



## PURIFYING CLOUD

To address various problems caused by sea level rise, we propose a building "PURIFYING CLOUD" that harvests fresh water.

Harvested water will be used for human activity or filtered, and eventually returned to the ground to be stored in aquifers.

The storage and infiltration of fresh water not only prevents aquifer depletion, but also mitigates the loss of agricultural land due to salt damage.

2022 JACQUES ROUGERIE FOUNDATION AWARDS

Award's category : Architecture and Innovation related to Sea level rise - Focus Award : Submersions, erosion

Project's Name

PURIFYING CLOUD

Description

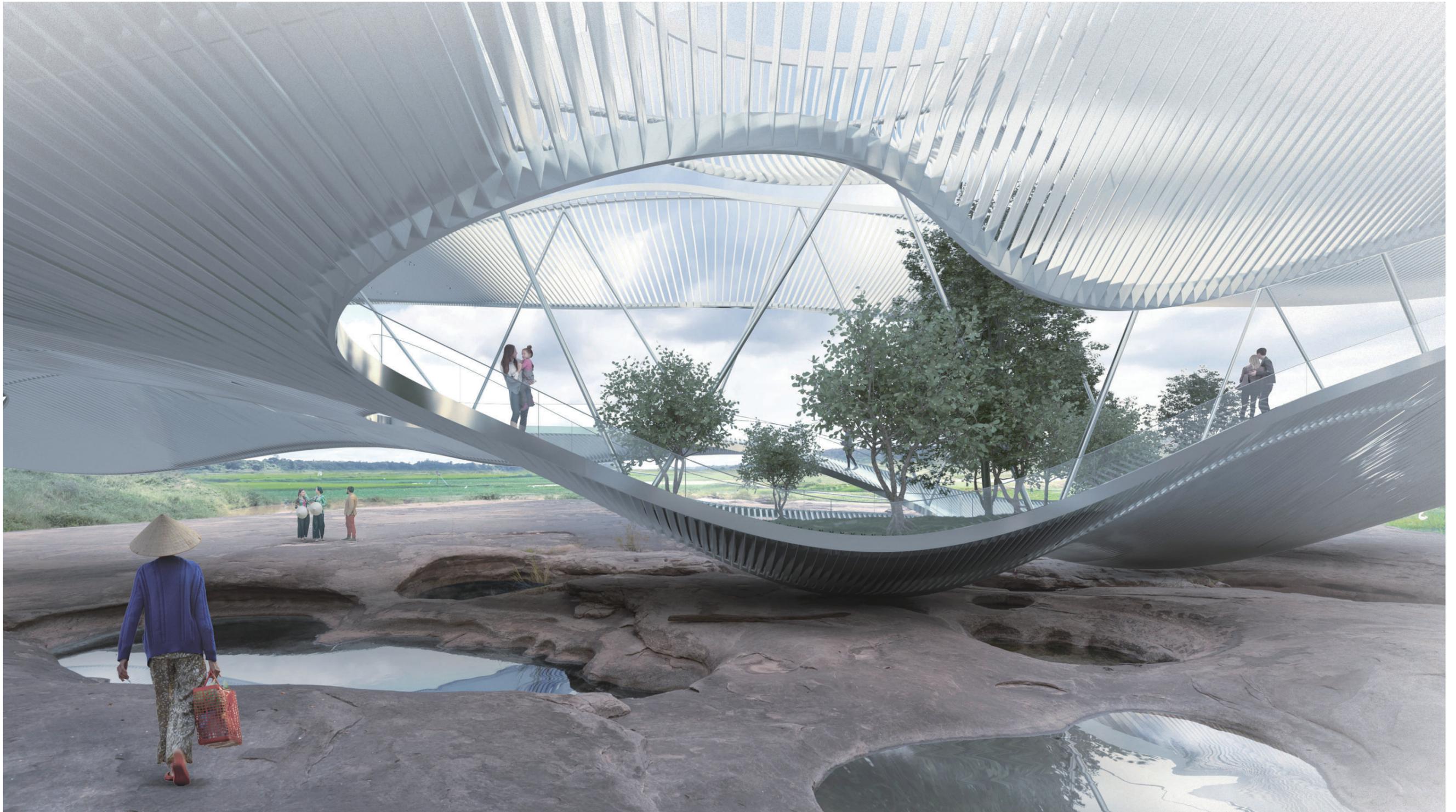
Salt Removing Architecture



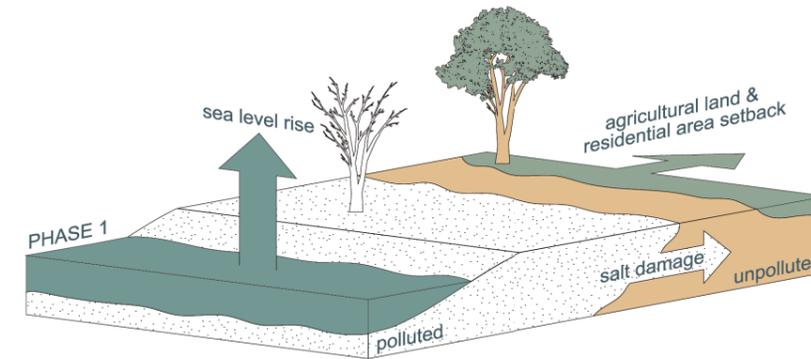
PURIFYING CLOUD floats along brackish water. Our proposal is applicable anywhere in the world where salt damage is in progress.



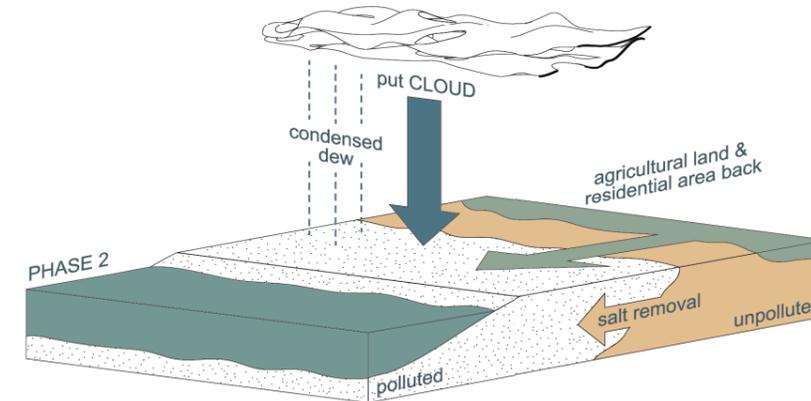
Undulations of CLOUD create a variety of places.



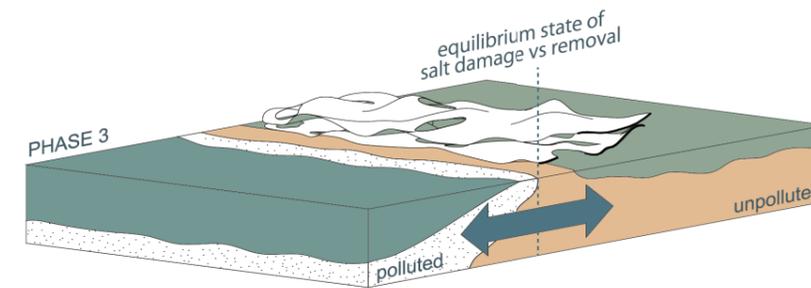
Salt damaged lands are being cleaned up gradually.



