Praga

where modernity meets wastelands

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Experimental Wood Workshop
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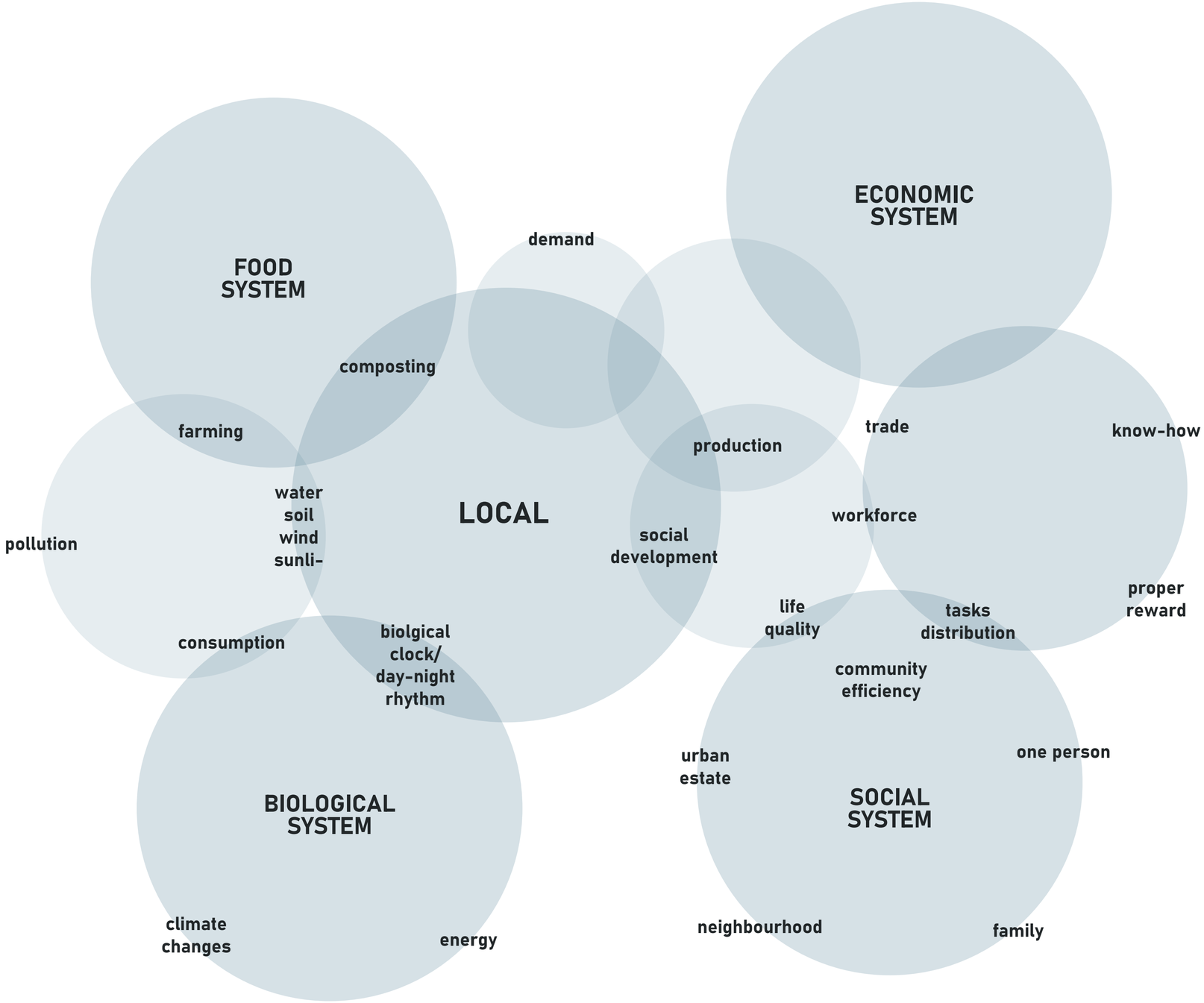
*** The design proposal is a conceptual solution. It aims to encourage discussion about urban vacancies rather than being the basis for a real solution of the problem.**

