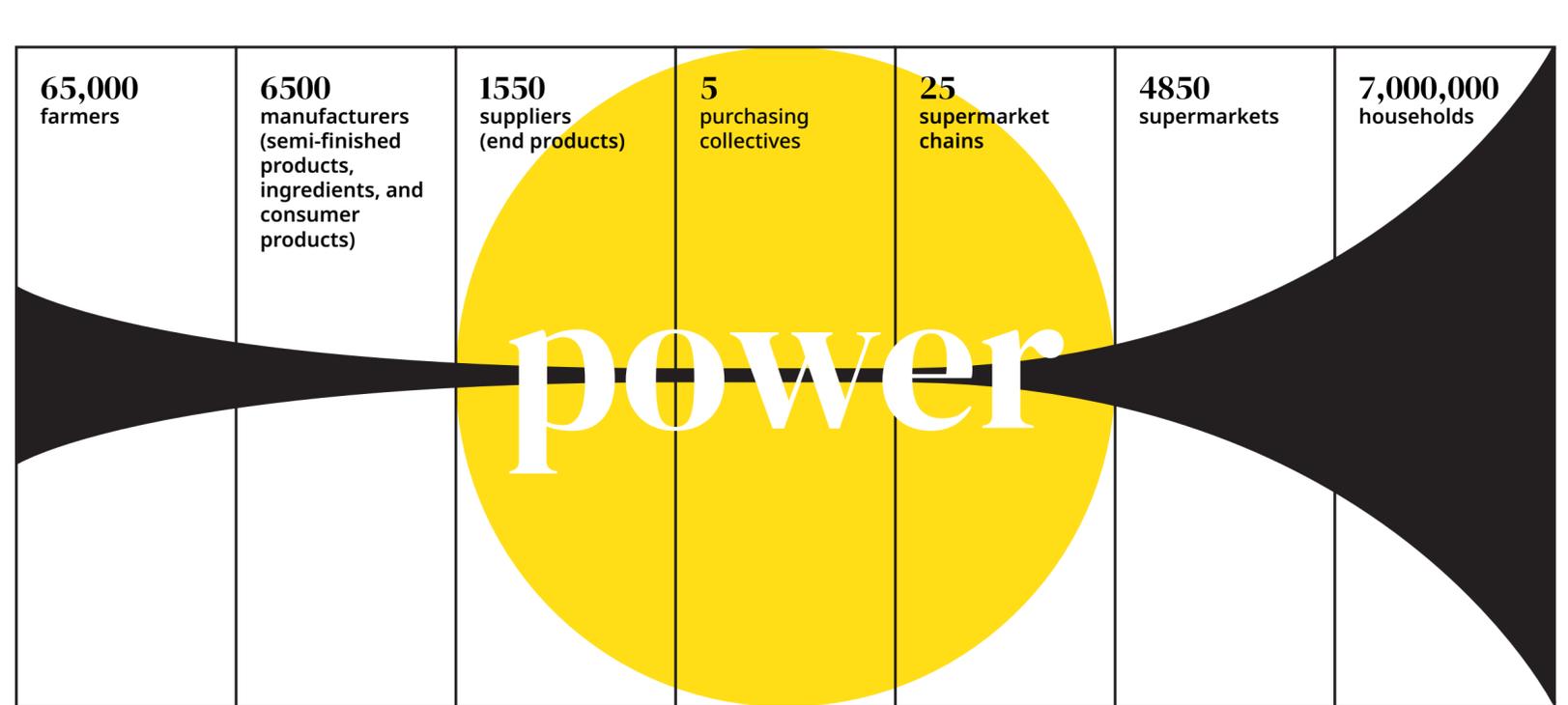
ABSTRACT

Consumers play a crucial role in reducing the burden on the environment through their food choices. Currently, food choices are mainly determined by price, convenience, taste and health. To change eating patterns to more sustainable eating patterns, it is essential to understand how consumers interpret "sustainability" in relation to the food supply chain. The aim of this systematic review is to categorize and to describe consumer perceptions of food-related environmental sustainability in general. We conducted a systematic literature review of quantitative and qualitative studies published between January 2010 and June 2020. This resulted in 76 articles; 49 quan-

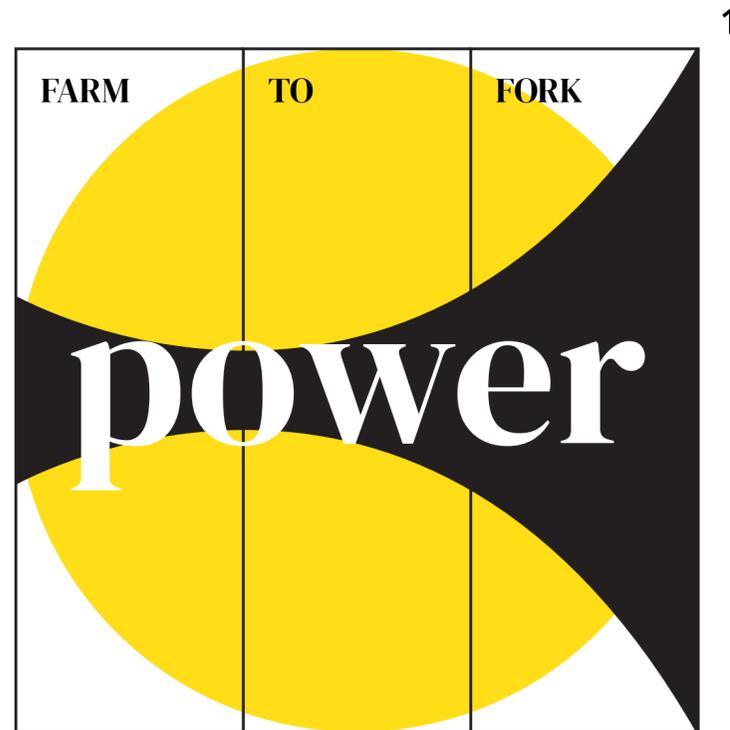
"...we can conclude that consumers are not aware of the actual impact of food production, and in particular livestock production. Some consumers recognize that there is some impact involved in food production, while others believe there is no connection between food production and the environment at all."

2

Food Supply Chain



Shortening the supply chain



Addressing the issues of waste, environmental impact, nutrition, and resource depletion by shortening the supply chain.

Home to Fork



Sitopia (Greek sitos, food + topos, place).
Term coined by Carolyn Steel—architect, lecturer, author.
Providing consumers with the power of food autonomy.

1



RISE AND RUIN OF INTENTIONAL COMMUNITIES

intentional communities

monasteries

communes

ecovillages

sitopic communities

*90% of intentional communities fail*¹

—Diana Leafe Christian, “Creating a Life Together”



**Bonton Farms
(Dallas, Texas, USA)**

**link food production
to local economies.**



Occidental Arts & Ecology Center
(Sonoma County, California, USA)

**offer educational
opportunities.**



Earthaven Ecovillage
(Western North Carolina, USA)

**communal areas
allow for varying
affordability. isolation
may result in
disjointed community.**



Windsong Cohousing
(Langley, British Columbia, Canada)

**inner community
space encourages
social interaction.
rigid ownership model
results in declining
population.**



Kailash Ecovillage
(Portland, Oregon, USA)

**implement circular
systems. affordable
rental model in
exchange for
participation.**



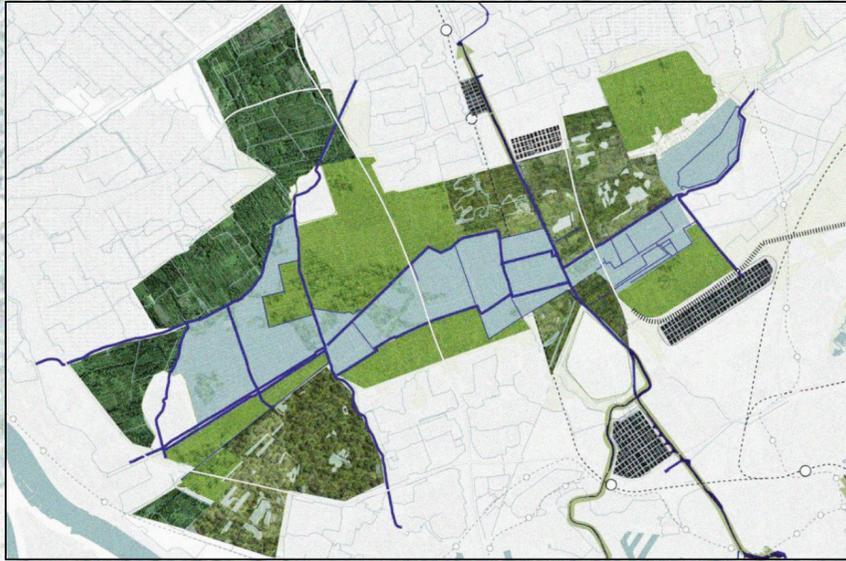
food as a social glue



food as a social glue



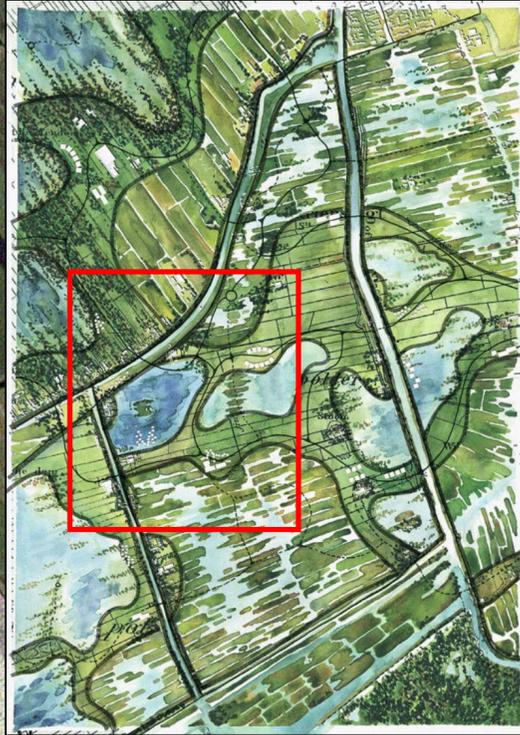
WHY MIDDEN Delfland?



1



2

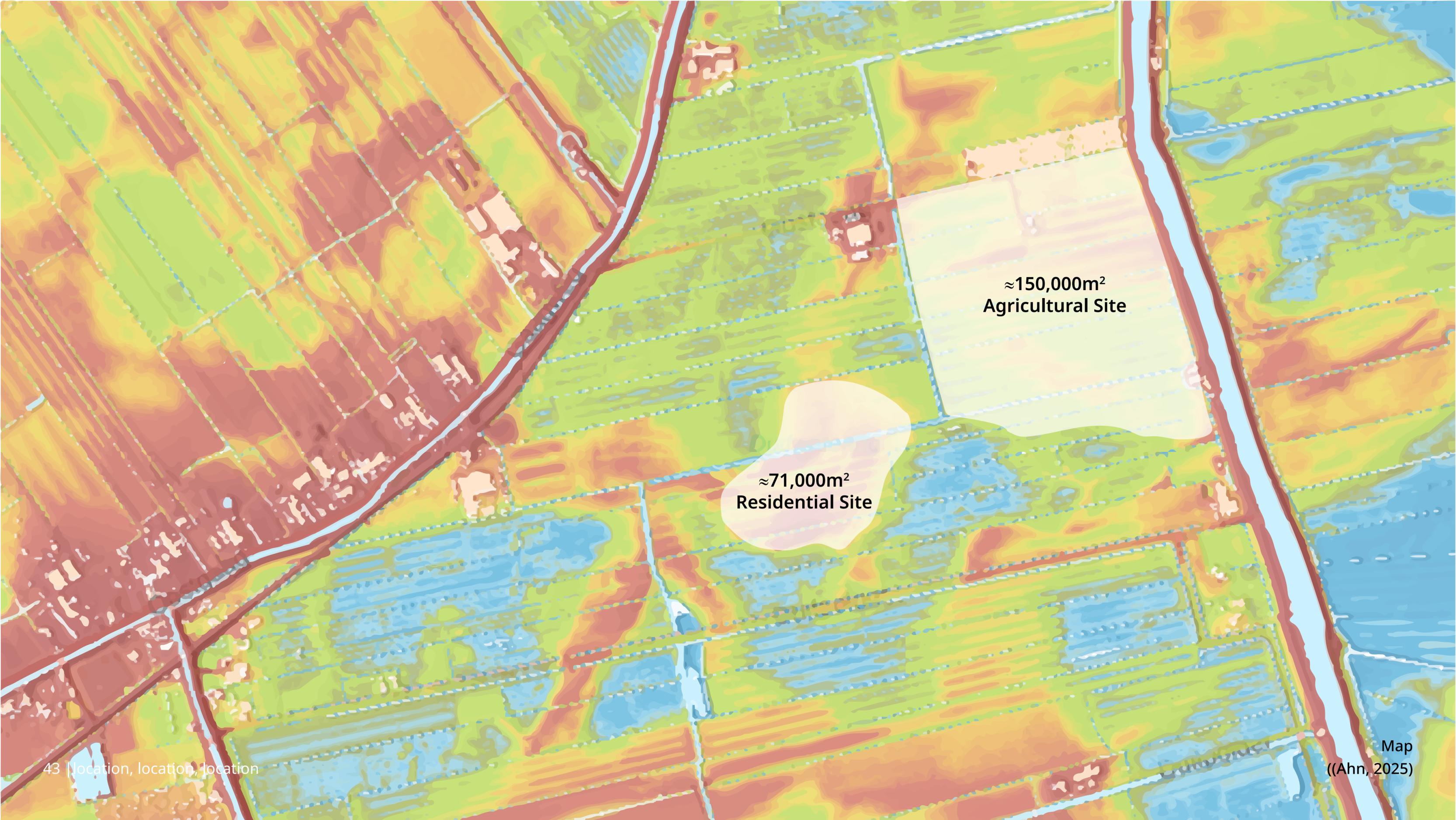


Reasons for Site Selection

1. Designated as "high value" area
2. Core location of Midden-Delfland
3. Major bird habitat
4. Rural setting
5. Intersection of community

