Kleine Welten IV, Vasily Kandinsky

INclusive **OUT**door

EXpanding our increasingly little world

Creating outdoor ‘spaces’ that attract will help us to expand our world. Expanding our world will create a more diverse, dynamic and robust society that is prepared for the challenges of the future.

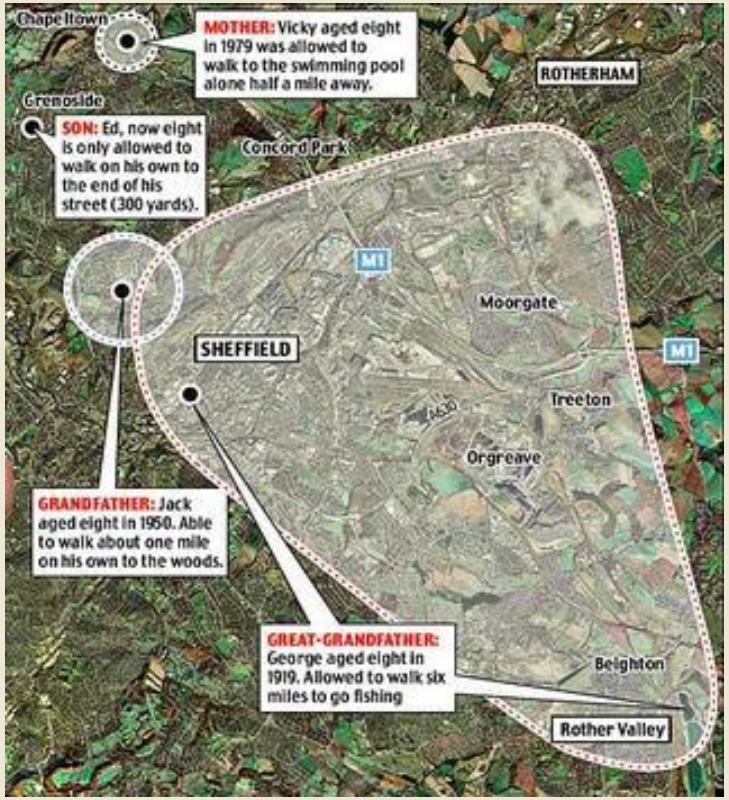
Modernity has led us to withdraw ourselves from our natural environment. An environment that used to be our habitat, the outdoors where we interact with nature, weather and possibly encounter unexpected other humans and cultures.

Encountering the unexpected, the uncontrolled makes us as humans more robust and healthier both physically and mentally. It creates a more dynamic, open and social society.

How can we merge our traditional culture of hospitality and enjoying outdoor living with modern technology and a globalized, controlled society.

Our concept Immersive Environments approaches this from two sides. By creating more dynamic less enclosed indoor spaces and at the same time enhancing the outdoor environment. Creating attractive places where pleasant physical conditions offer possibility for cultural events. Where cultural events and social interaction become magnets for an active urban live.

This is about the INclusive OUTdoor that will seamless merge with the INside is the new OUTside.