Local Vision

Scenario

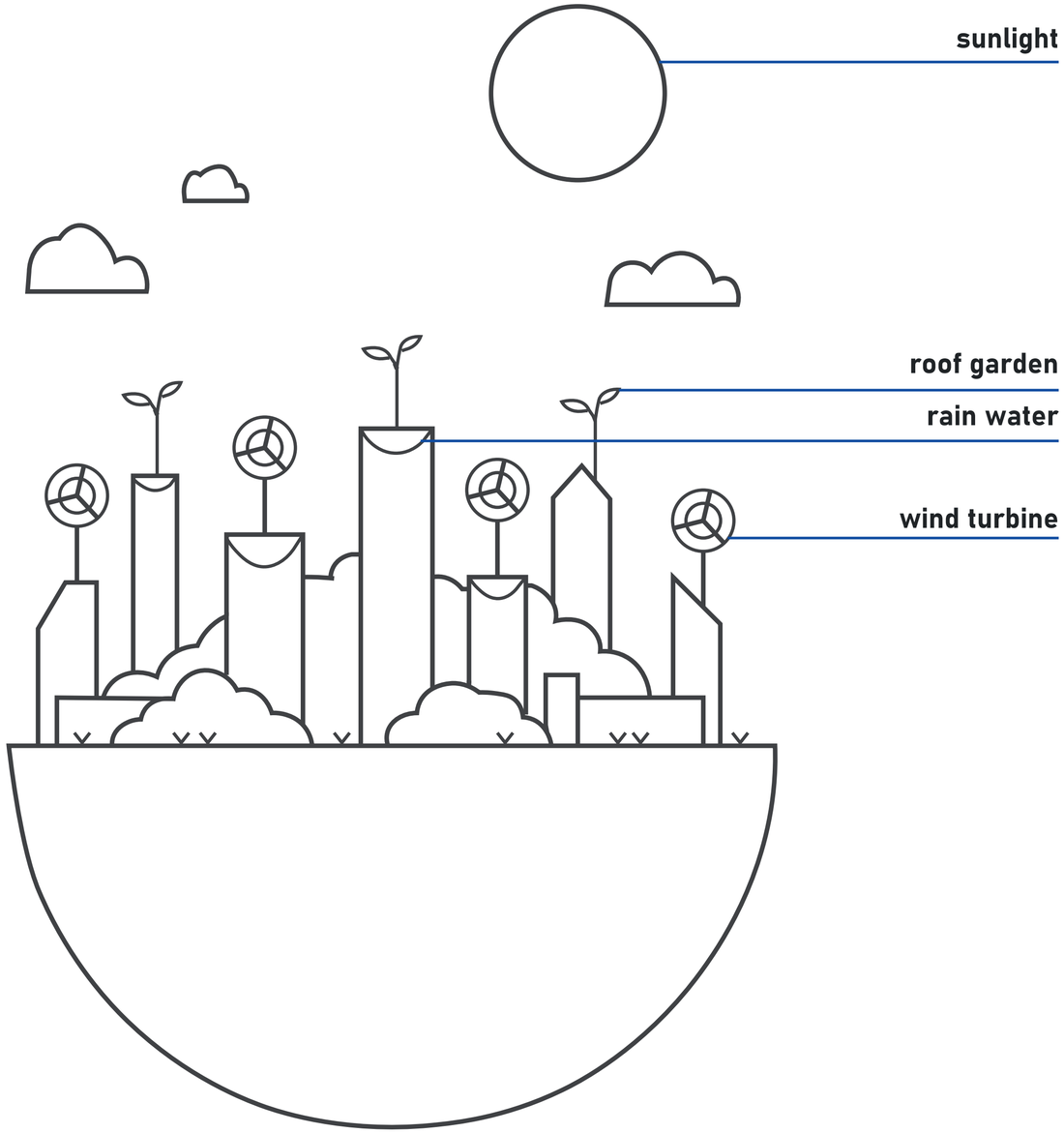

FOOD SYSTEM
ECONOMIC SYSTEM
demand
composting
farming
production
trade
know-how
water
soil
wind
sunli-
LOCAL
workforce
pollution
social development
proper reward
life quality
tasks distribution
consumption
biolgical clock/ day-night rhythm
community efficiency
urban estate
one person
BIOLOGICAL SYSTEM
SOCIAL SYSTEM
climate changes
energy
neighbourhood
family