**PHASE 1 : Present Condition**  
Rising sea level causes progressive salt damage.



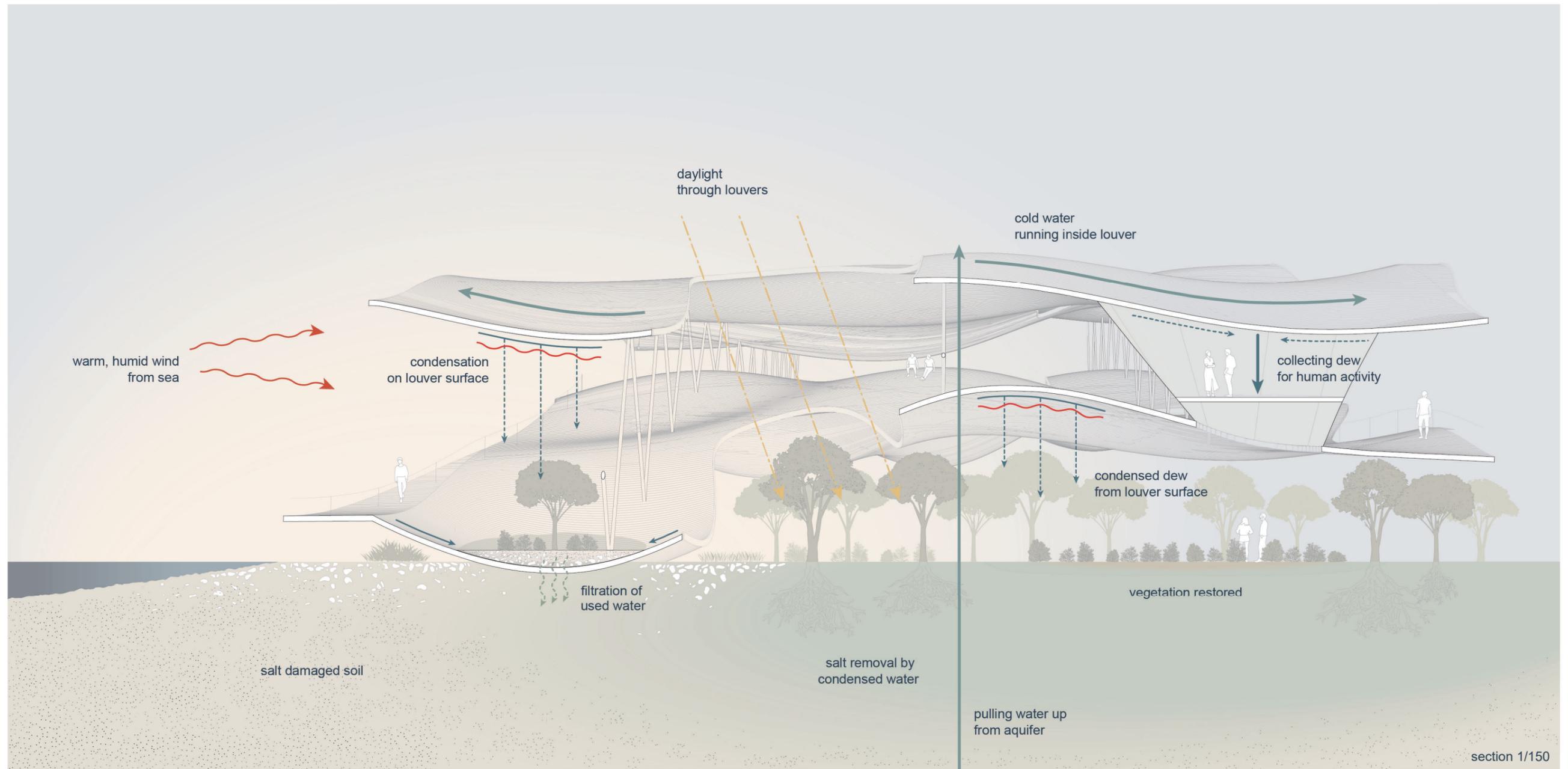
**PHASE 2 : Proposal**  
PURIFYING CLOUD resists chronic salt damage by generation of water and permeation.



**PHASE 3 : Future**  
Maintain farmland and secure living areas in the event of flooding.

## SALT REMOVING ARCHITECTURE - Architecture as a Cloud

Sea level rise are causing salt damage to soil all over the world. In brackish water area, agricultural land and residential area are being set back due to salt damage. We propose PURIFYING CLOUD to inhibit chronic salt damage by generating fresh water. As rain clouds bring various blessings to our lives, PURIFYING CLOUD maintains agricultural land and residential area by condensing dew. In the event of flooding or sea level rise progresses, PURIFYING CLOUD provides living area.



## RAIN GENERATOR SURFACE

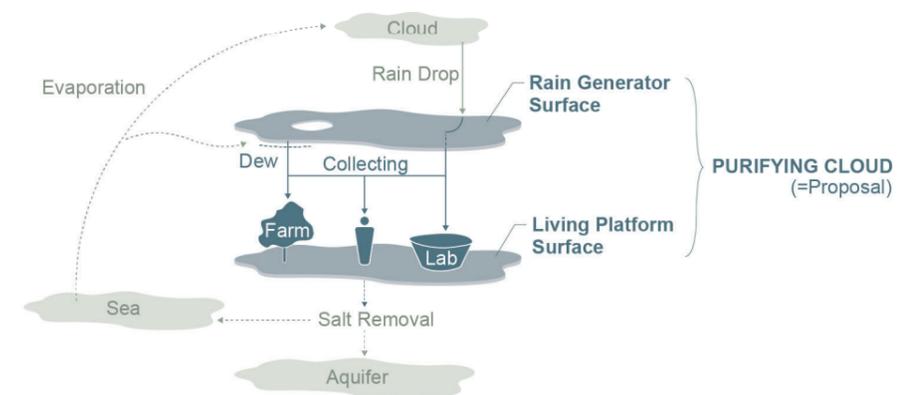
### Generation of fresh water through groundwater circulation