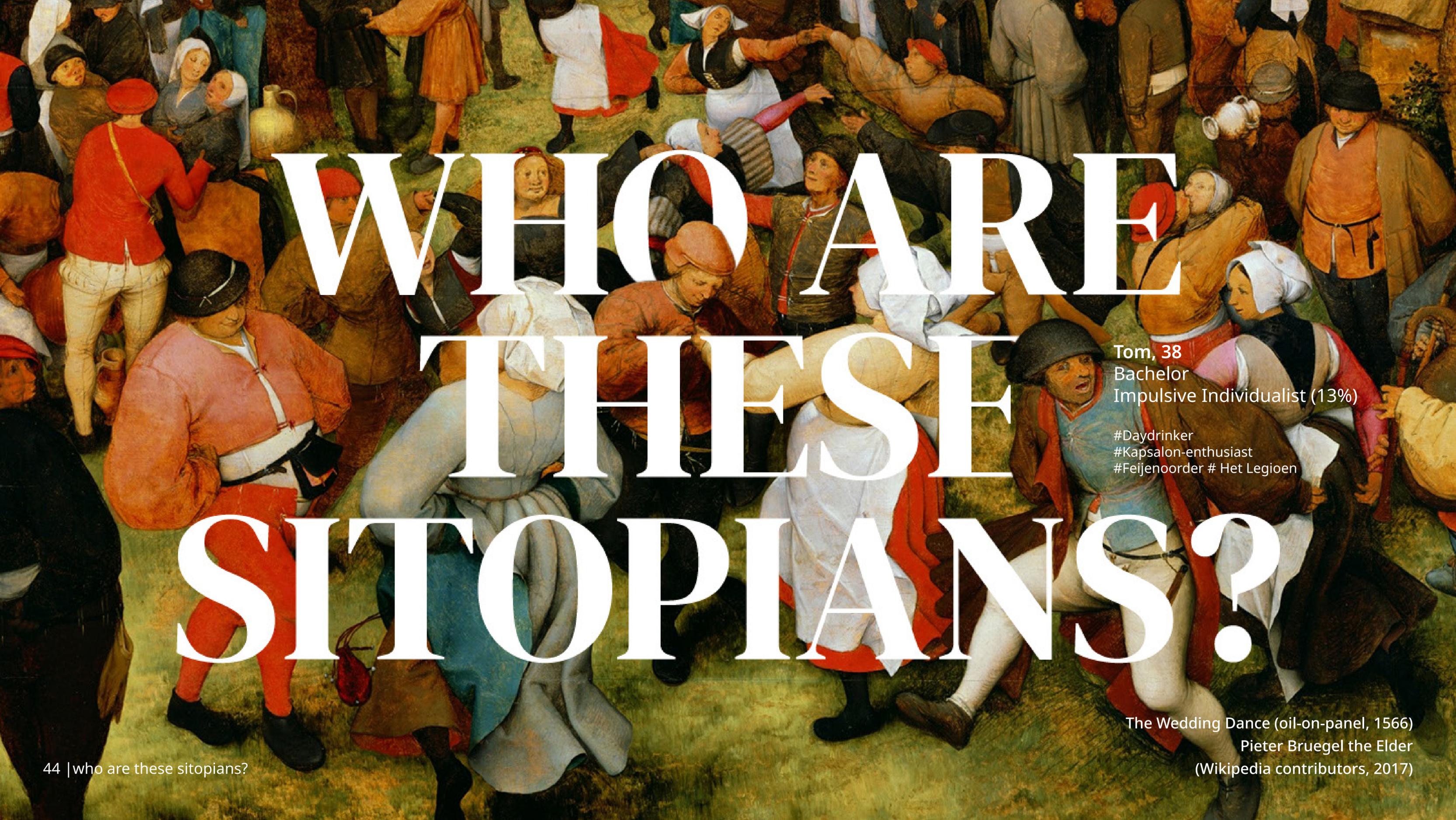
Masterplan Design Decisions

1. Design around existing residents
2. Nuanced borders based on natural markers
3. Flooding based on soil depression
4. Wildlife habitat protection
5. Contributes to social cohesion of region
6. Addresses economic activity to replace livestock



≈150,000m²
Agricultural Site

≈71,000m²
Residential Site

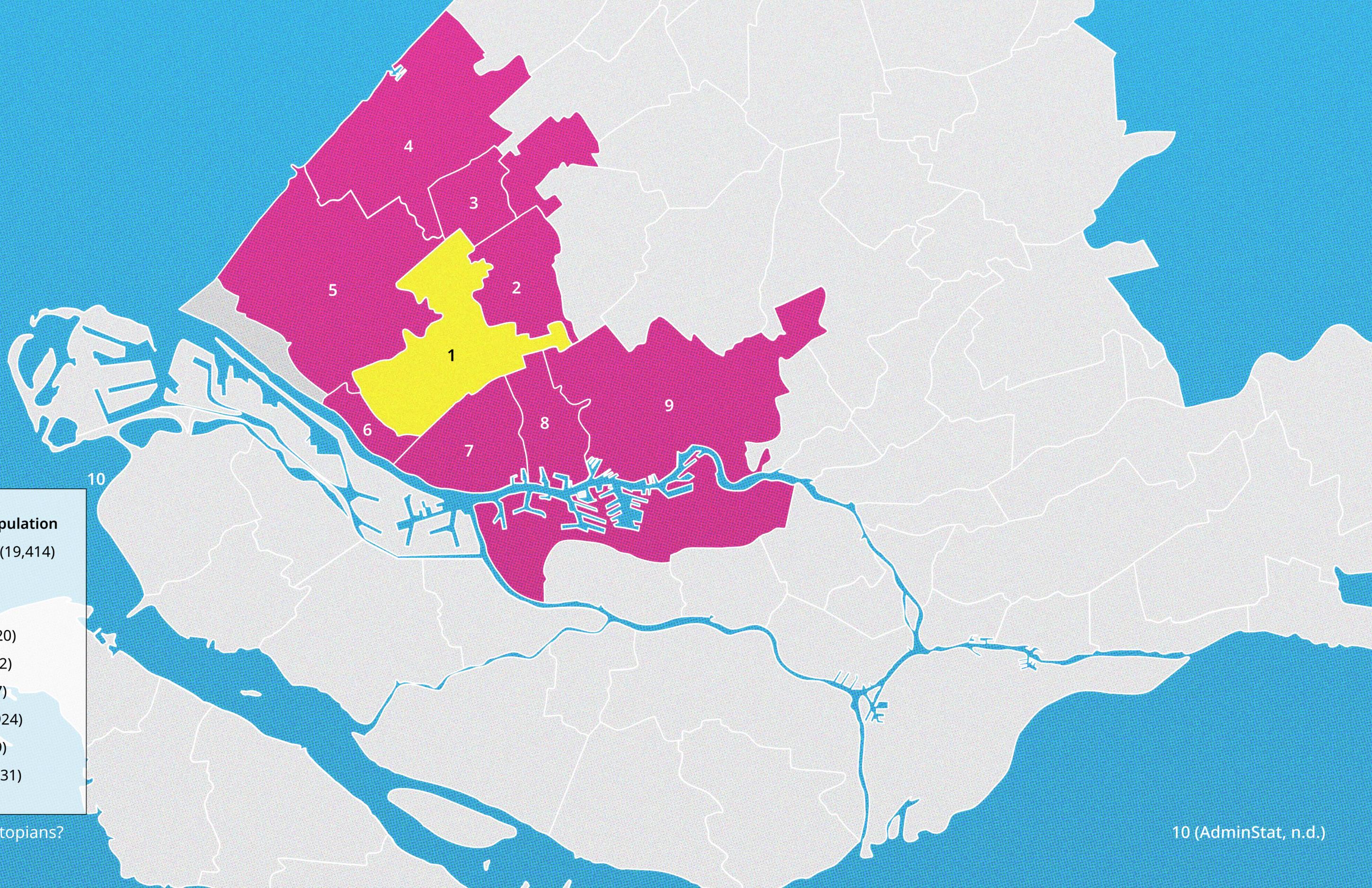
The background of the entire page is a detailed reproduction of Pieter Bruegel the Elder's painting 'The Wedding Dance' (1566). The scene is a bustling outdoor wedding celebration. In the center, a bride in a white gown and a groom in a dark suit are dancing. They are surrounded by a large crowd of guests in 16th-century attire, including men in tunics and hats, and women in long dresses and headscarves. Some guests are dancing, some are talking, and others are holding drinks. The overall atmosphere is one of a lively, communal event. The text 'WHO ARE THESE SITOPPIANS?' is overlaid in large white letters across the center of the image.

WHO ARE THESE SITOPPIANS?

Tom, 38
Bachelor
Impulsive Individualist (13%)

#Daydrinker
#Kapsalon-entusiast
#Feijenoorder # Het Legioen

The Wedding Dance (oil-on-panel, 1566)
Pieter Bruegel the Elder
(Wikipedia contributors, 2017)

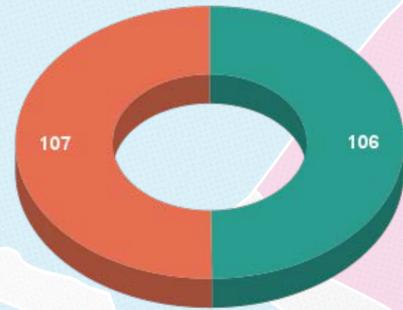


Municipalities & Population

- 1. Midden-Delfland (19,414)
- 2. Delft (103,581)
- 3. Rijswijk (55,220)
- 4. Den Haag (548,320)
- 5. Westland (111,382)
- 6. Maassluis (33,567)
- 7. Vlaardingen (73,924)
- 8. Schiedam (79,279)
- 9. Rotterdam (651,631)