Alternative Solution

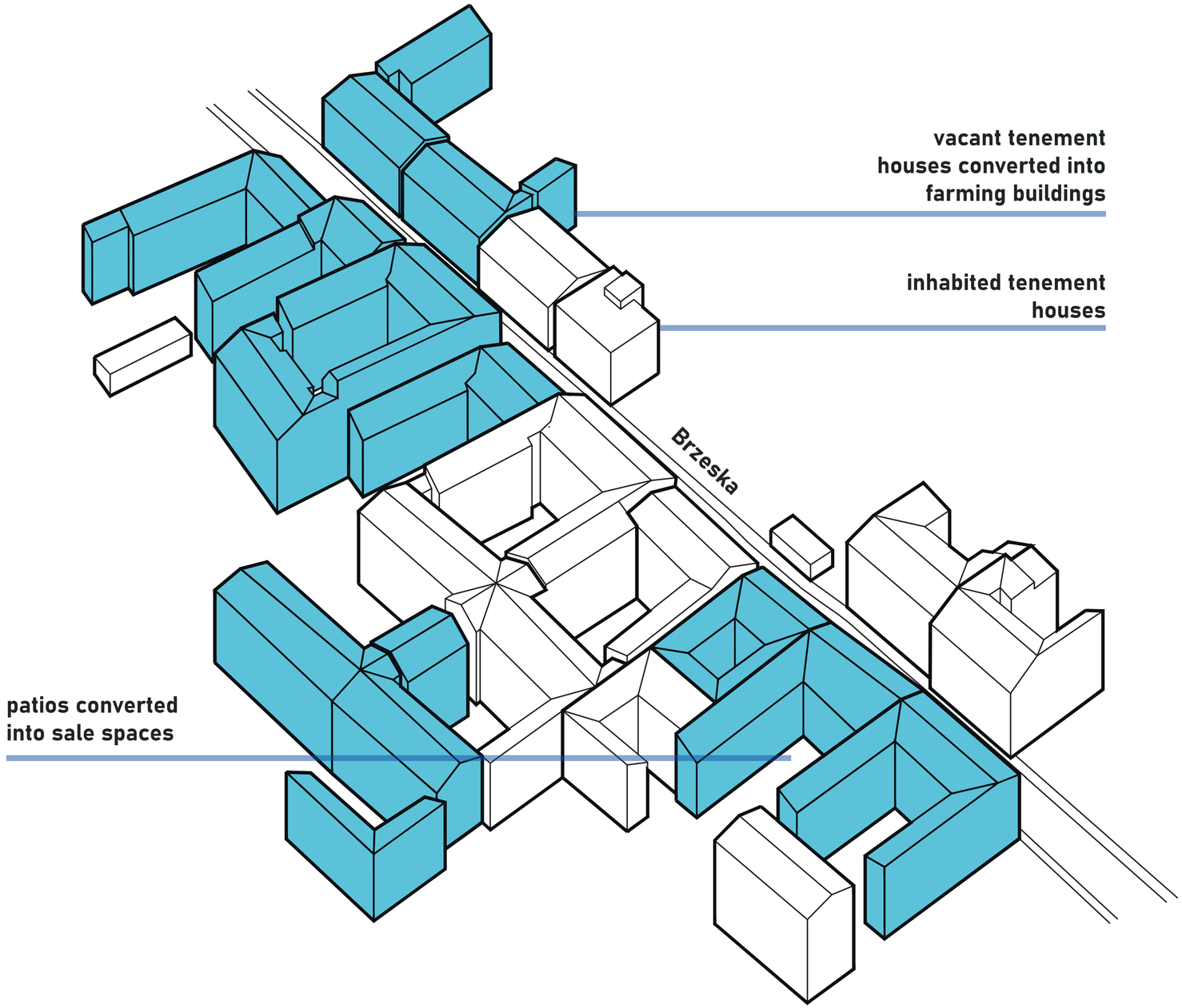
Aquaponics district

self-sufficient farming during the whole year

Aquaponics is a system that combines conventional aquaculture (raising aquatic animals such as snails, fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment.
Literally speaking, aquaponics is putting fish to work. It just so happens that the work those fish do (eating and producing waste), is the perfect fertilizer for growing plants.