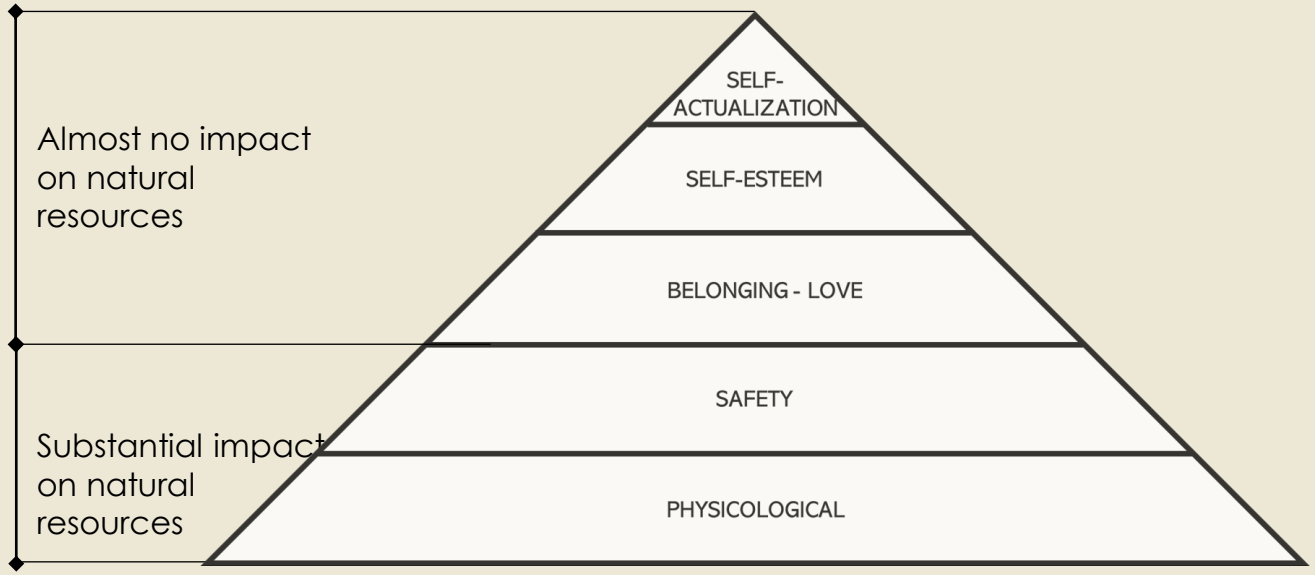
Transgressing the boundary

Rather then a discrete boundary between indoor (black spaces), closed space with clear boundaries, and outdoor (white spaces) open unbounded large-scale space Kisho Kurokawa proposed grey-spaces; incompletely closed, dynamic rather than definite space which cannot be defined clearly to be indoor or outdoor.

Kurokawa believed that especially these grey spaces responded better to the human desire for simultaneous satisfaction of multiple needs.

Maslow defines in his hierarchy of needs that we first want to secure possible deficiencies once secured our needs shift to mental and psychological growth.

In the late 20st century for a substantial part of the global population we would expect these ‘deficiencies’ to be solved. Yet we increasingly exclude our natural and social environment by living more than 95% of our time in a hyper controlled indoor environment.

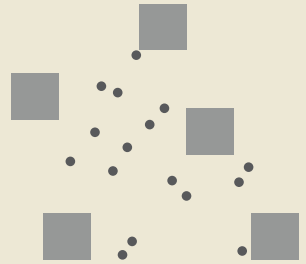


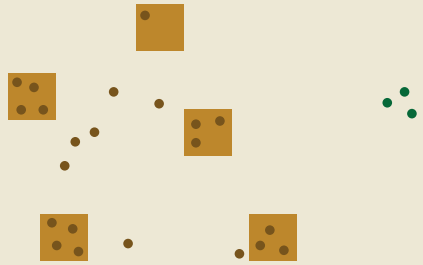
human creativity, social interaction belonging, recognition and love are all
infinitely available without any impact on the planet

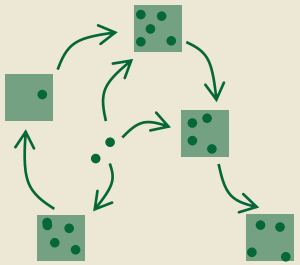
from the physiological needs fresh air and daylight also are limitless

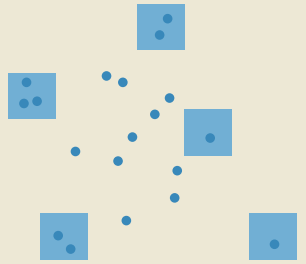
then why do we lock ourselves behind heavy façades away from other people, fresh air and abundant daylight?

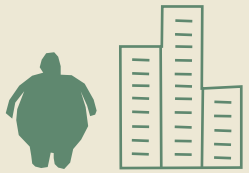
Timeline of our own defined boundaries

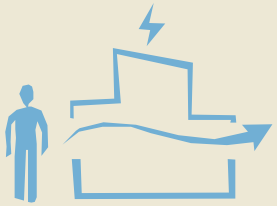












very past | **past** | **present** | **future**

Discrete boundaries, limiting our environment

Living mainly outdoors, buildings for protection, healthy people, social interaction.

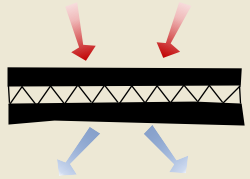
activities, interaction, experience, ourselves..