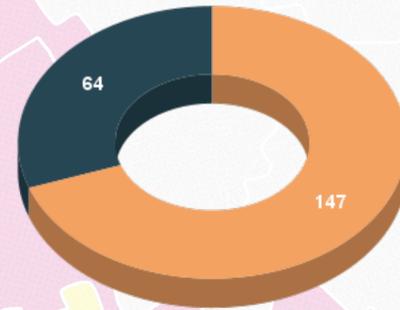
SEX ¹

- MALES
- FEMALES



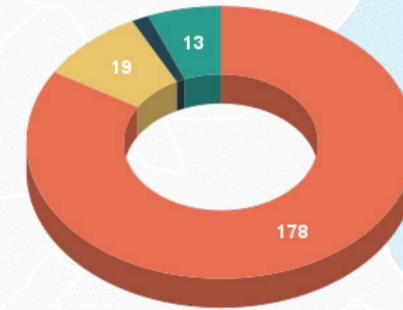
BIRTH COUNTRY ¹

- NETHERLANDS
- OTHER COUNTRY



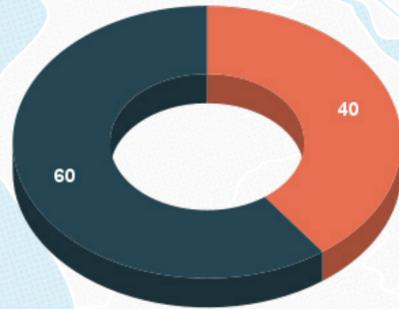
CITIZENSHIP ¹

- NETHERLANDS
- EUROPEAN UNION
- EUROPE (REST)
- OTHER COUNTRY



HOUSEHOLD TYPE ¹

- ONE-PERSON
- MULTI-PERSON



AGE DISTRIBUTION ¹



CIVIL STATUS ²

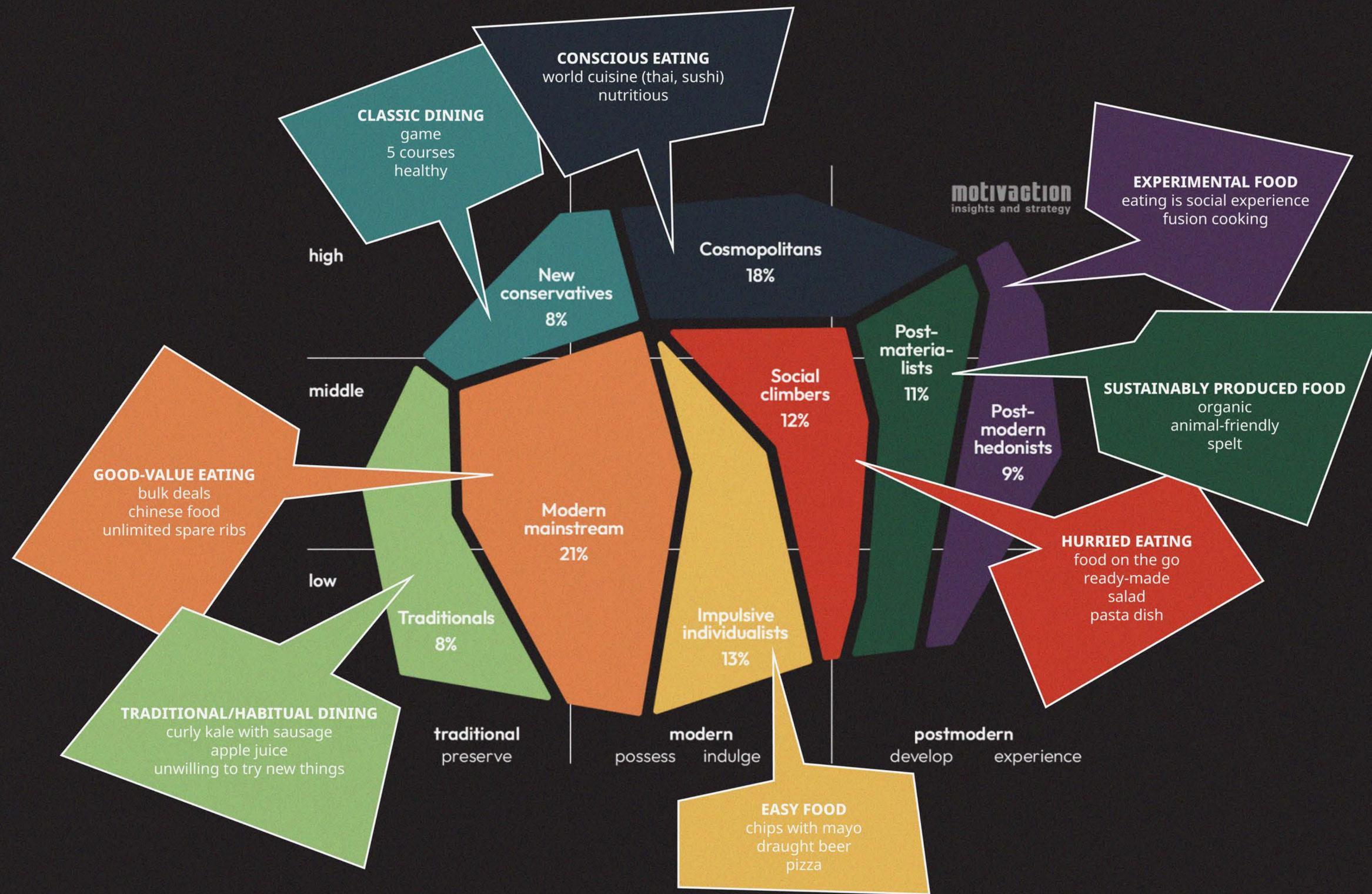


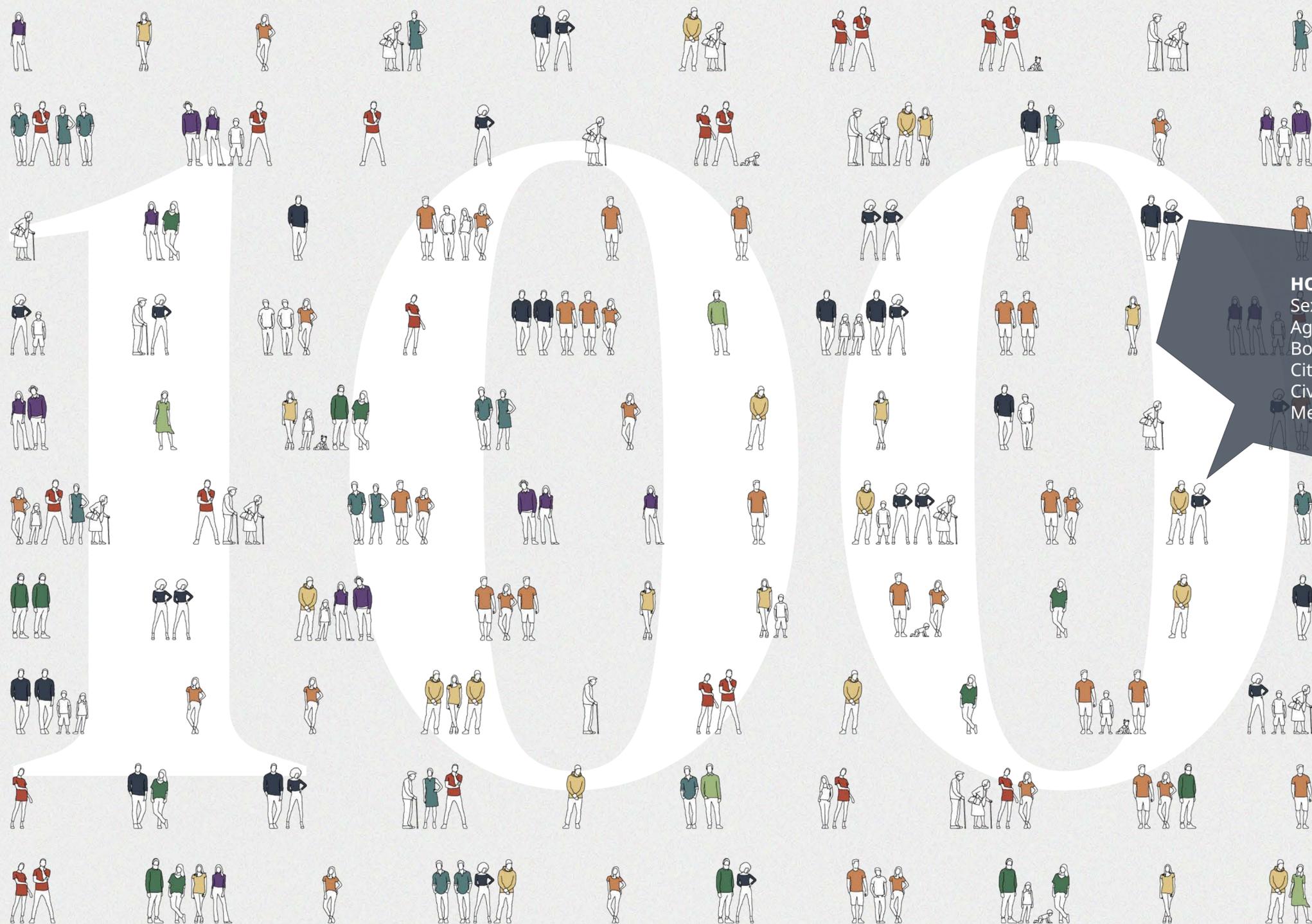
"Relocations are often related to events in a person's life that cause a change in their housing needs... Because many of these life events occur between the ages of 18 and 35, people in this age group move more often than average."

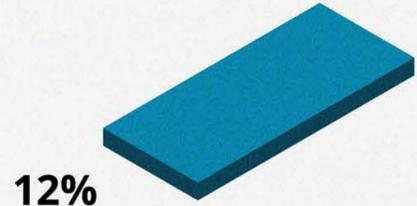
¹ (AdminStat, n.d.)

² (City Population, 2025)

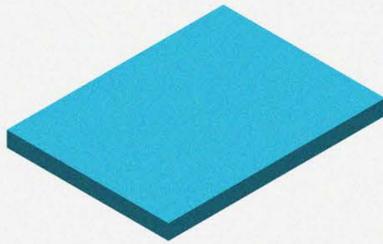
³ (Centraal Bureau voor de Statistiek, 2024b)



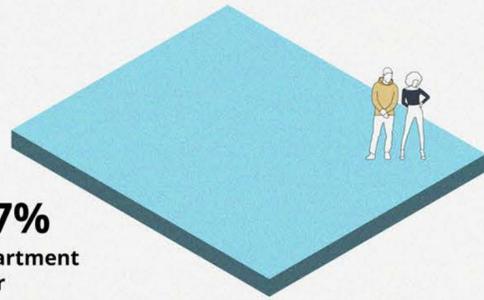




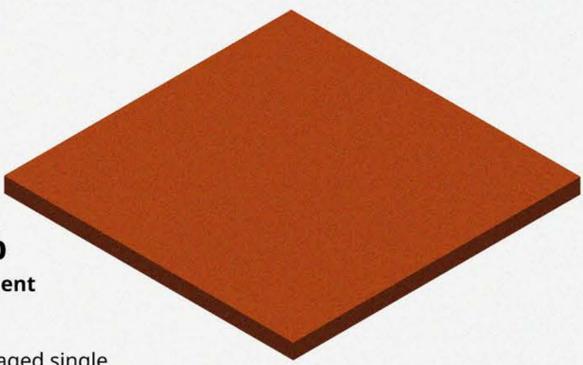
12%
**Student housing
 w/ shared facilities**
 Students
 Young professionals
 18~mid 20s
 Bachelors/ Bachelorette
 Single-households



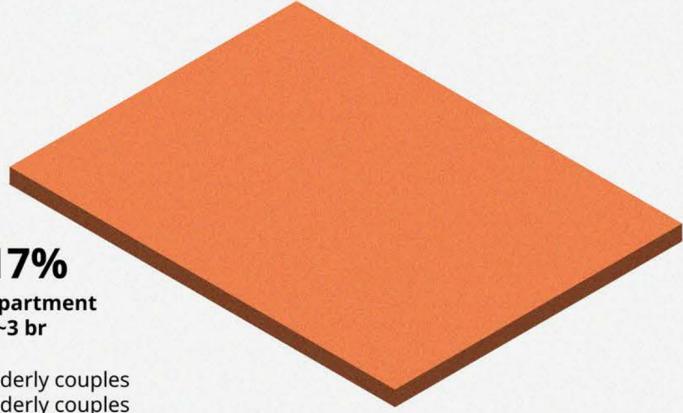
6%
**Studio
 w/ mezzanine**
 Students
 Young professionals
 20s~early 30s
 Bachelors/ Bachelorette
 Single-households



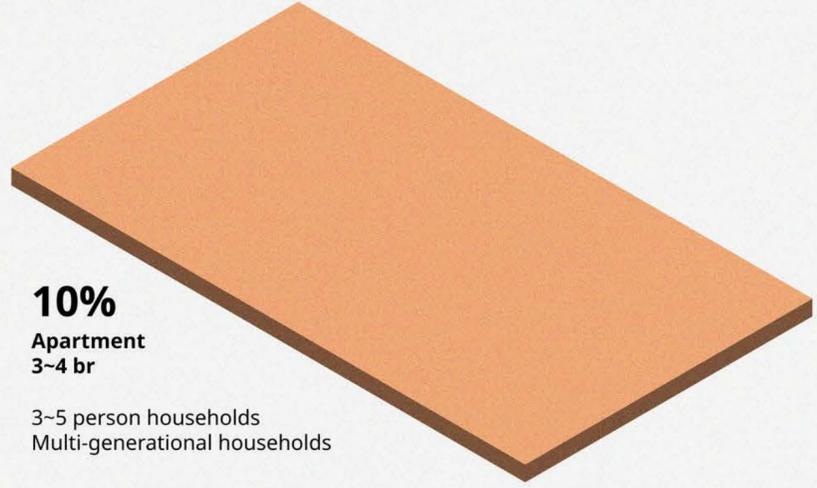
27%
**Apartment
 1 br**
 Elderly
 Young professionals
 Single parents w/ 1 child
 Widows/Widowers
 Divorced
 Young couples
 Nomadic couples
 Single-households



28%
**Apartment
 1~2 br**
 Middle-aged single
 30s to elderly couples
 Single parent w/ 1 teen child
 Young couple w/ 1 child
 Non-conventional households
 Multi-households

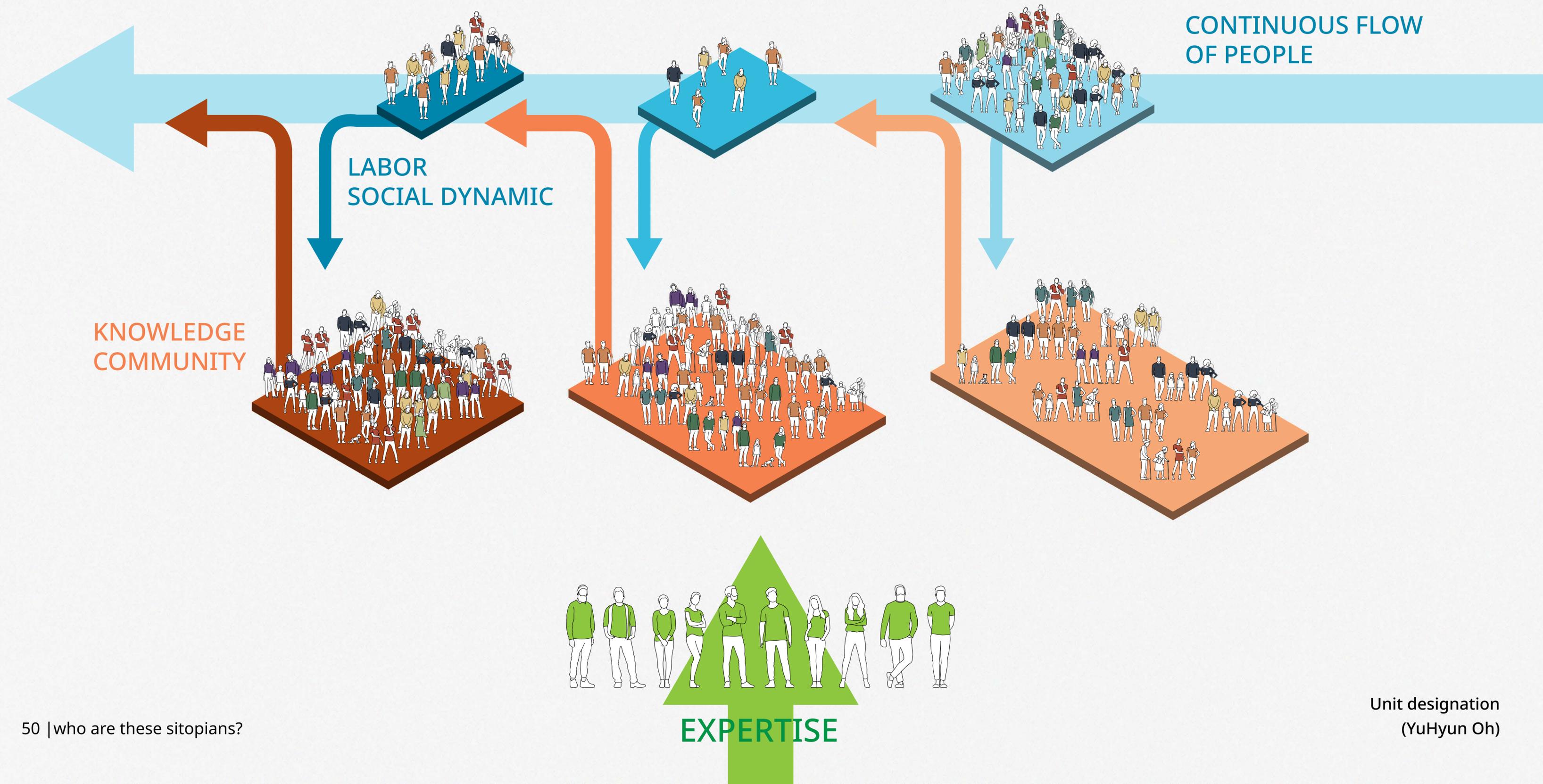


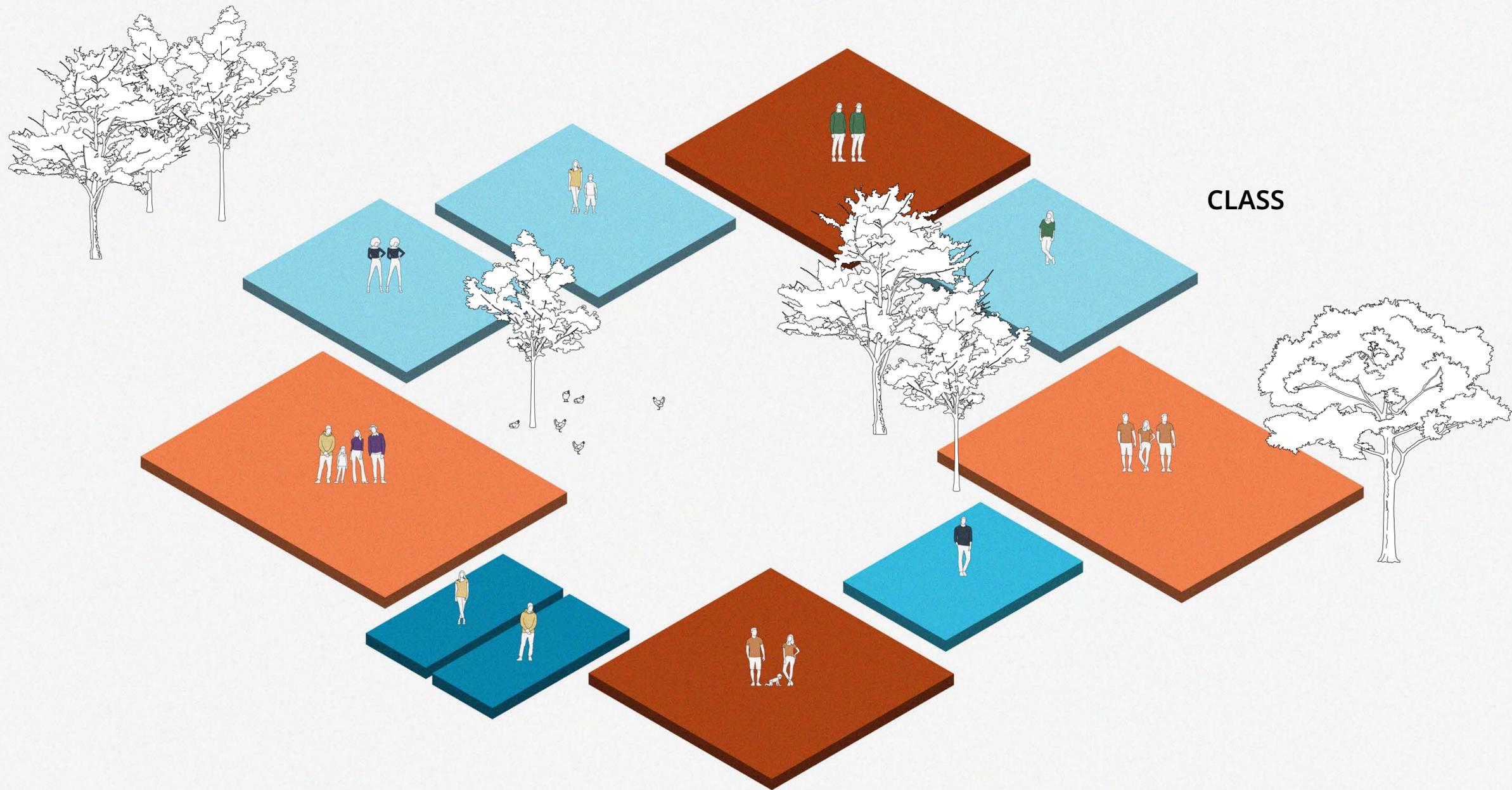
17%
**Apartment
 2~3 br**
 Elderly couples
 Elderly couples
 Middle-aged couples w/ 1 parent
 3~4 person conventional households
 Non-conventional households
 Multi-households