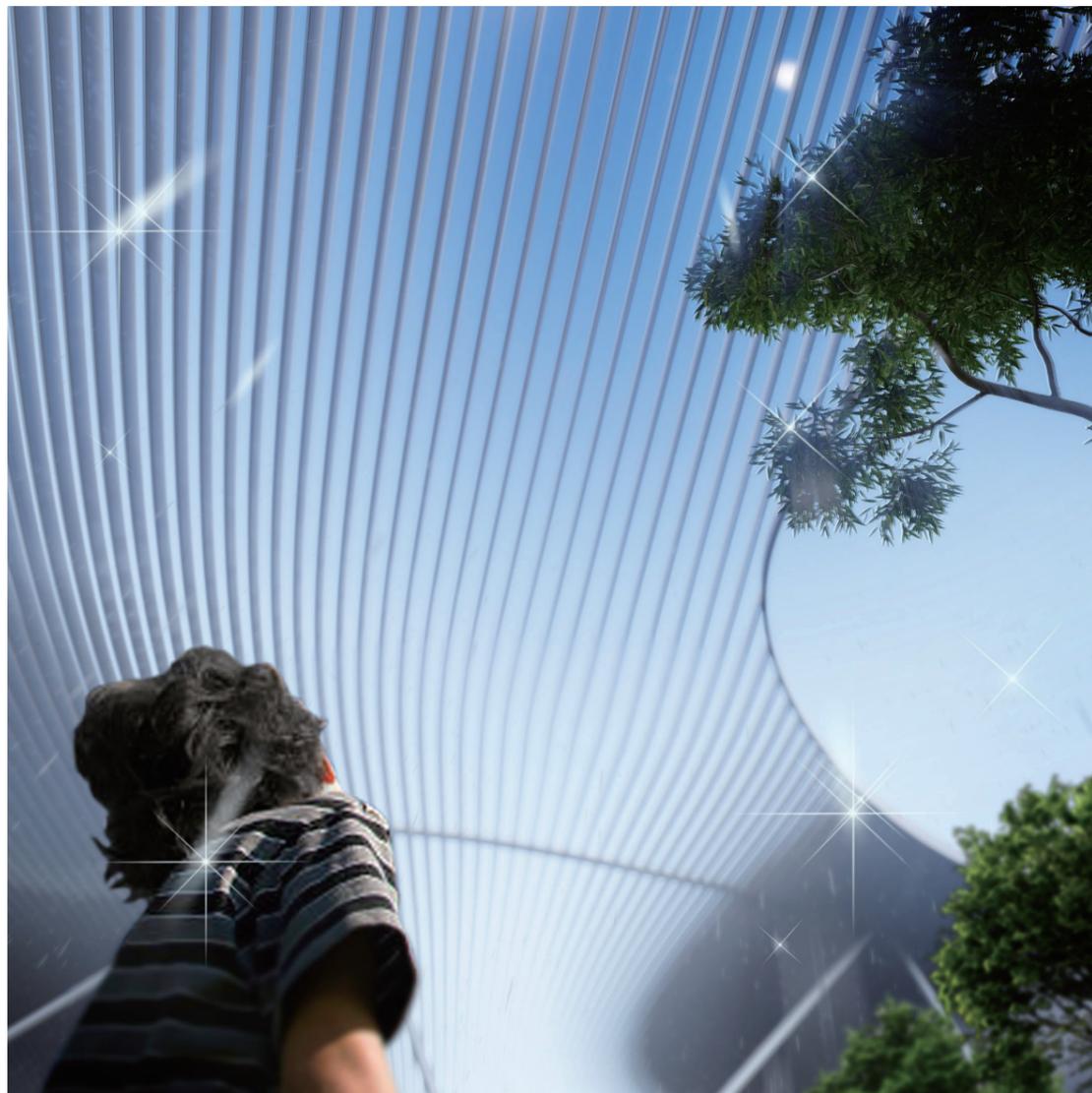
This architecture consists of two floating surfaces. These surfaces are rain generators that generate fresh water through condensation caused by the temperature difference between its skin and atmosphere.