Combining nature, physics and high tech solutions

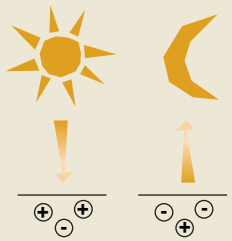
All systems are designed to operate autarchical at minimal maintenance effort by combining state of art simulation and evaluation technology, nature, physics and high tech solutions – **SMART** tech

Photovoltaics

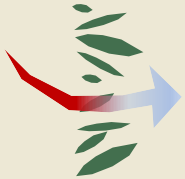
heatpump



peltier – thin layer static heatpump



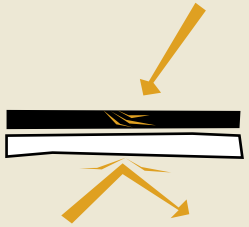
phase change materials acting like leaves



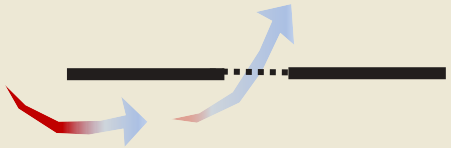
evaporative cooling

reuse from adjacent buildings

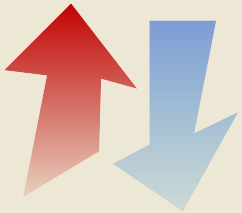
Undercooled waterdrop condensate



absorption and reflection



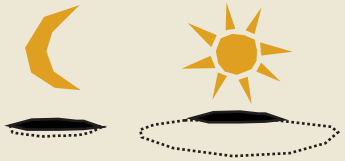
Soil equalizes seasonal average temperatures