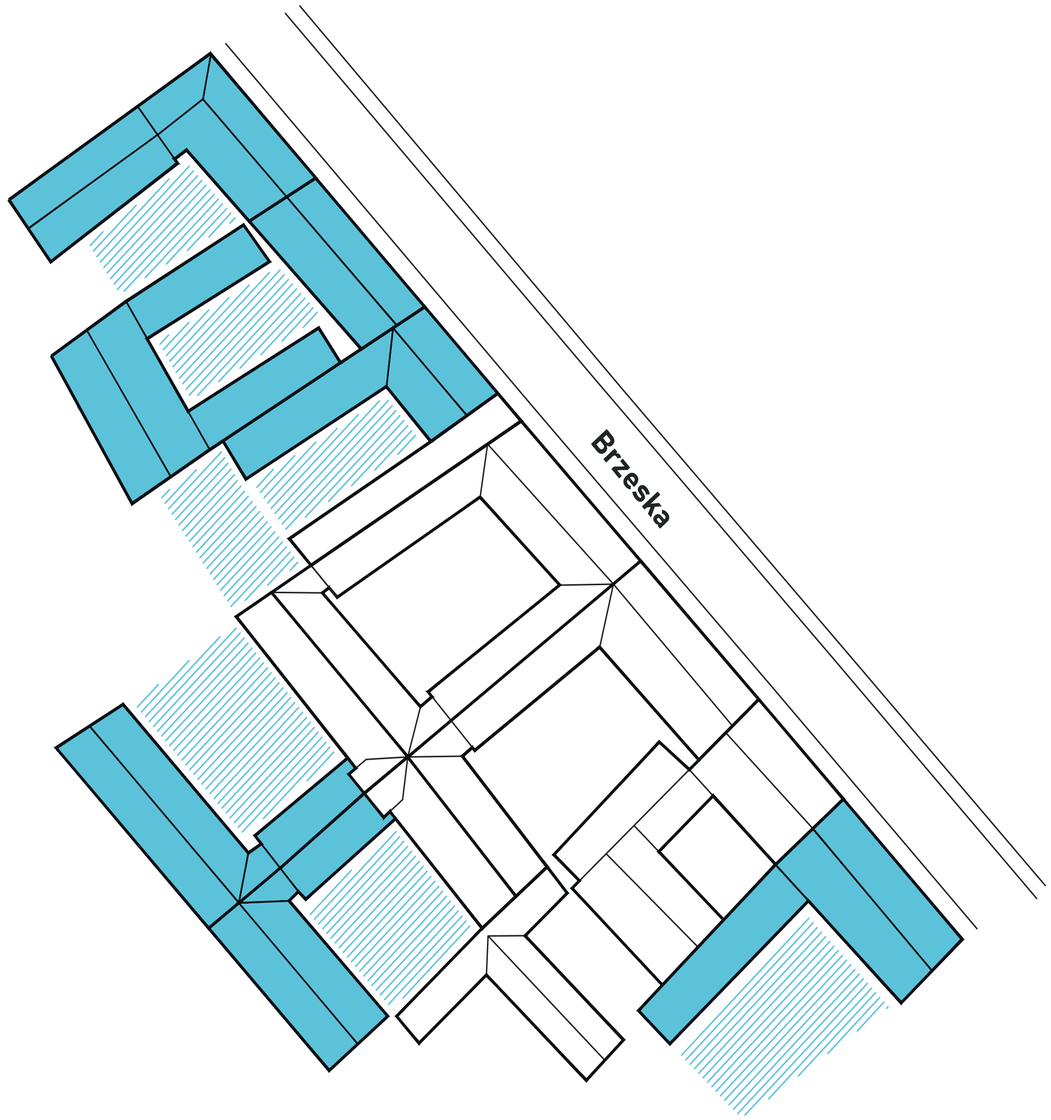


Aquaponics Praga



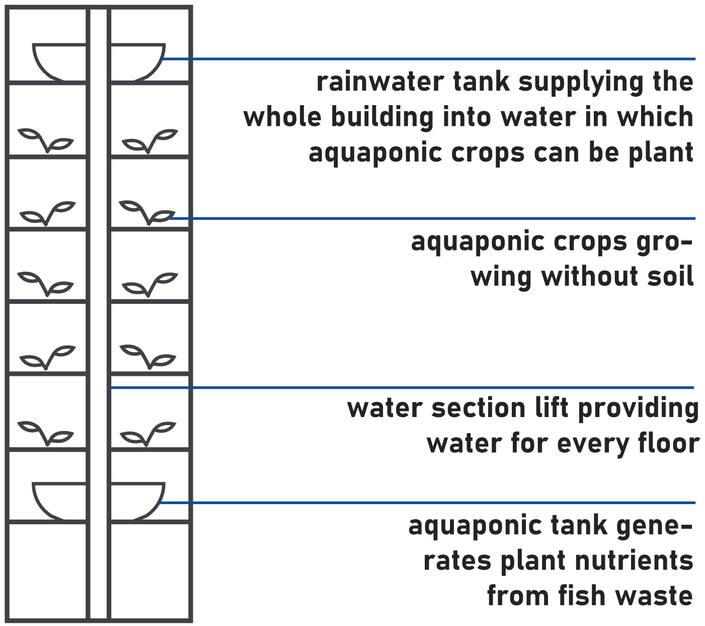
Urban management of vacant spaces

– vacant space divided into separate area for harvesting different kind of plants
- repeatable spatial management
- communication space between cultivated rooms
- lift dedicated to supplying crops
- enlargement of glass surfaces to catch as much sun power as possible



Aquaponic circular system

Adapted in architectural scale as a vertical farming building



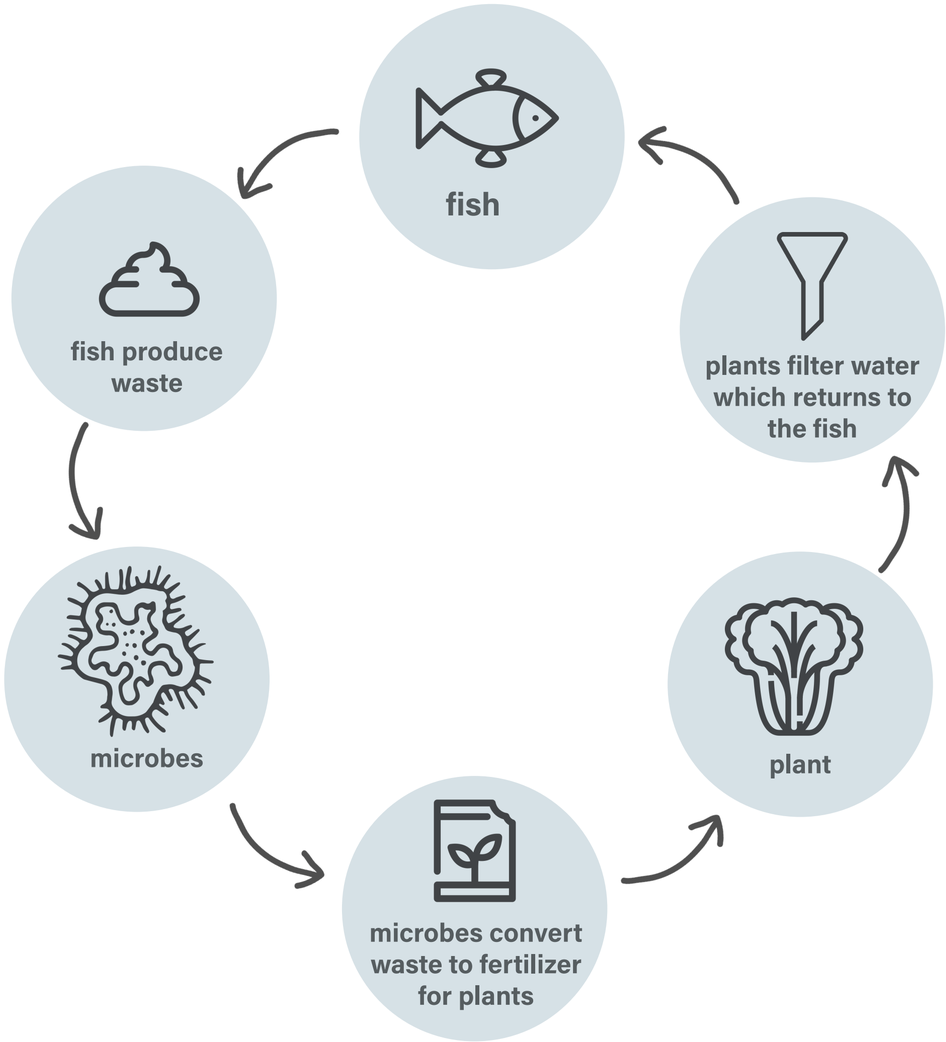
rainwater tank supplying the whole building into water in which aquaponic crops can be plant

aquaponic crops growing without soil

water section lift providing water for every floor

aquaponic tank generates plant nutrients from fish waste

* if it is still a residential building in some floors - filtered, sterilized wastewater from sewage system can be used for irrigation