10%
**Apartment
 3~4 br**
 3~5 person households
 Multi-generational households

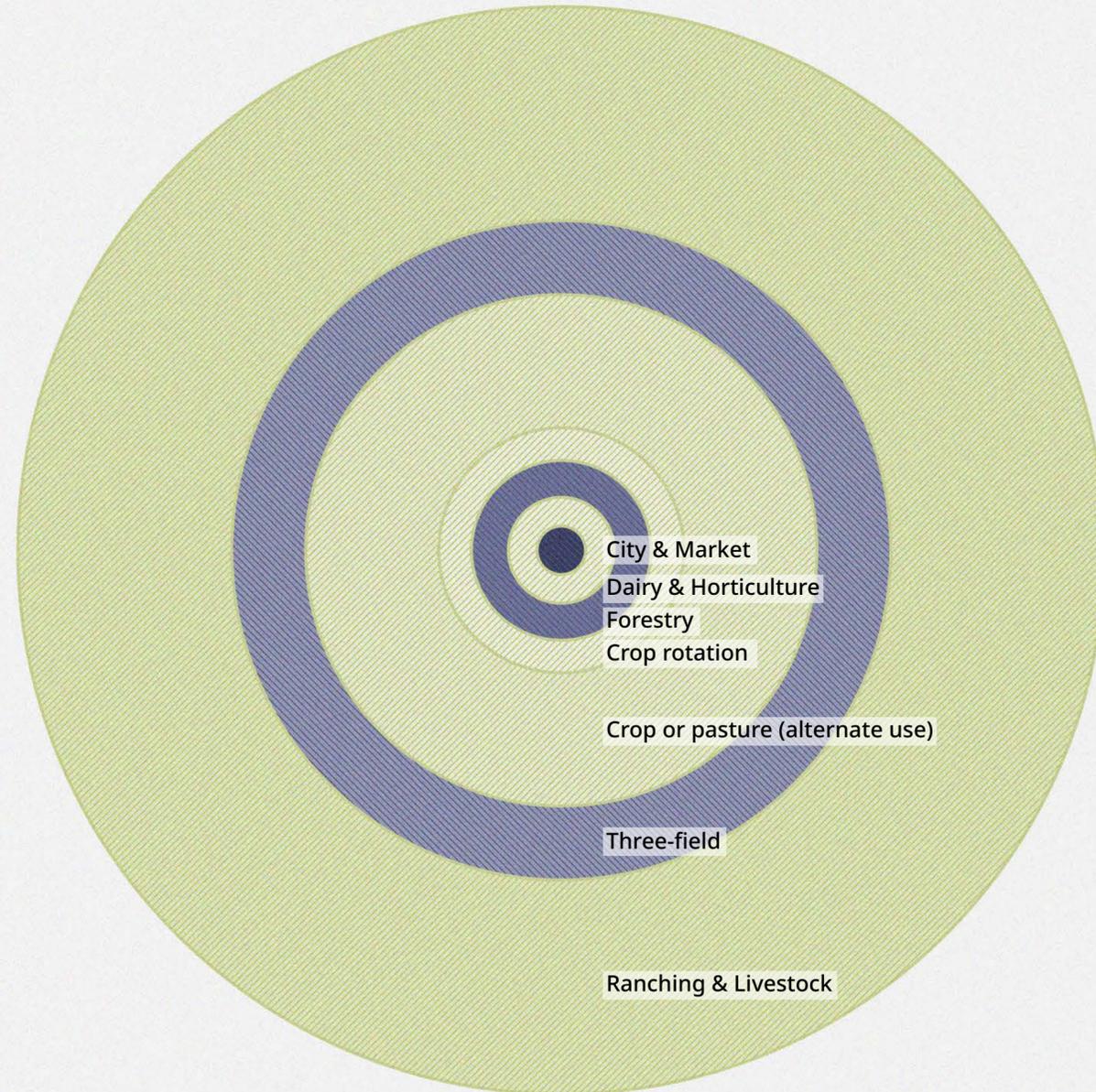
■ RENT
 ■ COLLECTIVE OWNERSHIP



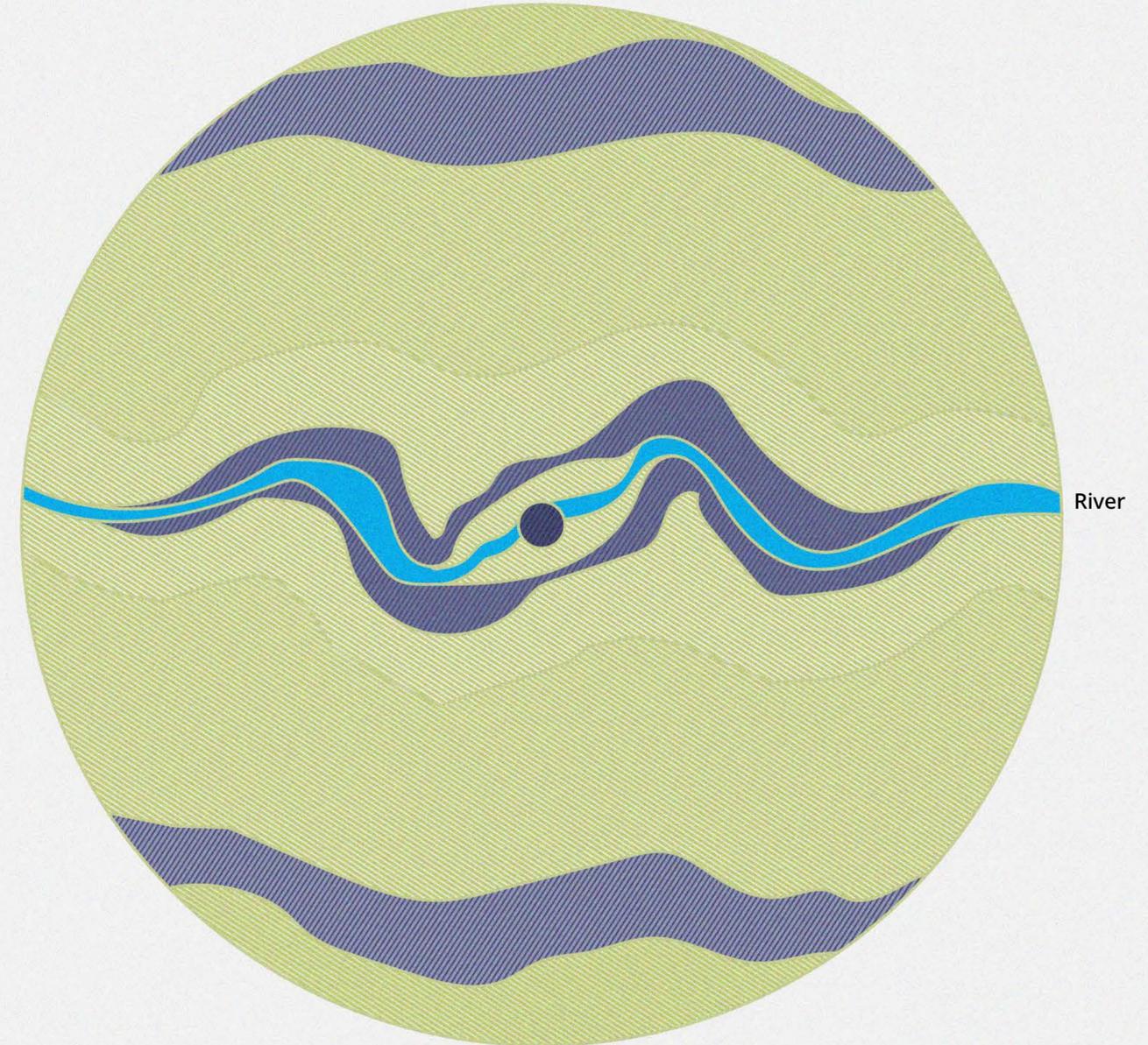


SITOPIC MAPS PLAN

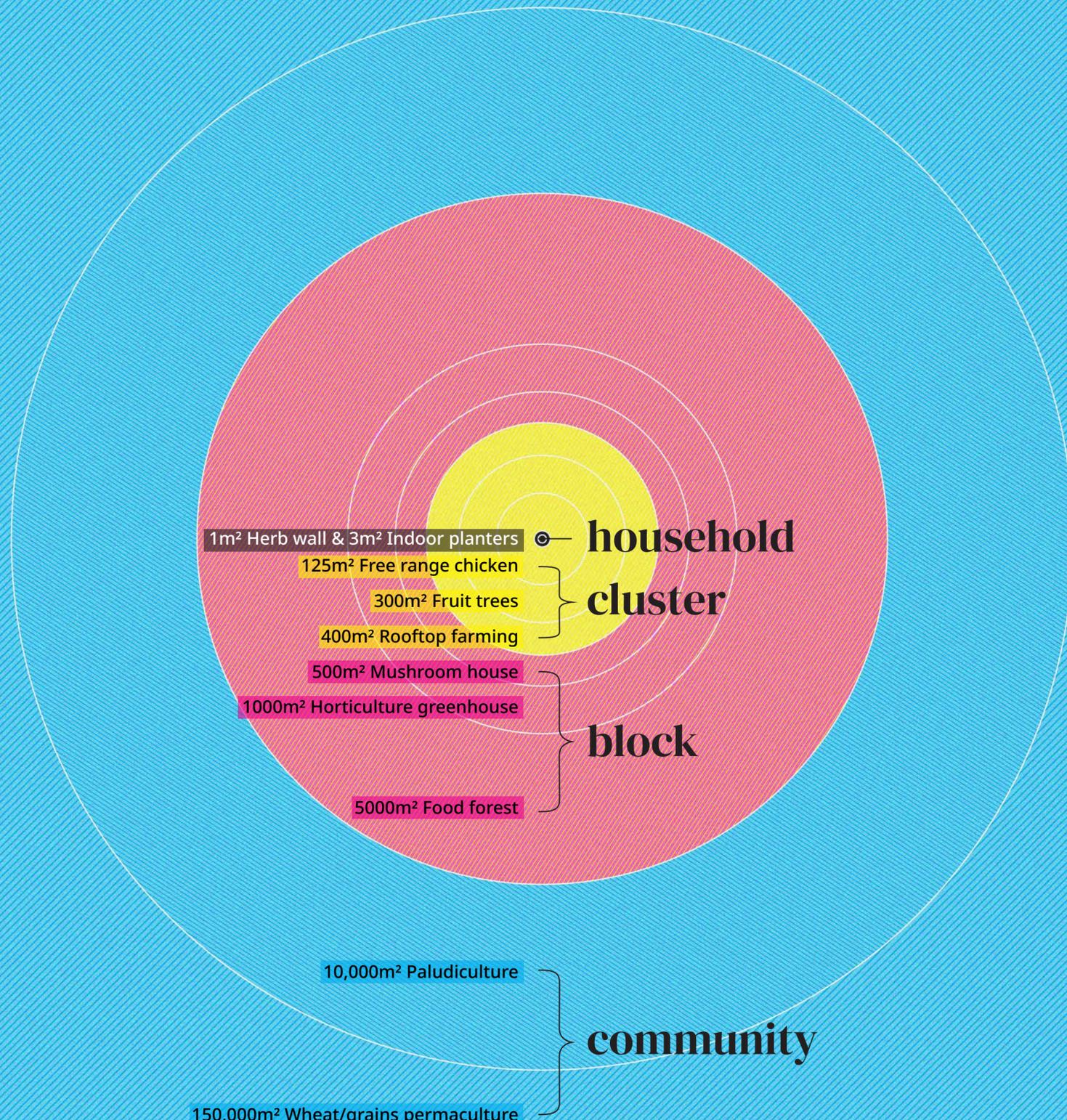
Von Thünen Model
(isolated state)