Warm air rises
Cold air falls

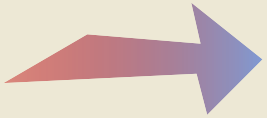
natural shadow

cooling by water



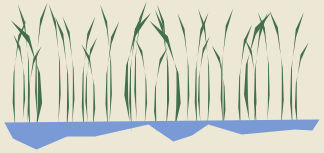
Hot air expands

Photosynthesis stores energy during the day releases it at night



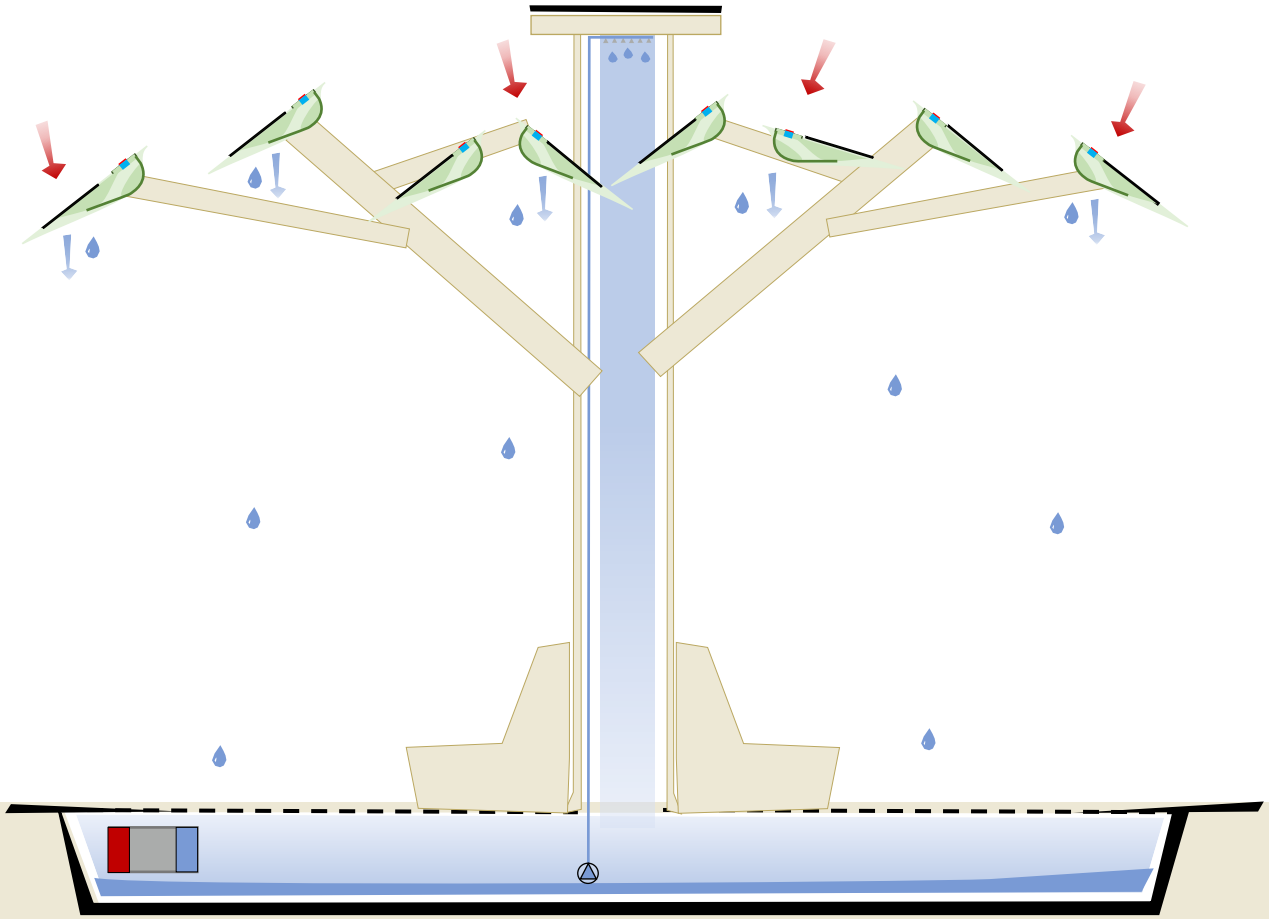
Moving air cools

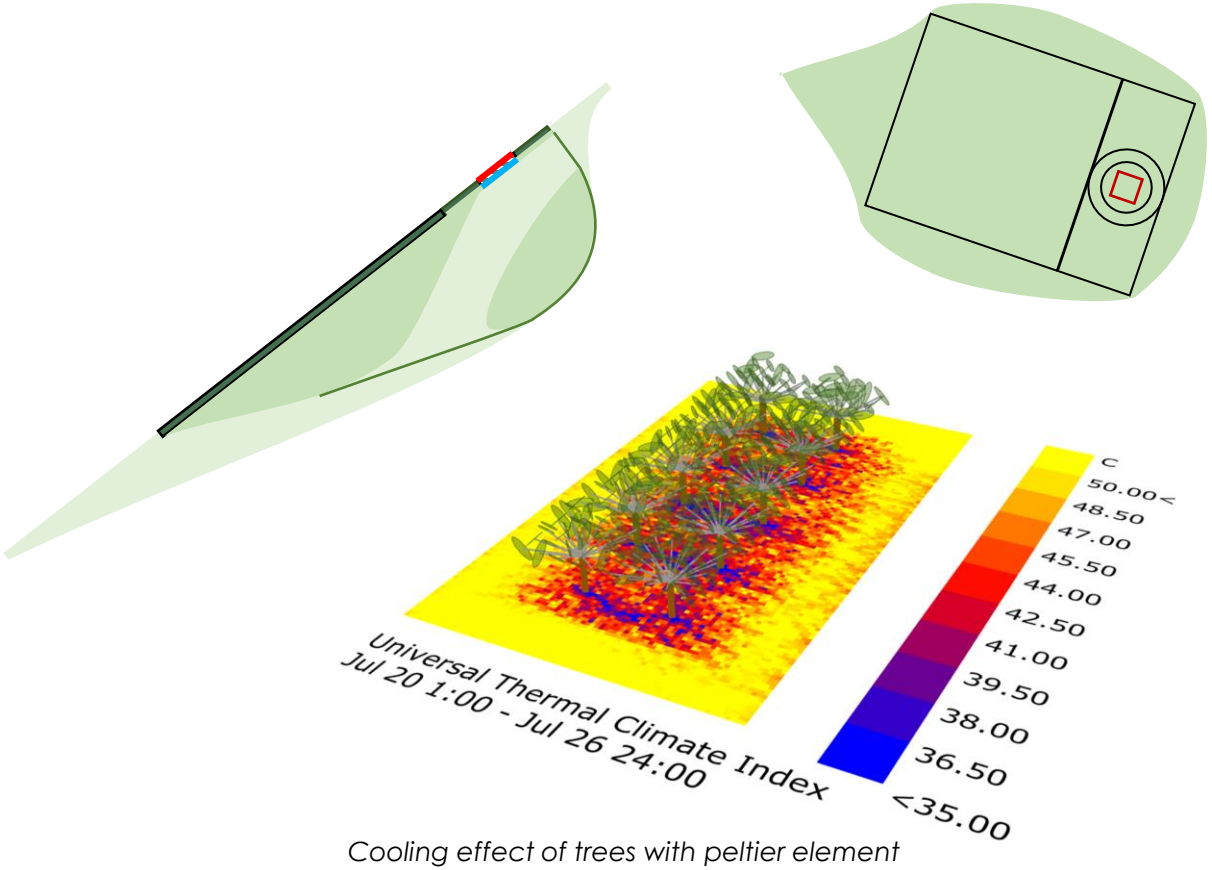
create and catch condensation



clean water by helofytenfilter

..into outdoor furniture





Cooling effect of trees with peltier element

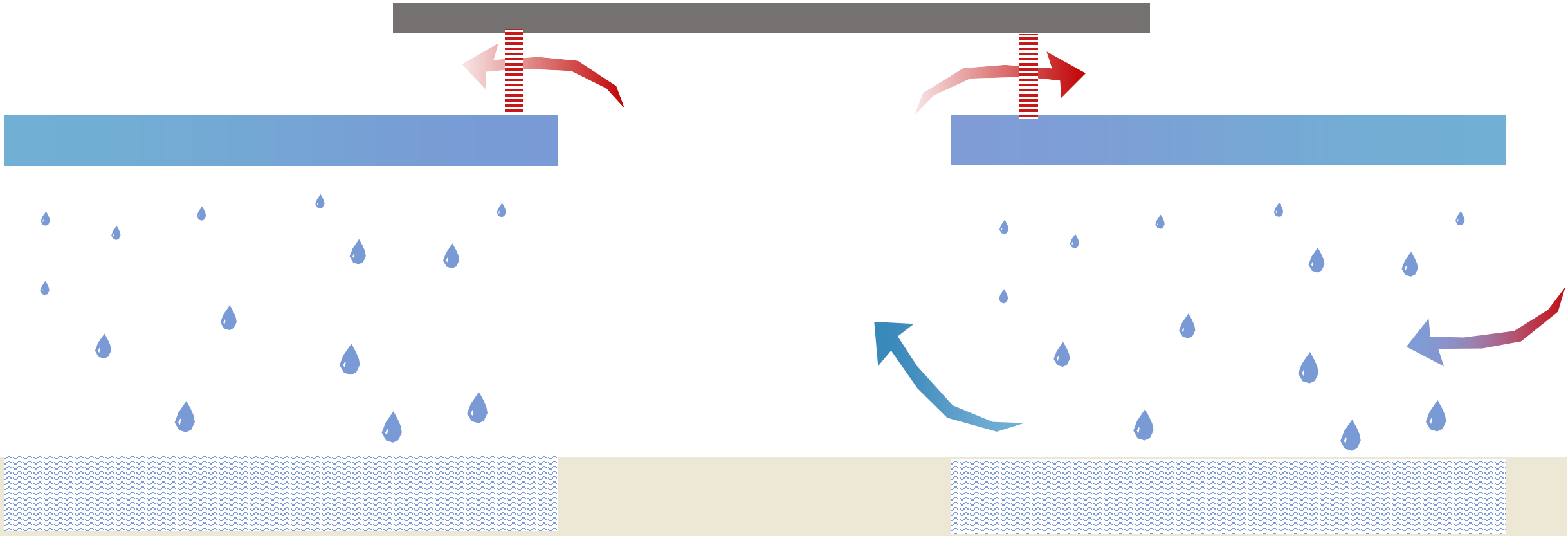
This artificial **AIR COndenser** makes use of smart technology to realize a comfortable climate below it's artificial leaves. The leaves positioned towards the sun, produce energy by **photovoltaics**. All other leaves contain **peltier elements**, which makes it possible to convert heat into cold. The sudden temperature difference leads to condensation, water drops down and creates a cooling effect for the direct environment.

Into outdoor furniture

The **sun flatable tree** consists of darkcolored material on top which absorbs the heat and reflective light material on the downside. The elastic material allows the shape to expand when heated by the sun. This creates **shadow** during the day.