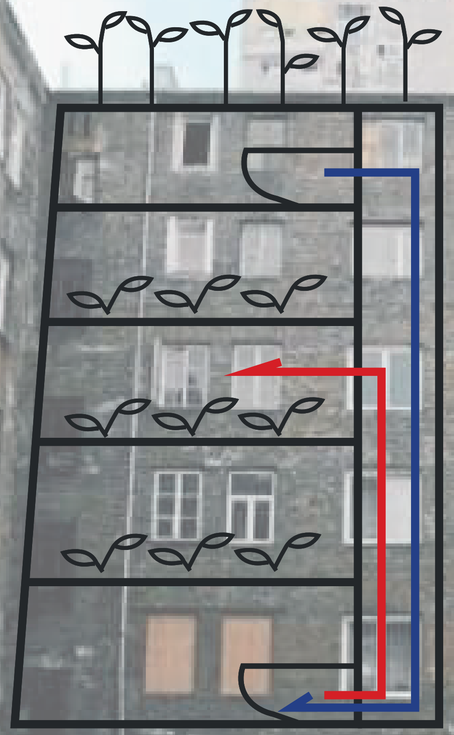
Praga vacant buildings

as a space for aquaponic vertical farming

rain water tank

layers of aquaponic crops growing without soil

aquaponic tank containing plant nutrients from fish waste



roof gardening

water from rain tank provides

water with nutrients for watering plants

- vacant space divided into separate area for harvesting different kind of plants
- repeatable spatial management
- communication space between cultivated rooms
- lift dedicated to supplying crops
- enlargement of glass surfaces to catch as much sun power as possible

Monthly consumption of different products / per person | Masovian Voivodeship, 2018:

fruits – 3,75 kg
vegetables – 7,92 kg
potatoes – 2,97 kg

Annual consumption of different products / per person | Masovian Voivodeship, 2018:

fruits – 45 kg
vegetables – 95,04 kg
potatoes – 35,64 kg

Basic aquaponic system data | for 12m2 surface:

– 140 heads of lettuce or different plants / per year = 35 kg of crops / per year
- 0,5-1 h system support / per day
- 50 kg of fish waste which is convert into fertilizer by microbes per year

Annual consumption of plant products / per person | Masovian Voivodeship, 2018 – 175,68 kg

175,68 kg / 35 kg = 5
5 x 12m2 = 60m2 – surface needed to provide plant products / per person for a year

Aquaponics day to day operation:

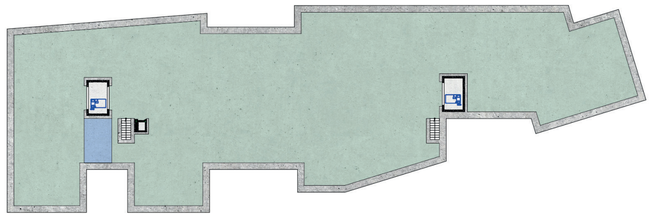
– fish feeding
- plant seeding and rotation
- plant harvesting
- fish harvesting
- water quality testing
- cleaning filters and whole system

Most common plants suitable for growing in aquaponic system:

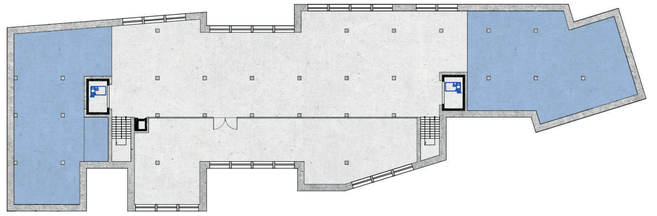
- tomatoes
- lettuce
- watercress
- peppers
- cucumbers
- cauliflower
- cabbage
- strawberries
- broccoli
- beans
- squash
- peas
- bananas
- citrus
- ginger
- basil

Functional management

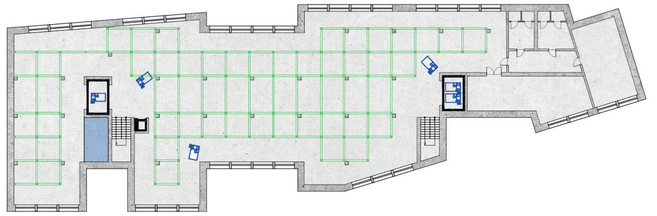
Rooftop floor
- rooftop garden open for local community
- rainwater inlet



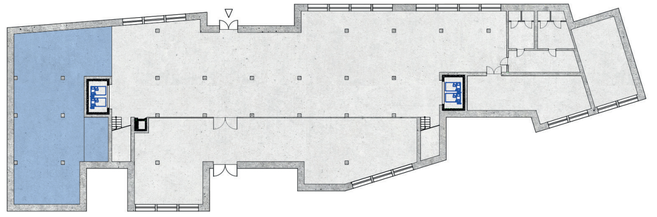
IV floor
- rainwater tank supplying the whole building into water in which aquaponic crops can be plant
- water storage tank in case of a longer rainless period to avoid interruptions in the supply of water to crops
- magazine