Gently ripple shape of the rain generator gains greater surface area, and more fresh water can be generated.

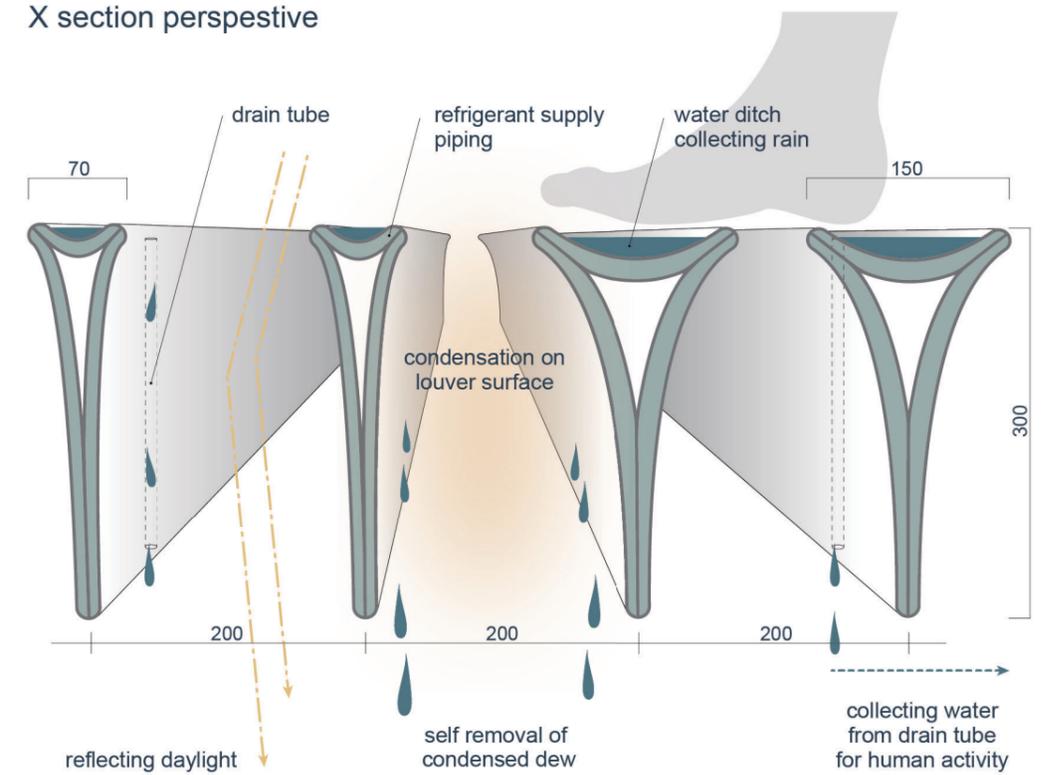
The fresh water generated moves along undulations of the surface, circulates through the building, and then returns to the ground.

The surfaces are tautly connected with wires to form trusses, which partially contact the ground to transfer loads to the ground.





X section perspective



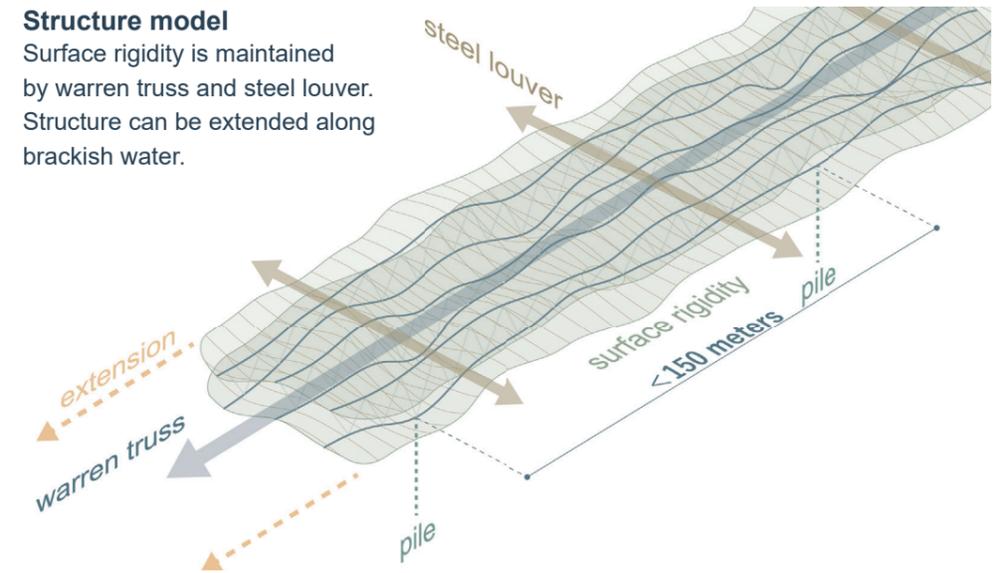
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## RAIN GENERATOR SURFACE