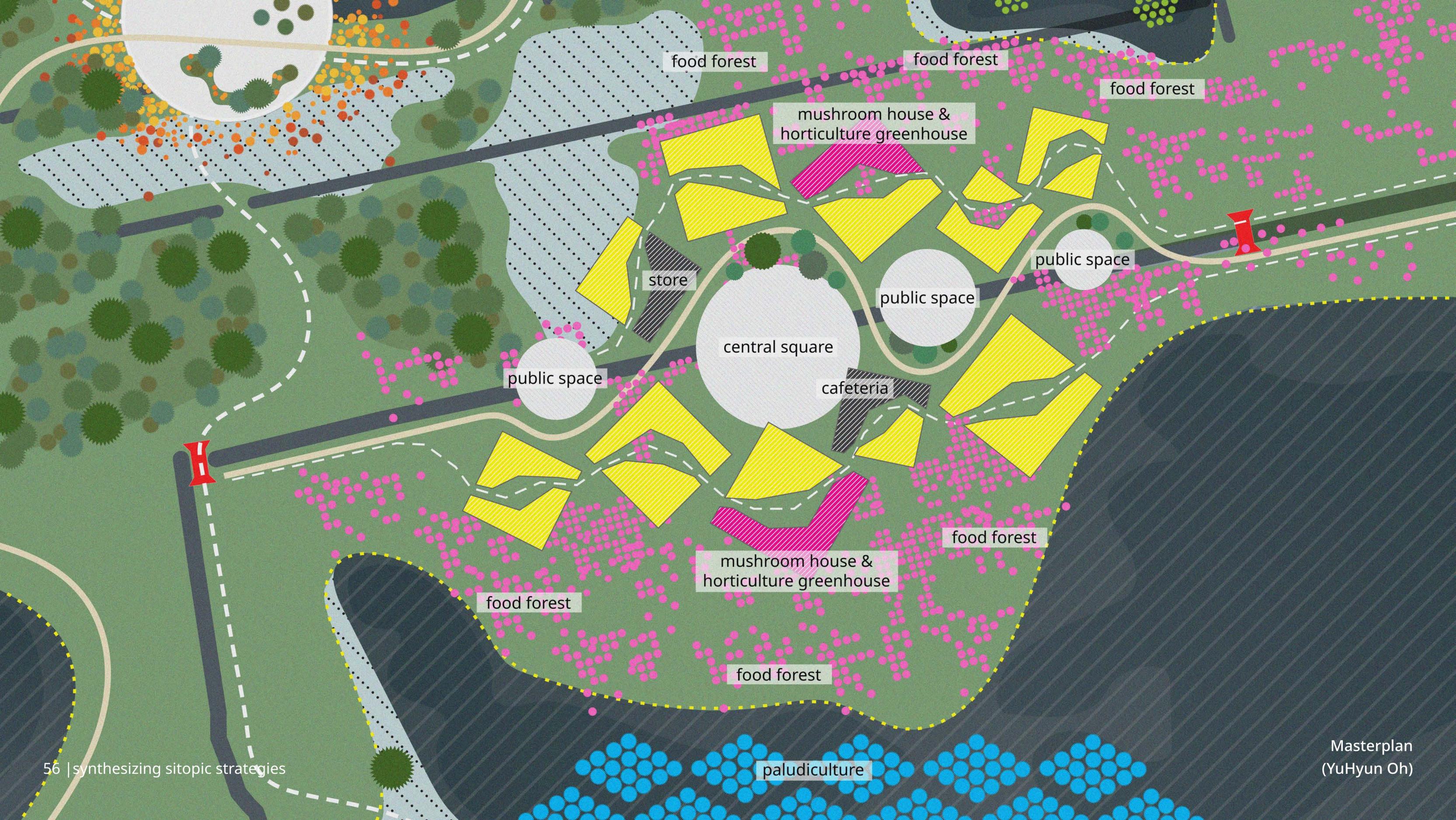


Model modified by River









food forest

food forest

food forest

mushroom house &
horticulture greenhouse

store

public space

public space

central square

public space

cafeteria

food forest

mushroom house &
horticulture greenhouse

food forest

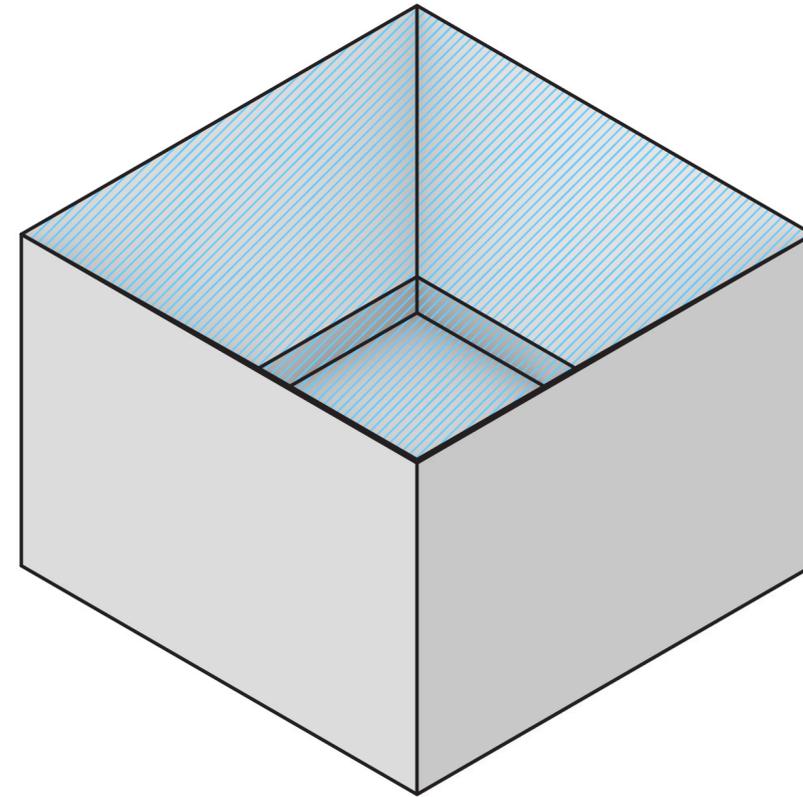
food forest

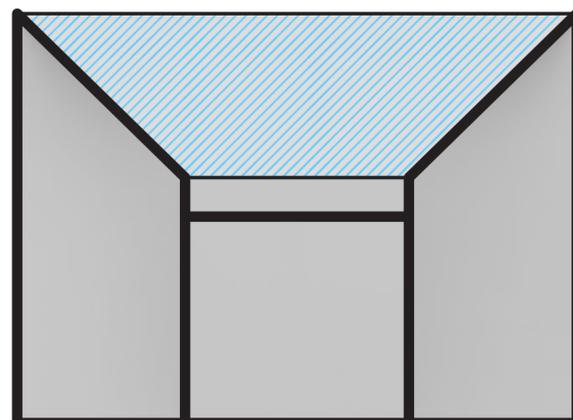
paludiculture

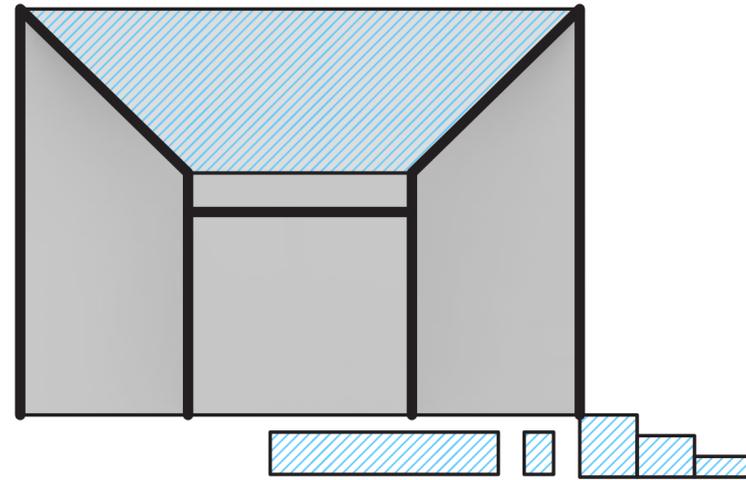


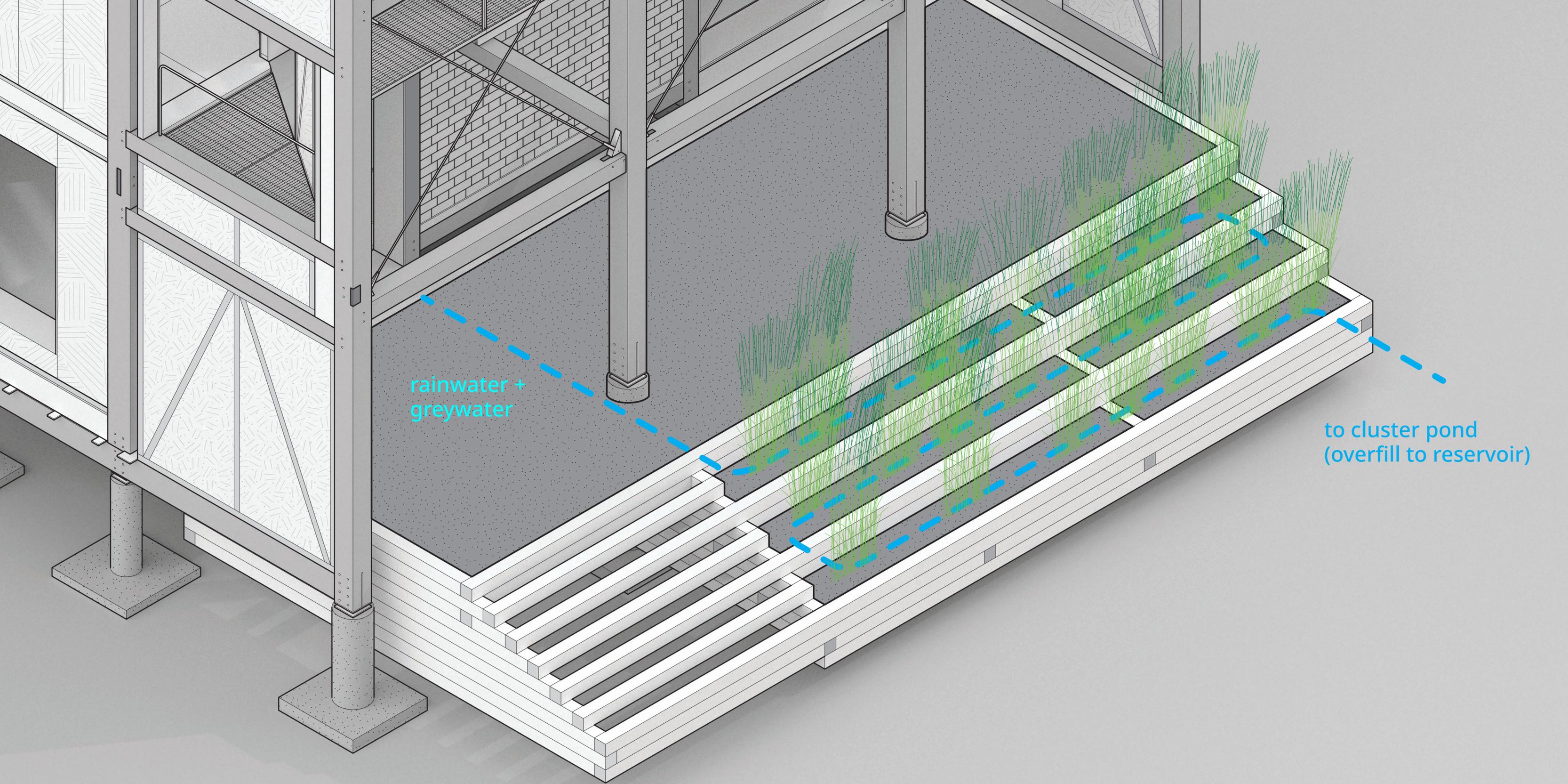






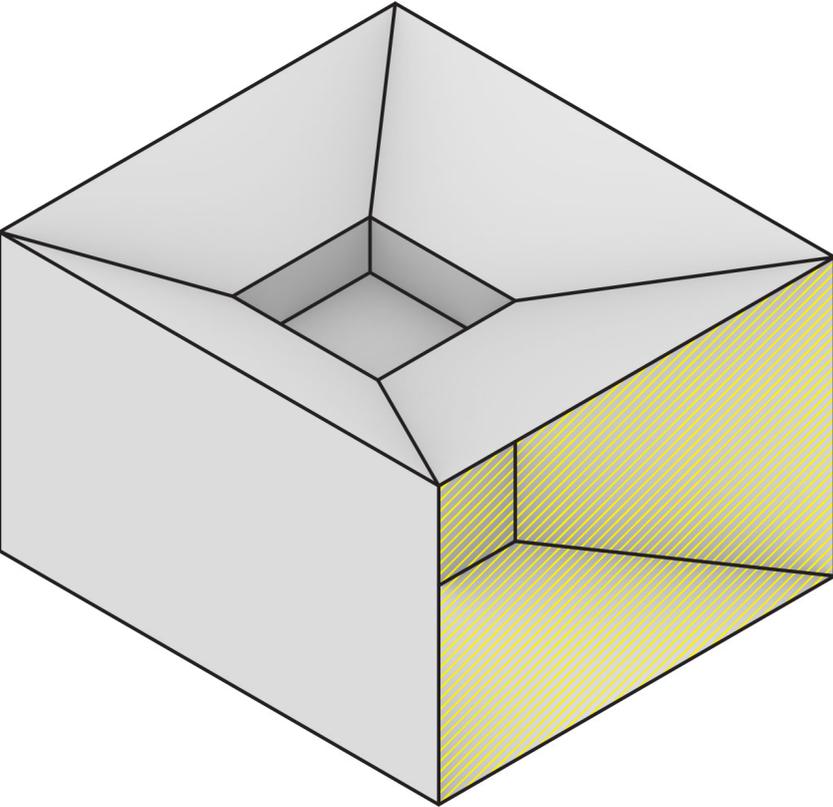


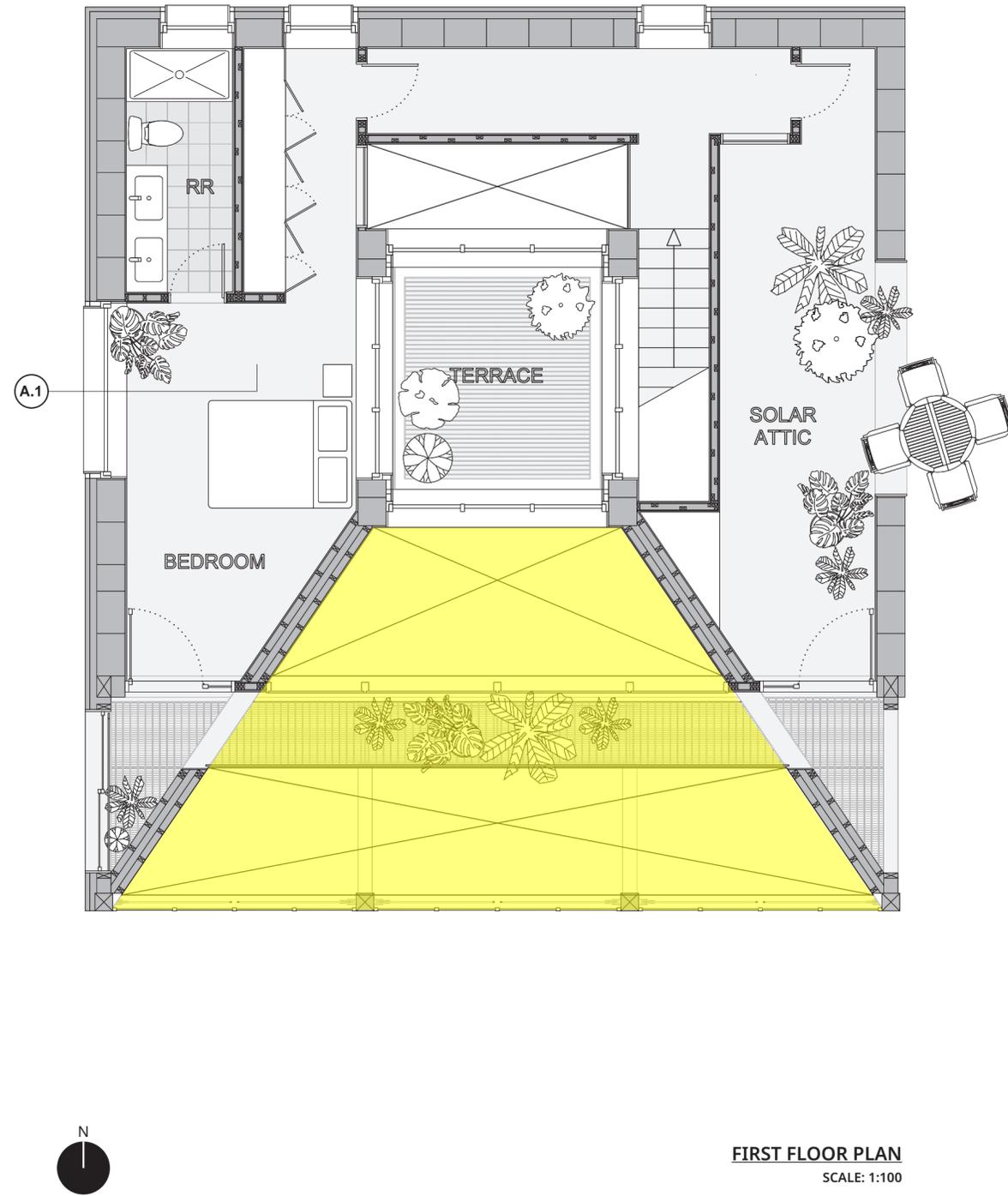
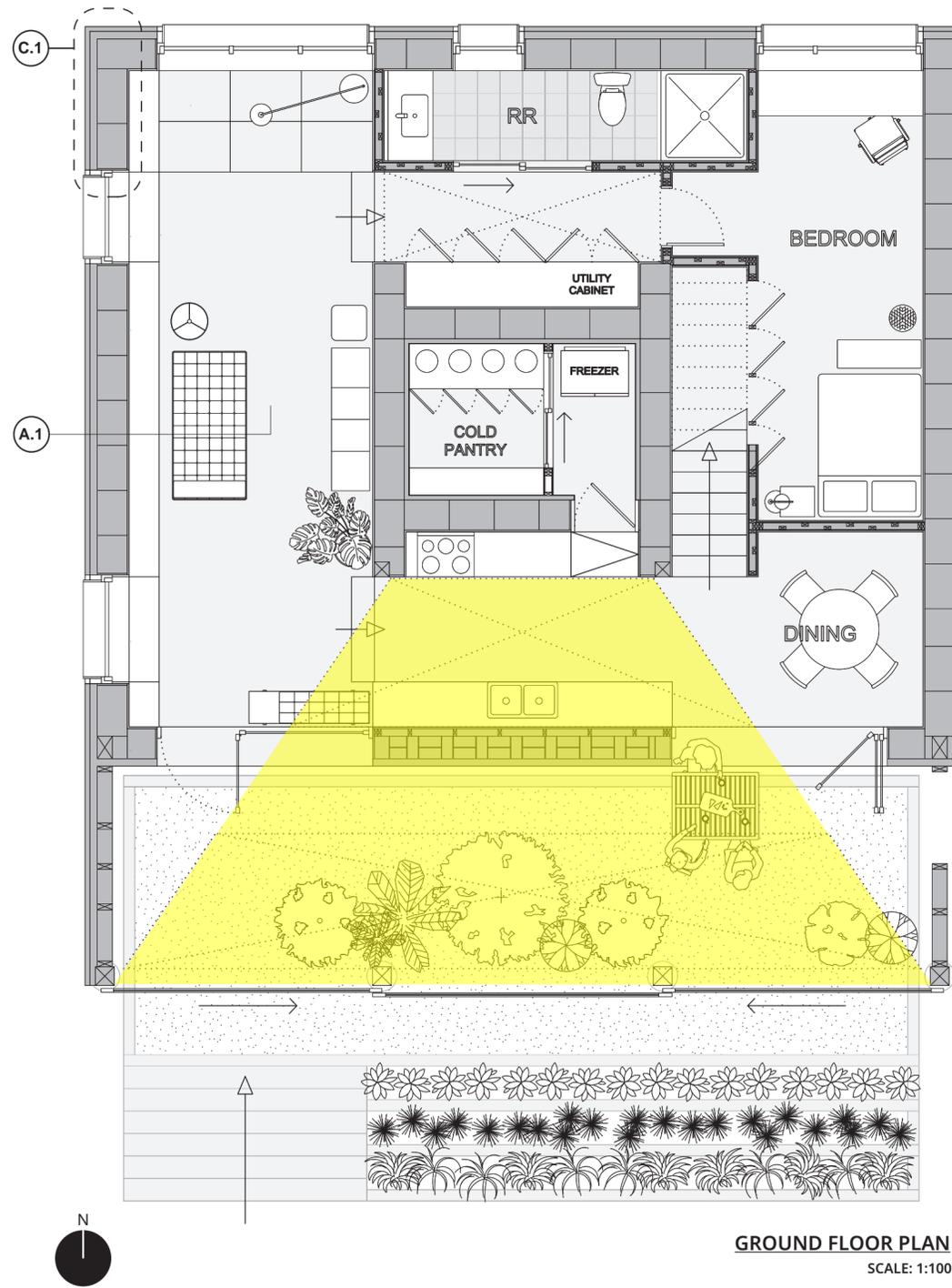