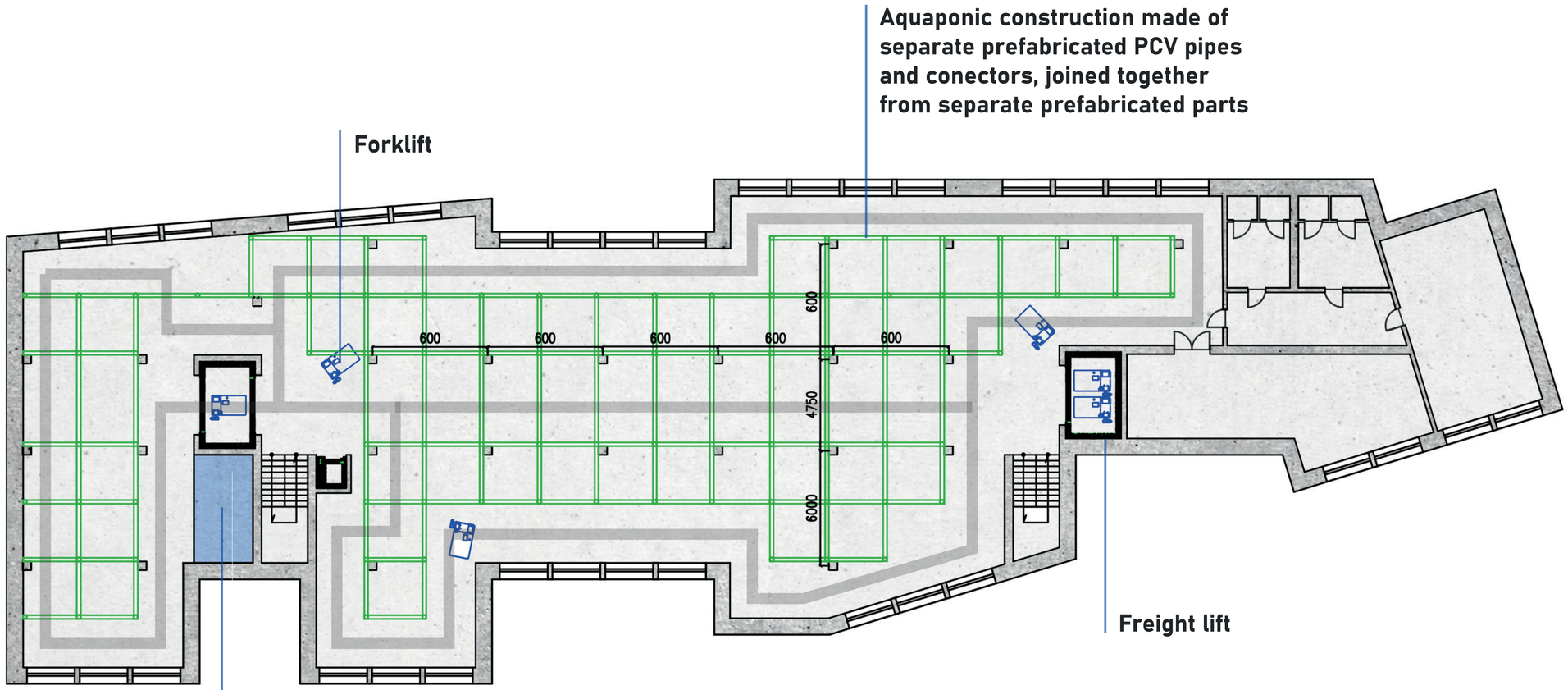
I, II, III floor
- 3 floors with a repetitive spatial management, dedicated to aquaponic cultivation growing withour soil and supplying fresh products for the local community without the need to import them from further
- magazine



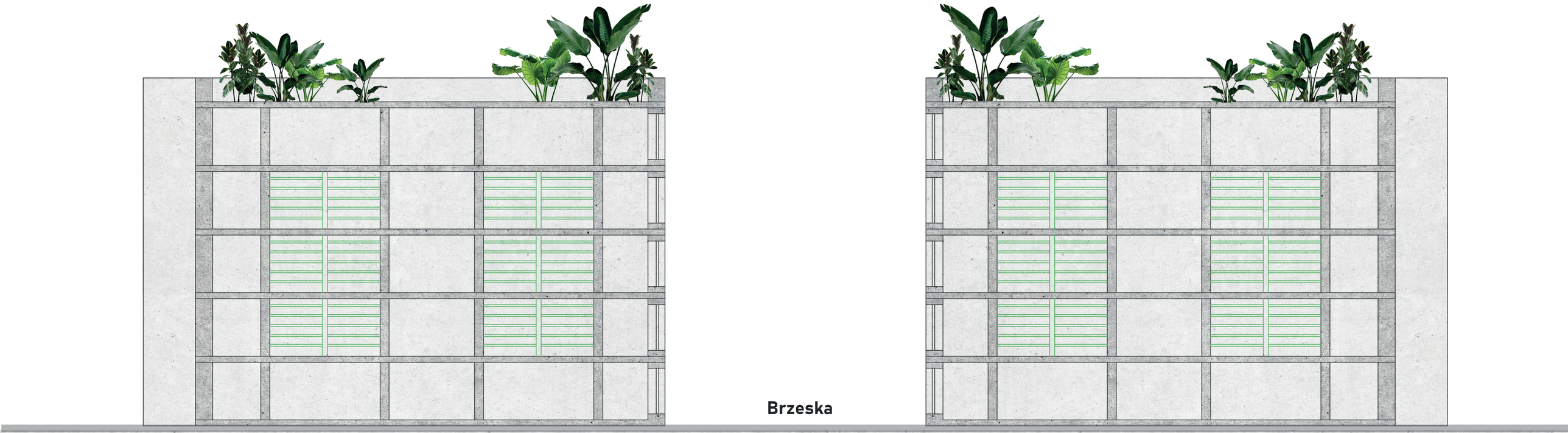
0 floor
- aquponic tank generates plant nutrients from fish waste
- sales space as aquaponic system. where local community can buy fresh vegetables and fruits and straight from the water bed and observe in smaller scale how the system works
- magazine