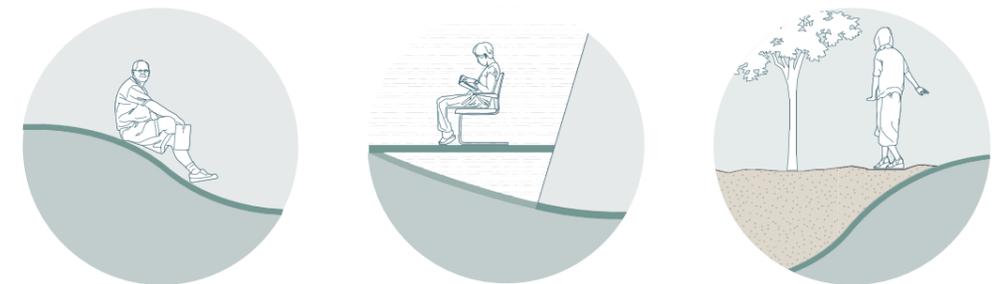
### Detail

This architecture is covered with metal louvers through which refrigerant circulates. The refrigerant is cold groundwater pumped from the aquifer by tubes that also serve as building piles. After circulating inside louvers, the refrigerant returns to the aquifer. The temperature difference between the louver skin cooled by the refrigerant and atmosphere causes condensation on the surfaces of the louvers.

By increasing surface area per cross sectional shape, condensation is efficiently induced.