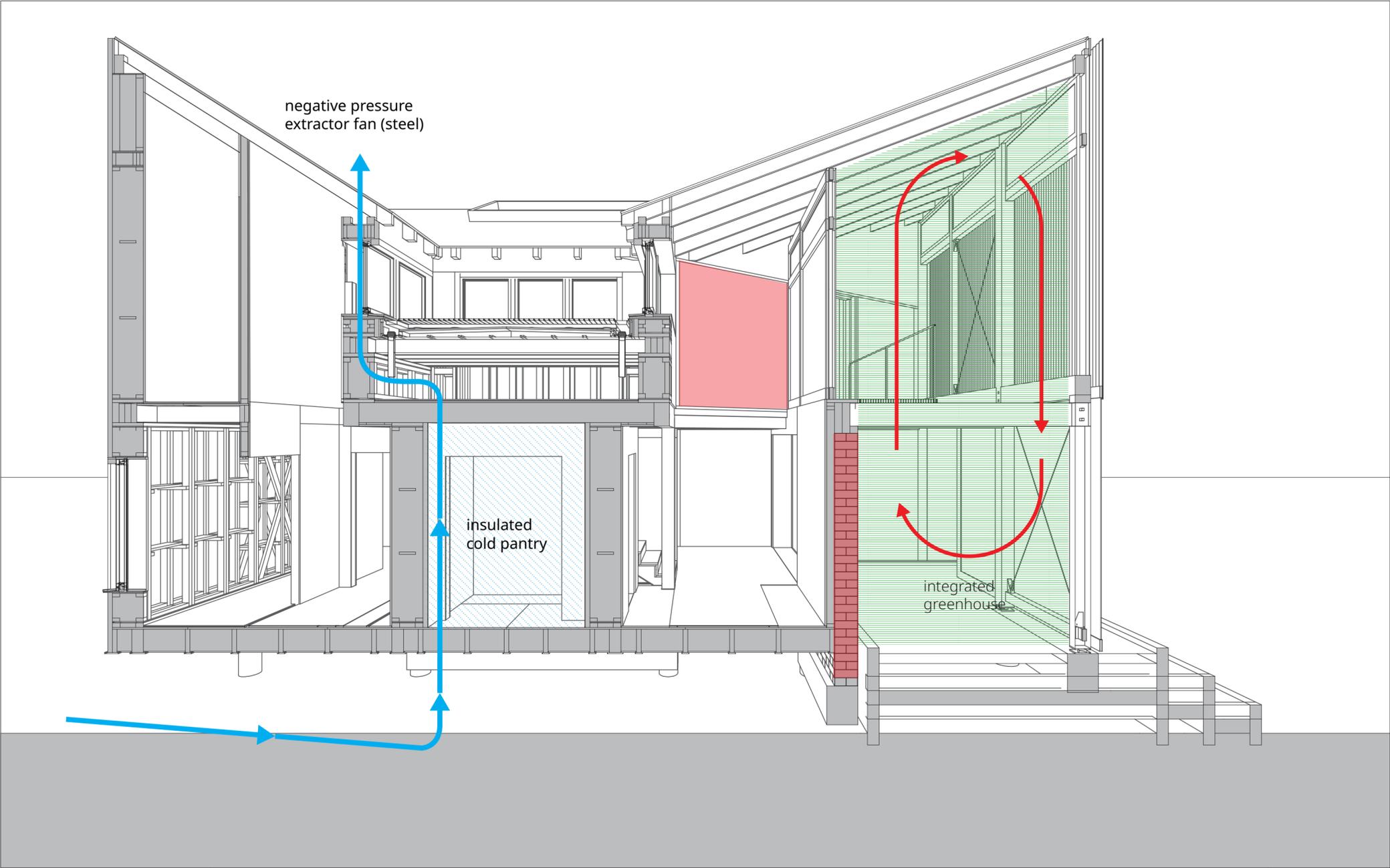


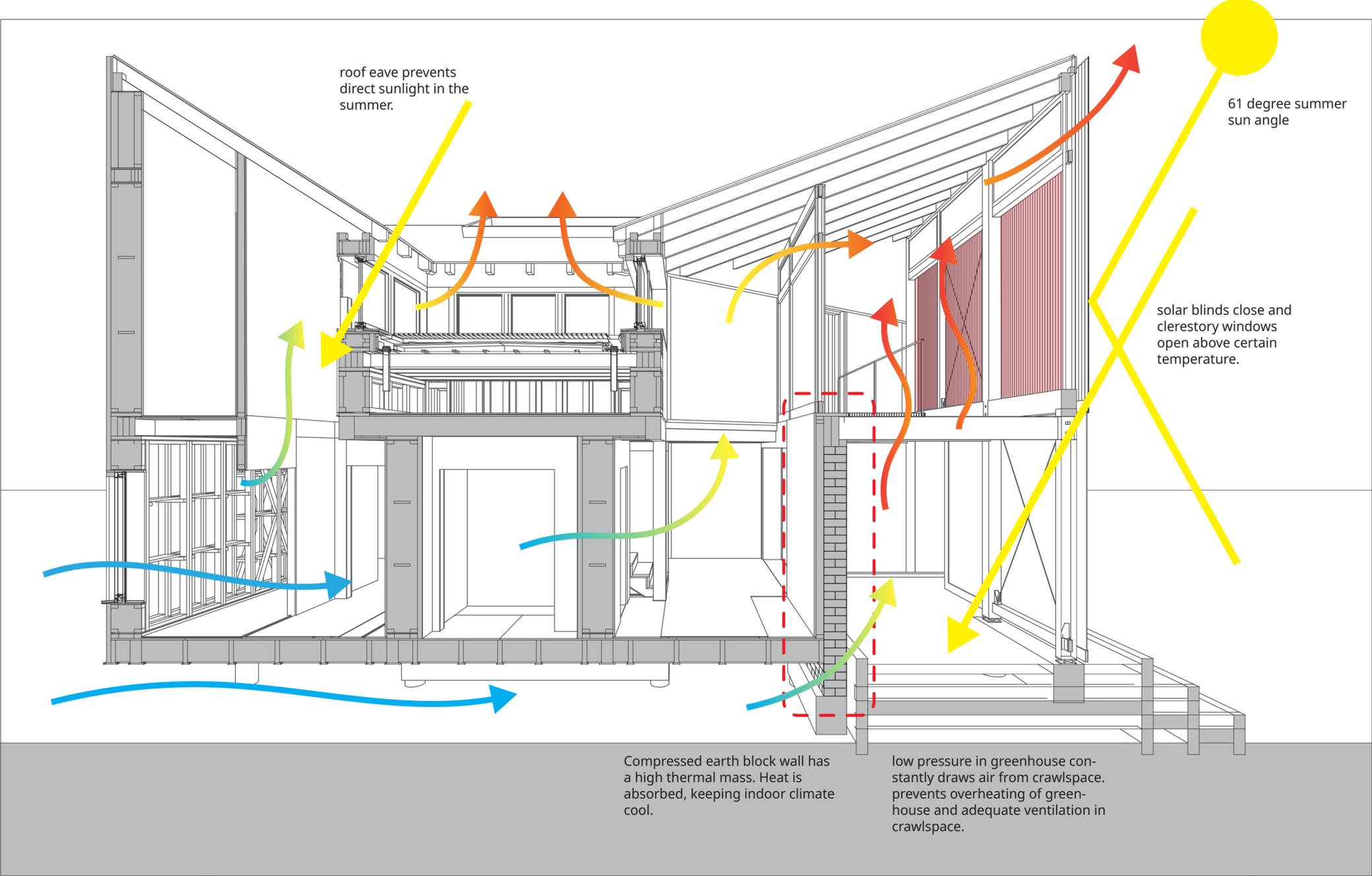
rainwater +
greywater

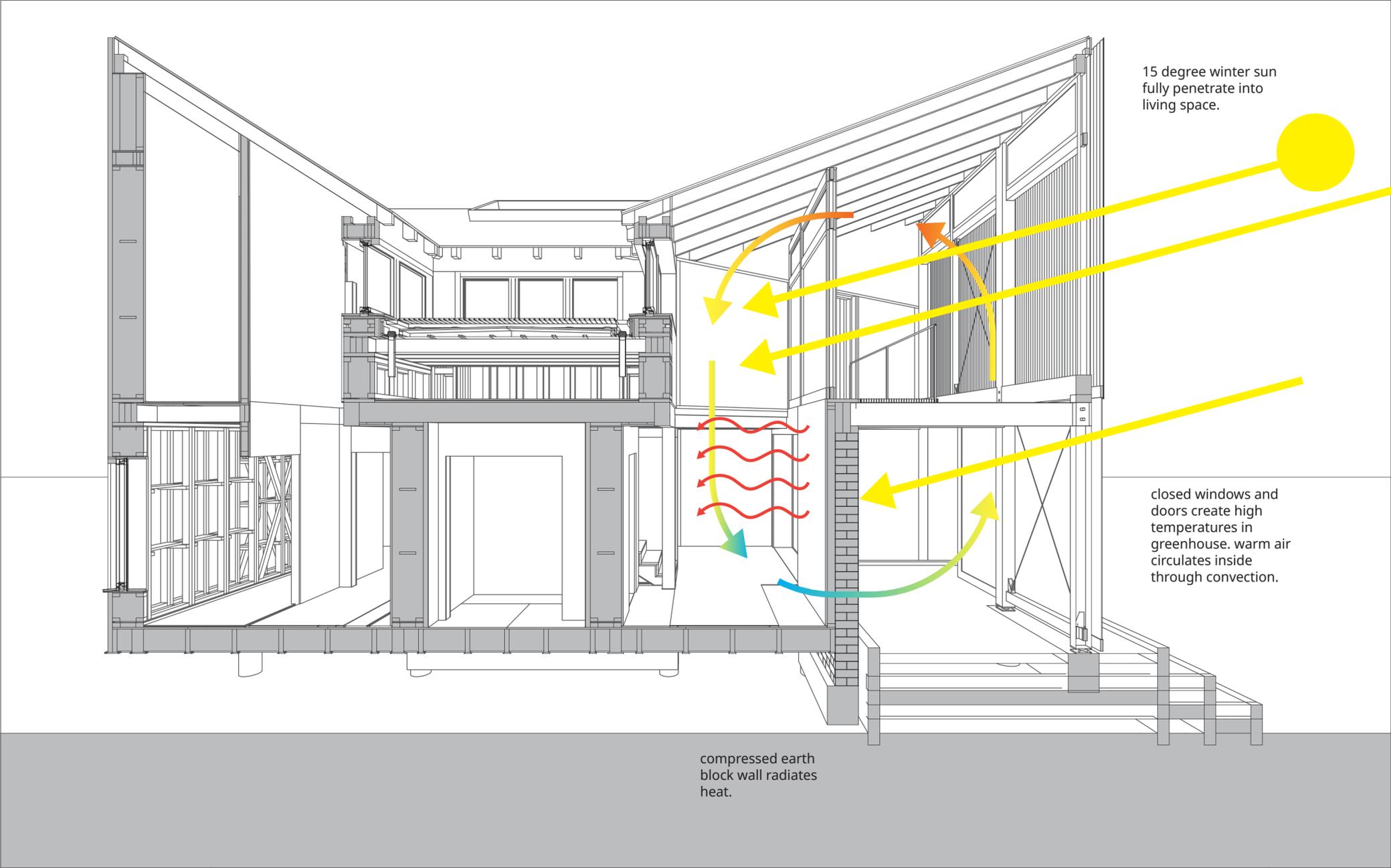
to cluster pond
(overflow to reservoir)

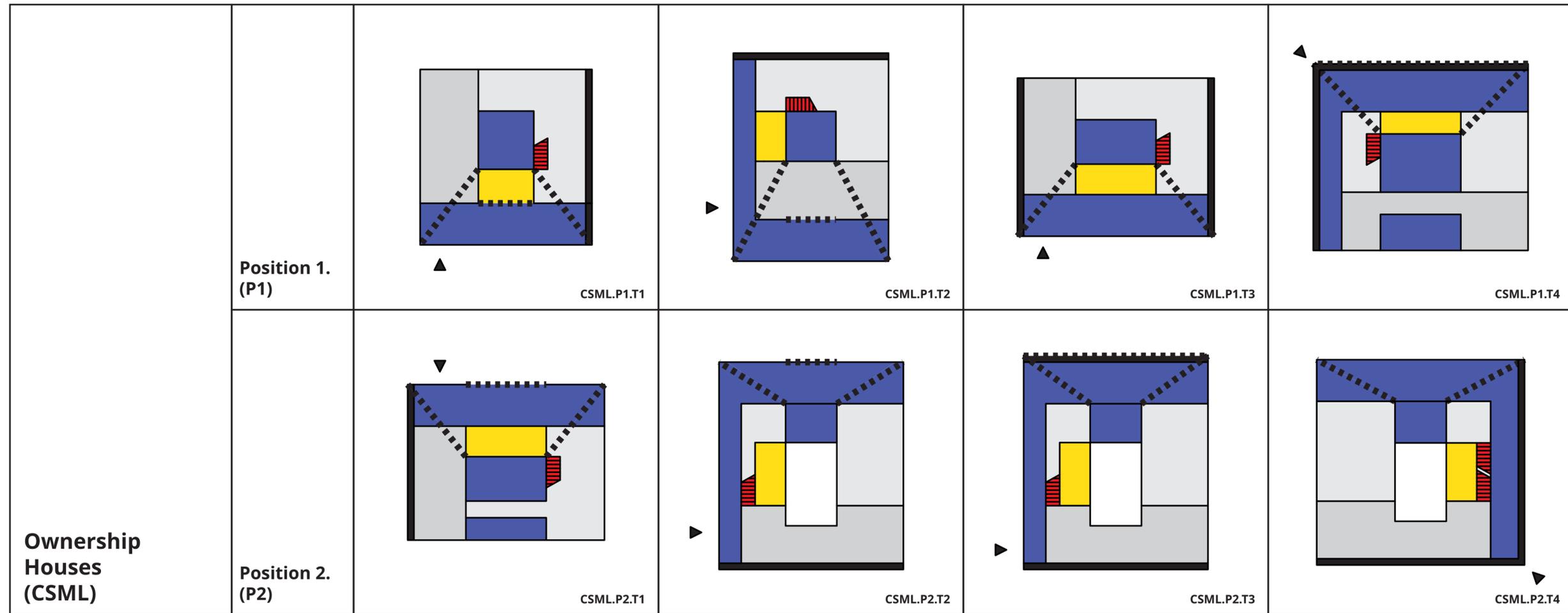












Tenure Model (RS, RSA, CSML)

Program of unit depends on the tenure model. Rental student housing units are grouped into "blocks" of six units. Rental studios and apartments units are grouped into blocks of three to four units. Co-ownership units are independent, and the number of rooms is inter-changeable with the size of the solar attic.

Position #. (P1, P2)

Position refers to a change of orientation of the unit within the cluster. This is either a directional change of the entryway or the adjacent block.