Aquaphonic crops floor



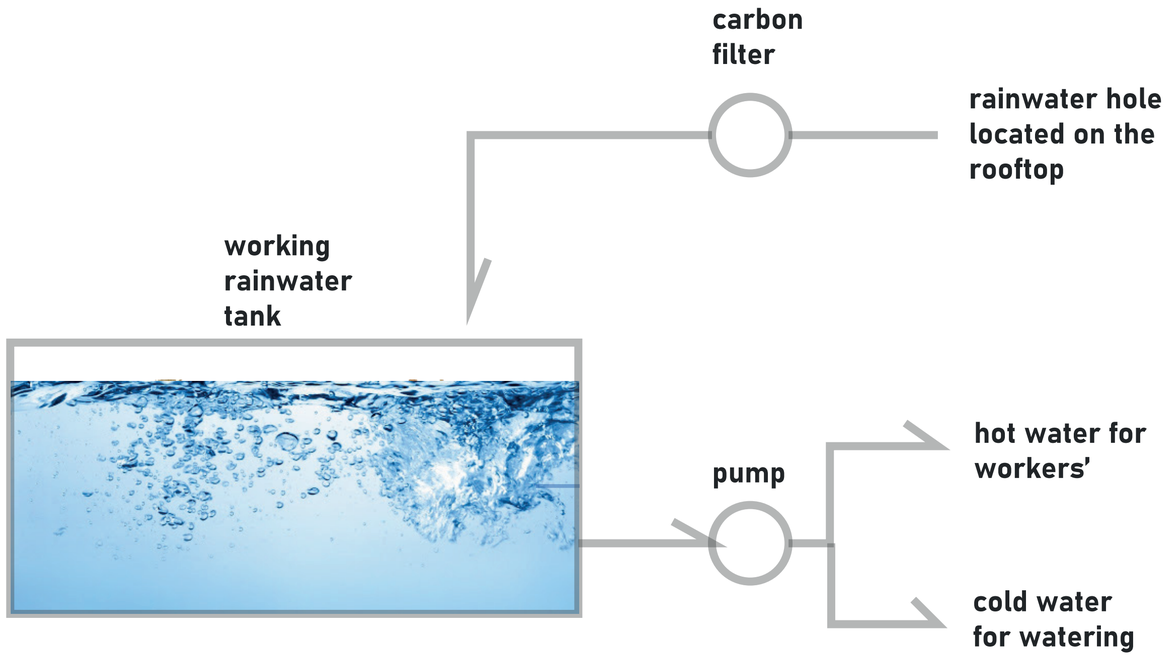
Vacant buildings sections



Brzeska

Aquaponic water system

how water is collected from rain and works in aquaponic



- water tanks located on the last floor derive the water from the rain
- water through aquaponic system is deployed for the whole building with suitable amount for every kind of plants
- watertank contains pumps which allows the water to work faster
- before using rainwater is purified from the impurities by simple system as carbon filters or strainers
- to make the building as much self sufficient as possible, rainwater can be used also in toilet or kitchen for people working on plants sale and aquaponic system support

Details

Aquaponic water corculation step within the building

1. Waste water from fish tank is pumped up and and collected in water tank

2. Waste water collected in the water tank is periodically flushes into the plants, where they can use nutrients in the water

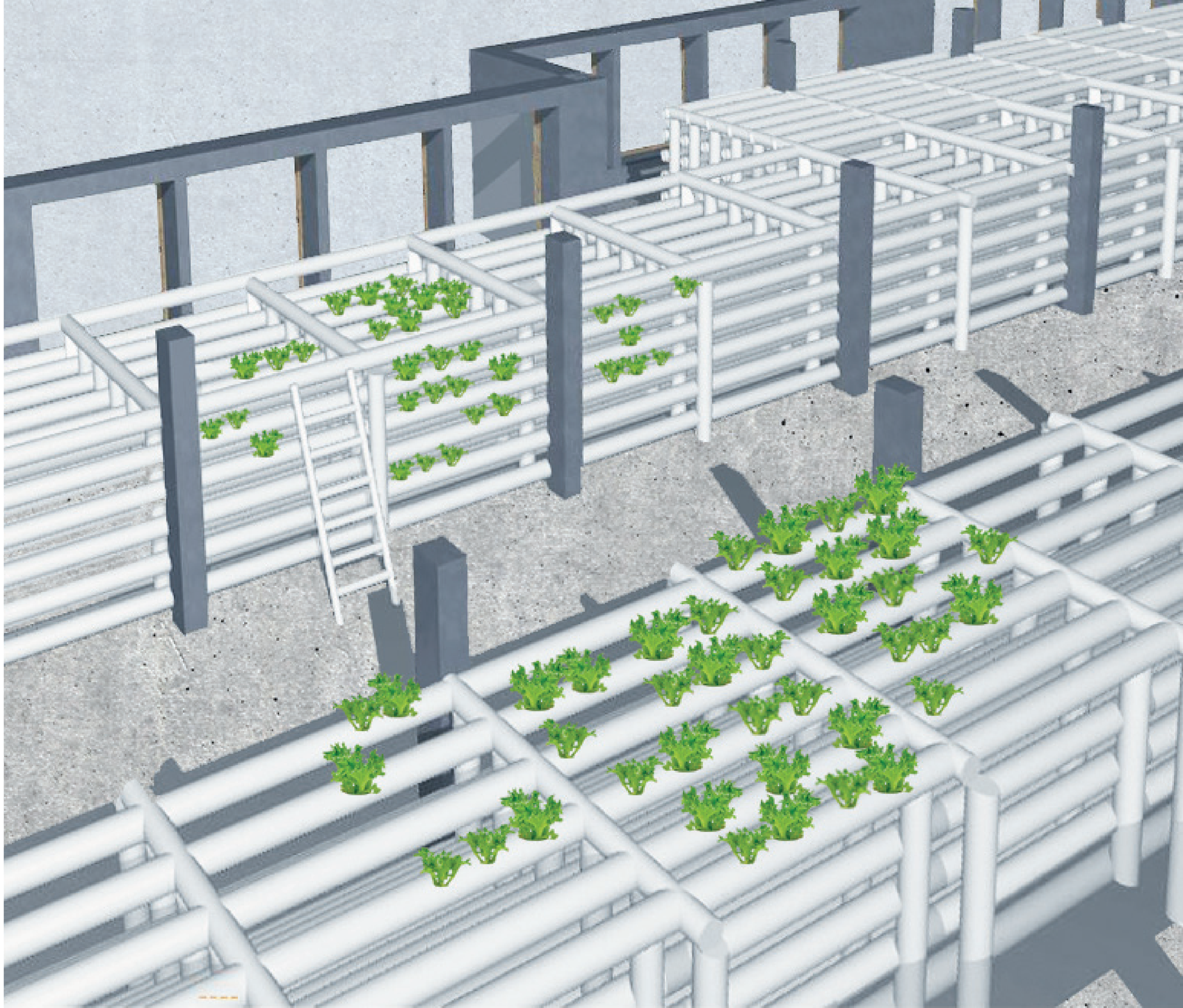
3. Cleaned, aerated water flows from the plants to the fish tank

