



Zone 2: Learning Hub / Community Theater, upper level

## MULTI-SCALAR SOLUTION

Each pod is movable and customizable with its kit of parts. The project includes a few variations, with and without the dew/ fog harvester and tall vs. short module. In small aggregates, they act as smaller communities and teaching gardens, as illustrated by double and triple modules on the project's upper level.

In its singular form, the pod can work with a backyard garden scale, supporting already robust Kleingarten practices. The Kleingarten is a plot of public land, usually around 400 square meters, maintained by a private individual or family. They can also be located adjacent to fields and forests on the city's peripheries and managed by local cooperative associations. There are 46,000 hectares of Keingarten (or Schrebergarten) land in Germany.

In greater aggregate, the scale moves towards a larger civic space that acts as the center of agricultural and social productions. The central core of each pod holds structural steel that can be connected to a concrete foundation to make a permanent structure on a larger scale, creating different zones for experimentation, crop growth, and social activities.



Zone 3: Play Area / Cooling Center, lower level

## INVESTING IN SOCIAL CAPITAL

Post-Terra is composed of the following three concentric zones of social production working across multiple scales: market/ agricultural center, learning hub/ community theater, and play zone/ cooling center. For example, the learning hub/ community theater zone hosts various activities, ranging from outdoor classroom learning at a small aggregate of pods to large events and lectures at the center amphitheater. Portions of the underside become back-of-the-house spaces for solar battery storage, water reservoirs, and general tools storage.

Three zones are connected at lower and upper levels connected by ramps. The larger structure takes on a more permanent form, made of recycled steel framing, woven steel cable, porous pavers, and reclaimed wood decking. The modular frame can be fabricated off-site and erected quickly on site. Recycled steel is a material that can be recycled multiple times without loss of quality and takes a nod to Mannheim's storied industrial past as it looks toward its future.

By concentrating crops using a hydroponic system, Post-Terra effectively utilizes large tracts of land to revert to its natural landscape and create social spaces. And the modular and self-contained nature of the pod means they can float beyond the established zones to continue pollinating, expanding, and creating additional zones.

## WATER AS A CRITICAL RESOURCE

Water is a critical resource for agriculture, and Post-Terra incorporates multiple approaches in collecting and conserving the water and using the water for a social co-benefit. For example, each pod is equipped with a dew and fog collector with a collection tray that funnels water flow down to the water reservoir at its base. And porous pavement areas on the upper-level help funnel water down to pods below where the water is collected.

### Cooling Stations

The project also recognizes Mannheim's hotter summers. Post-Terra's play zone / cooling center integrates a second layer of netting material draping below pipes with mist nozzles. A misting system works on the simple principle of evaporative cooling. Water uses energy (heat) when evaporating from a liquid to gas, leaving the area around it cooler. A high-pressure system can cool outdoor temperatures up to 30 degrees. It is a scalable system that can help people and plants cope with scorching hot weather.

### Dew Harvesting

Dew accumulates above 75% relative humidity, and Mannheim's high relative humidity (9 months out of the year) creates favorable conditions for dew collection. Dew water harvesting based on radiative cooling techniques is derived from mimicking dew formation on plant surfaces, which occurs due to the passive surface cooling of plants overnight. The condensers are grooved panels made of high-emissivity film insulated underneath. As the droplets get cooled by re-radiation at night, rainwater can be harvested using the same surface.

### Fog Harvesting

Rhine and Neckar rivers join at Mannheim, creating a favorable condition for fogs forming near the waterways and river valleys as the water increases the humidity in the air. As a result, fog is typically thicker in these low-lying areas as the heavy airflow downward, and fog harvesting provides an alternate source of freshwater by capturing water from wind-driven fog. The suspended mesh structure traps water droplets as the fog is driven through the structure and resulting drops of freshwater drip into a collection apparatus leading into a storage tank. Double layer mesh net can be made of nylon, polyethylene, or polypropylene.

The project supports the following United Nations Sustainable Development Goals:

- Goal 2. End Hunger, achieve food security and improved nutrition, and promote sustainable agriculture.**
- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.**
- Goal 6. Ensure availability and sustainable management of water.**
- Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all.**
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.**



Zone 3: Play Area / Cooling Center, lower level