Type 1. (T1)

Type 1. blocks have a single adjacent block either to the east or the west. *All plans can be flipped on the vertical axis.

Type 2. (T2)

Type 2. blocks have a single adjacent block either to the north or the south. *All plans can be flipped on the vertical axis.

Type 3. (T3)

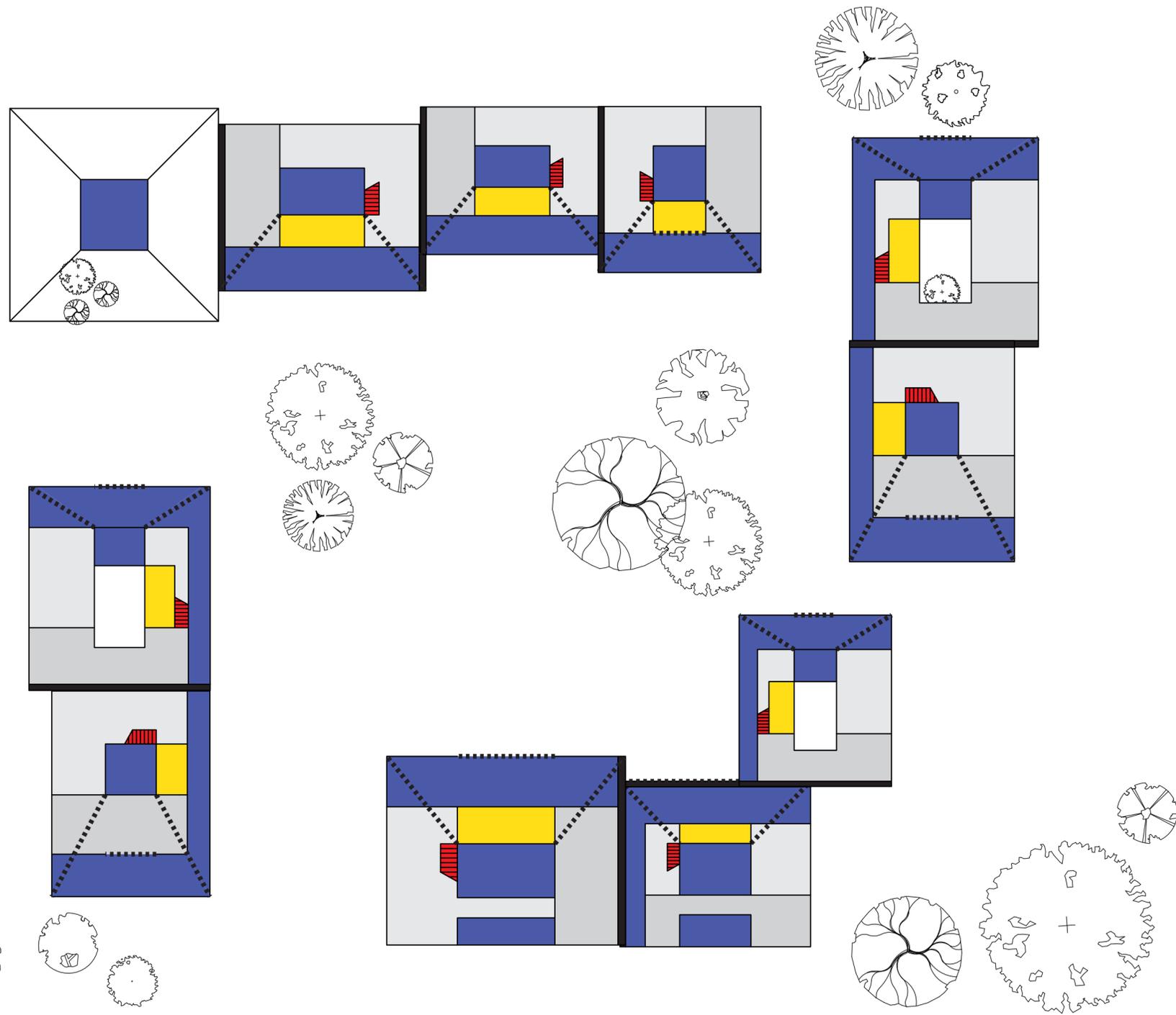
Type 3. blocks have double adjacent blocks either to the north and south or the east and west. *All plans can be flipped on the vertical axis.

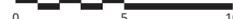
Type 4. (T4)

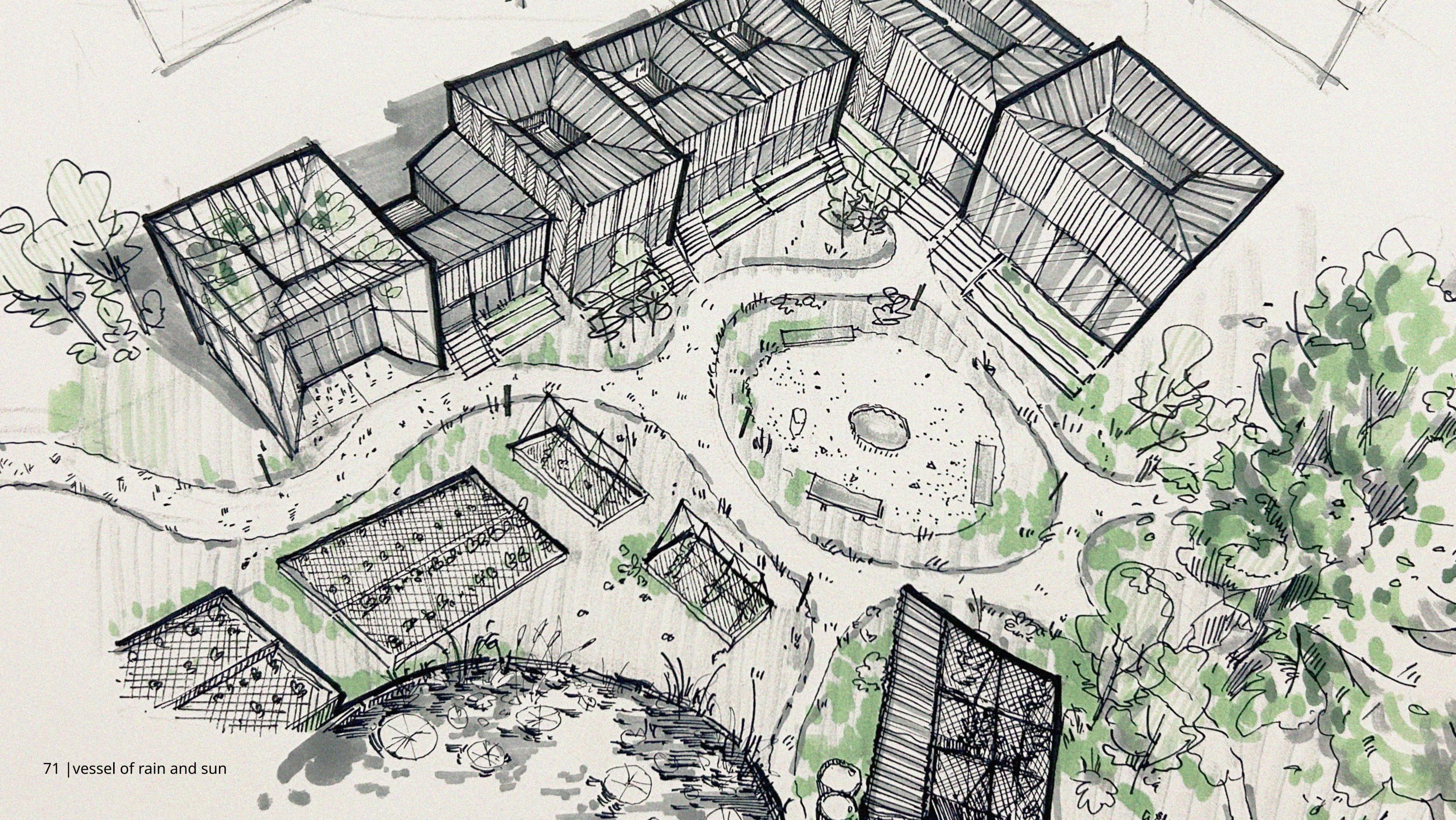
Type 4. blocks have double adjacent blocks on a corner. *All plans can be flipped on the vertical axis.