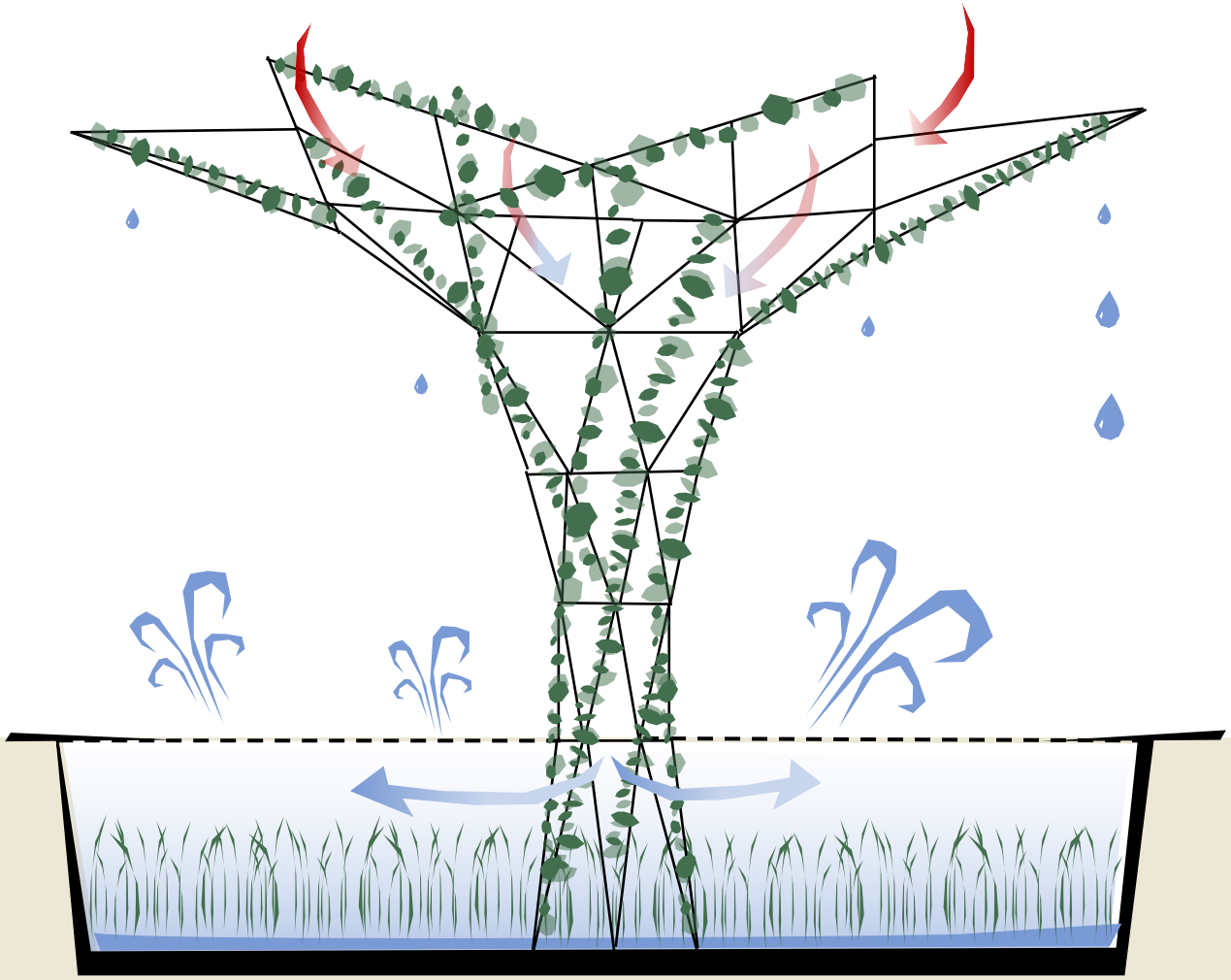
The **Cloud Pavilion** is the largest scale Urban Furniture, it is a small pavilion with terrace under an artificial cloud of aluminium wired mesh. The floor under the pavilion consists of Phase Change Materials, they harvest cooling at nigh releasing it during the day. Besides that PV driven cooling provides ‘rain’ drops and cool air during the day and the mesh cerates a damped atmosphere like a real cloud. The pavilion is fully autarkical.

Into outdoor furniture



The **rain roof** collects rain water during the whole season spaying it in the perimeter corners to create a naturally cool environment. The falling drops are cooled by PV driven chillers such that they don't evaporate but rather **condensate** moisture from the (dry) air. Thus evening hot summer it keeps collecting water.

Into outdoor furniture



This **low tech** tree combines techniques of all natural forces. Air is brought in the trunk, cooled down by water droplets and brought into the **water buffer** below. **Grey water** from adjacent buildings is purified in this buffer through **helofytenfilters**. Air from the trunk (climate cascade) is brought along the water buffer and cools down. Through open tiles the cooled air flows upwards. In this area a **natural breeze** can be experienced.

In urban context for diverse use