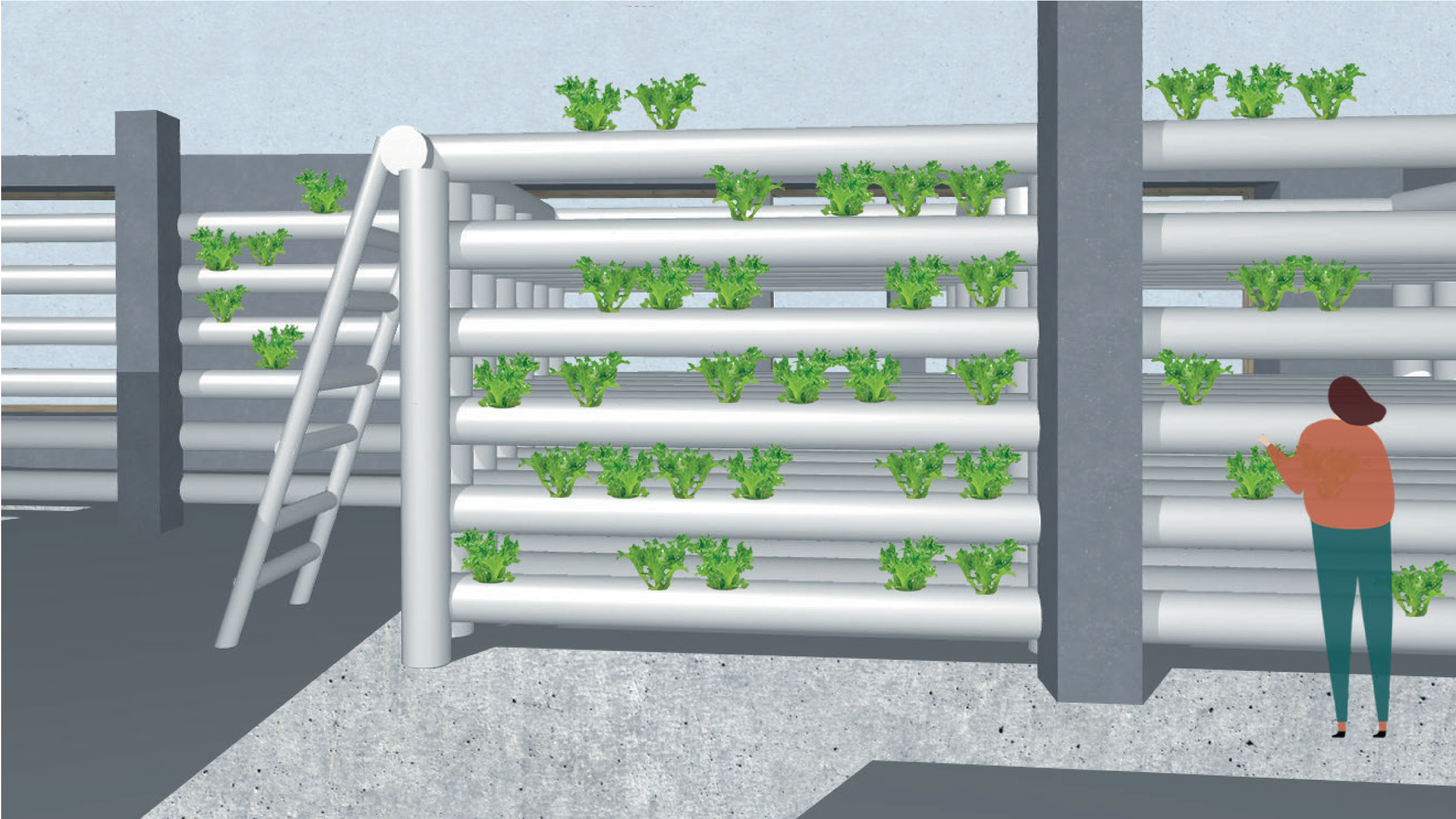
4. Water and fish waste are pumped from fish tank back up into the top tank to repeat the cycle again

crops plant in vertical or horizontal PVC tubes, where the water circulates, which allows to save 90% of the water

Facade

Perspective View





Thank You!