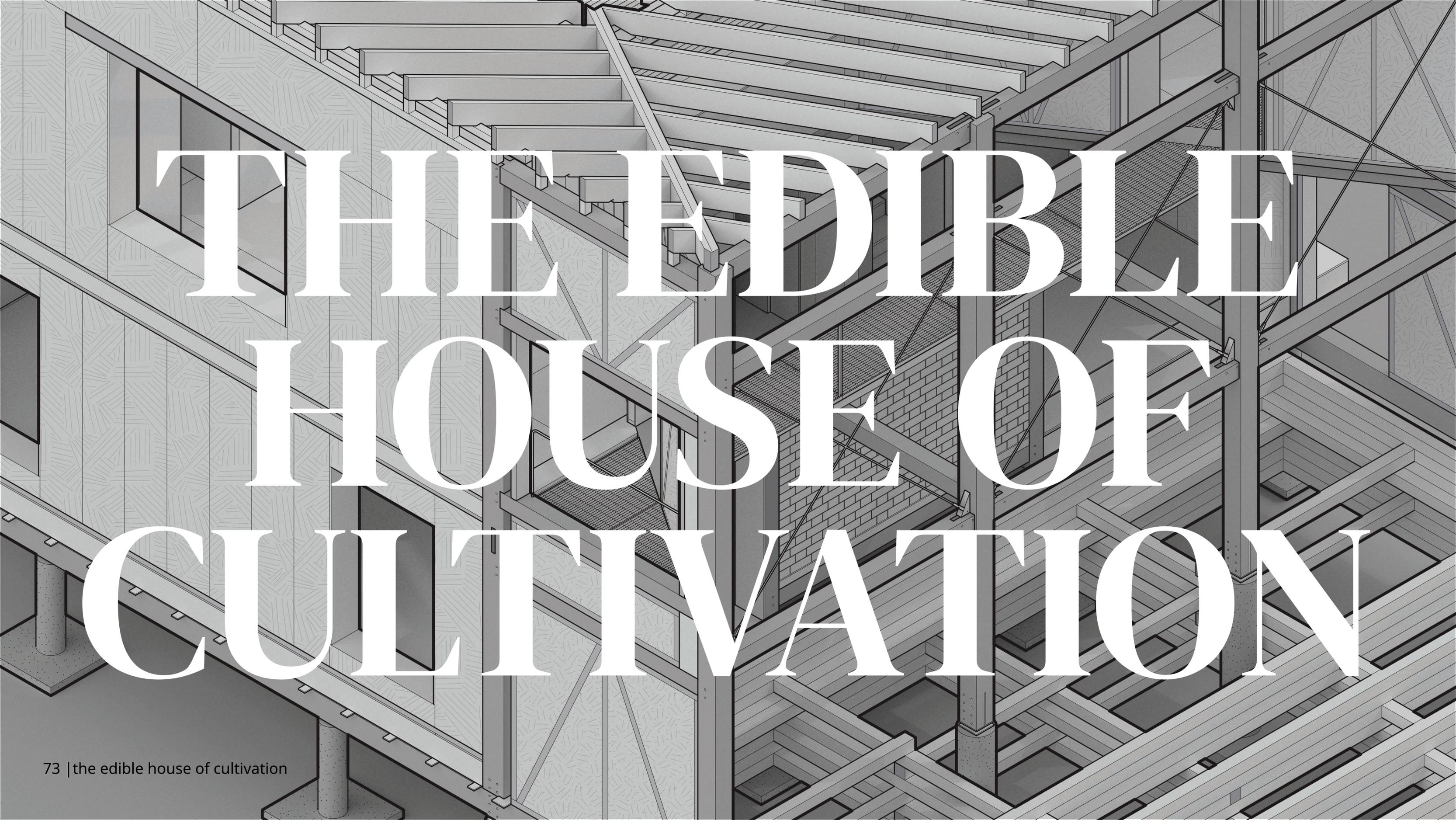
CLUSTER MODULATION





 greenhouse/terrace
 egress
 kitchen
 adjacent wall
 wattle & daub wall







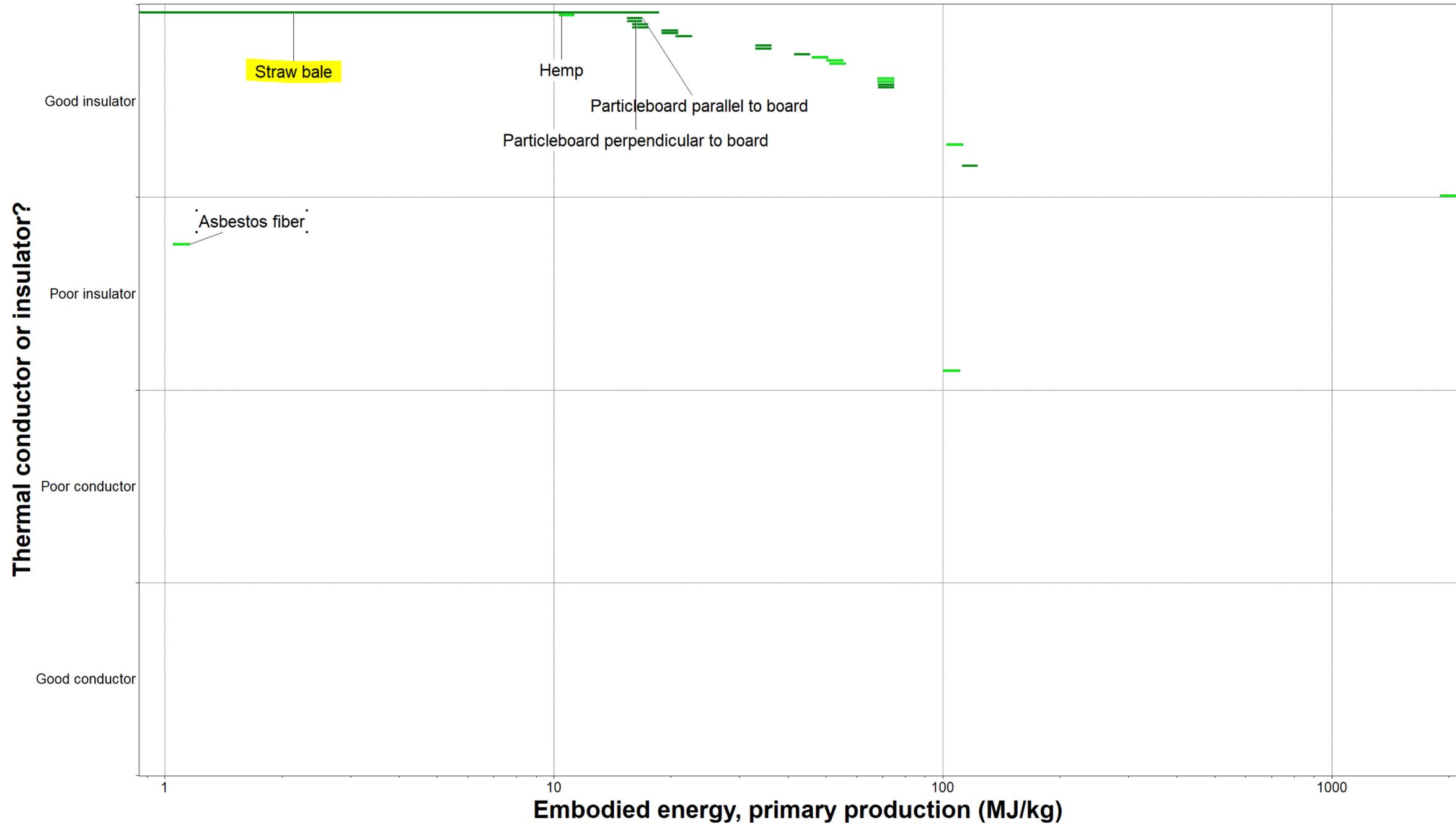
THE EDIBLE HOUSE OF CULTIVATION

Material	Min Density (kg/m3)	Max Density (kg/m3)	Avg Density (kg/m3)	Volume (m3)	Mass (kg)
Concrete (normal, Portland cement)	2200	2600	2400	12	28800
Glulam	500	650	575	4	2300
Plywood (7 ply, beech) parallel to face layer	700	800	750	4	3000
Structural Steel, S235J, wrought	7810	7890	7810	1	7810
Aluminium alloy, wrought (6061, T4)	-	-	-	-	150
Low-e glass	-	-	-	-	120
Phenolic Foam (closed cell, 0.120)	115	125	120	14	1680

Components

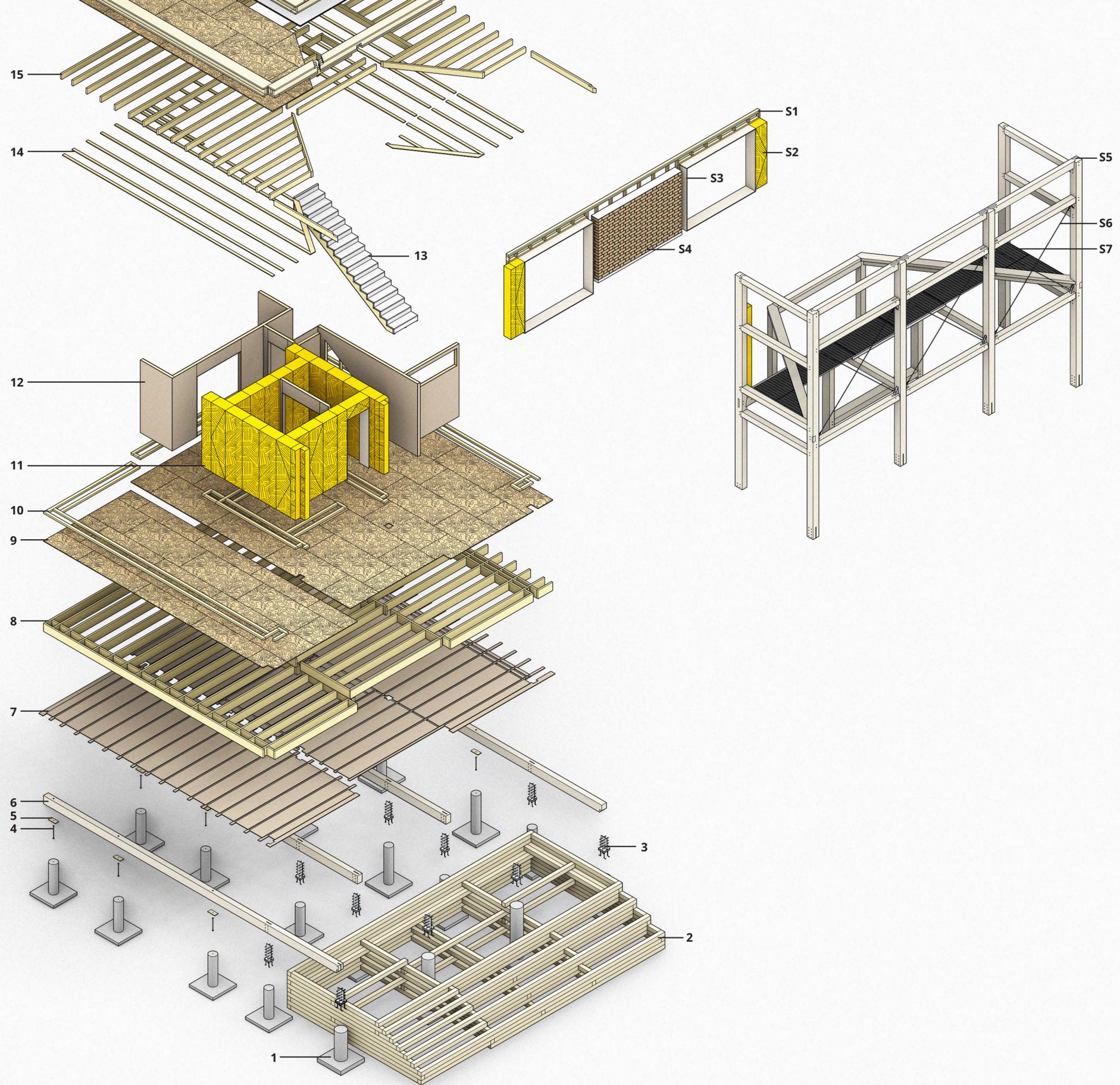
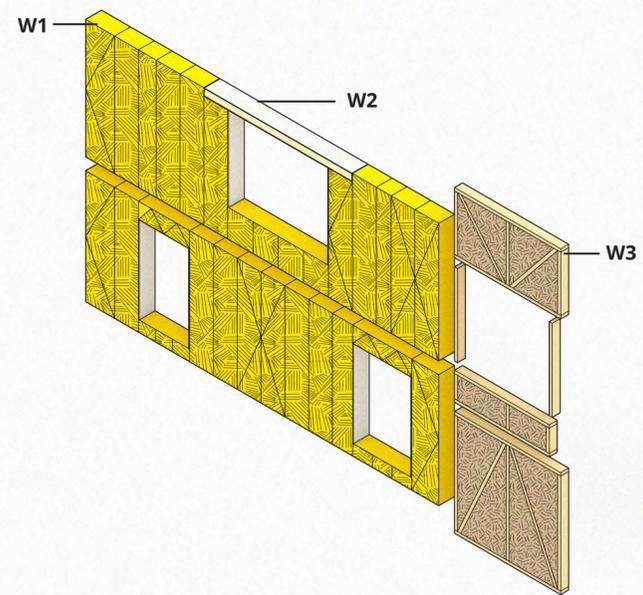
Qty.	Component name	Material	Recycled content	Mass (kg)	Primary process	Secondary process	% removed	End of life	% recovered
1		Concrete (normal, Portla...	Virgin (0%)	2.88e+04			0	Downcycle	80
1		Glulam	Virgin (0%)	2300			0	Reuse	50
1		Plywood (7 ply, beech)...	Virgin (0%)	3000			0	Combust	10
1		Structural steel, S235J	Virgin (0%)	7810			0	Recycle	90
1		Aluminum, 6061, T4	Virgin (0%)	150			0	Recycle	90
1		Low-e glass	Virgin (0%)	120			0	Reuse	50
1		Phenolic foam (closed...	Virgin (0%)	1680			0	Landfill	10

Component	Material	Recycled content* (%)	Part mass (kg)	Qty.	Total mass processed** (kg)	Energy (MJ)	%
	Concrete (normal, Portland cement)	Virgin (0%)	2.9e+04	1	2.9e+04	2.9e+04	4.5
	Glulam	Virgin (0%)	2.3e+03	1	2.3e+03	1e+05	15.9
	Plywood (7 ply, beech), parallel to face layer	Virgin (0%)	3e+03	1	3e+03	1e+05	16.5
	Structural steel, S235J	Virgin (0%)	7.8e+03	1	7.8e+03	2e+05	32.3
	Aluminum, 6061, T4	Virgin (0%)	1.5e+02	1	1.5e+02	2.6e+04	4.1
	Low-e glass	Virgin (0%)	1.2e+02	1	1.2e+02	2.2e+03	0.3
	Phenolic foam (closed cell, 0.120)	Virgin (0%)	1.7e+03	1	1.7e+03	1.6e+05	26.3
Total				7	4.4e+04	6.3e+05	100





biodegradable
lightweight
low embodied energy
affordable
locally sourced
vapor-permeable



What strategies can effectively integrate
food production and preparation¹
within residential communities²
to develop a sustainable food system?³

**If the food system is to change,
the place to begin is home.**