**Undulations and Activity (example)**



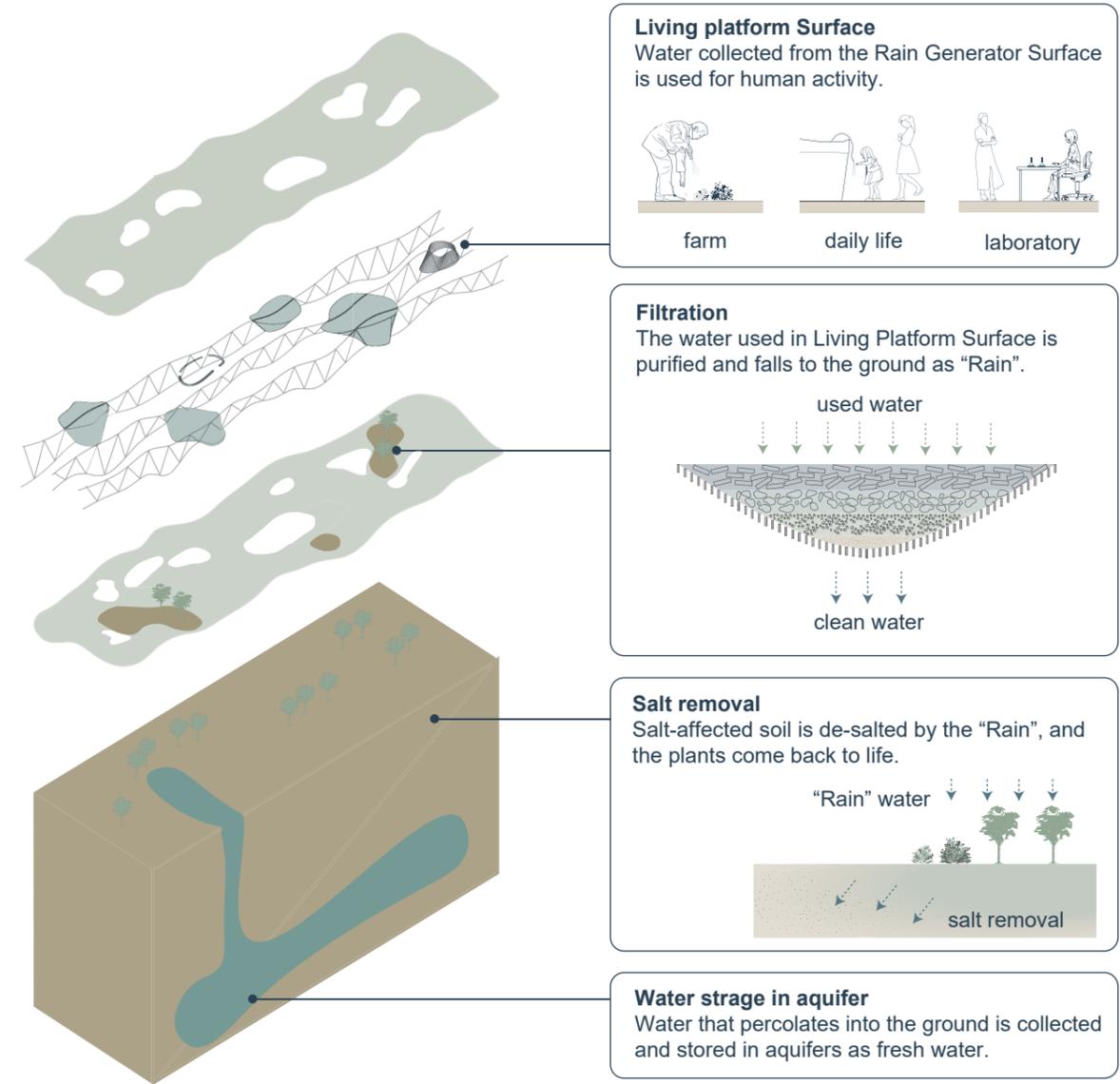
**SWELL : Furniture**

**PEEL BACK : Flat Floor**

**DENT : Soil**

**WAVY LANDSCAPE**

Waved surfaces create rich undulations. Utilizing various properties of the wavy surfaces, it induces various human activities. Structure consists of warren trusses parallel to the river and louvers that bear the horizontal loads in the perpendicular direction.

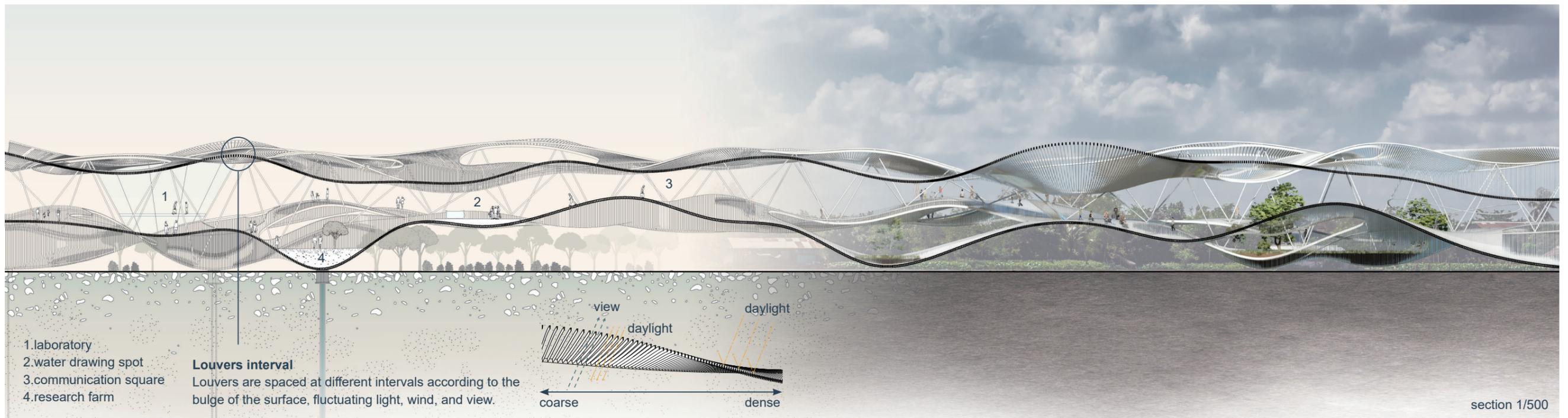
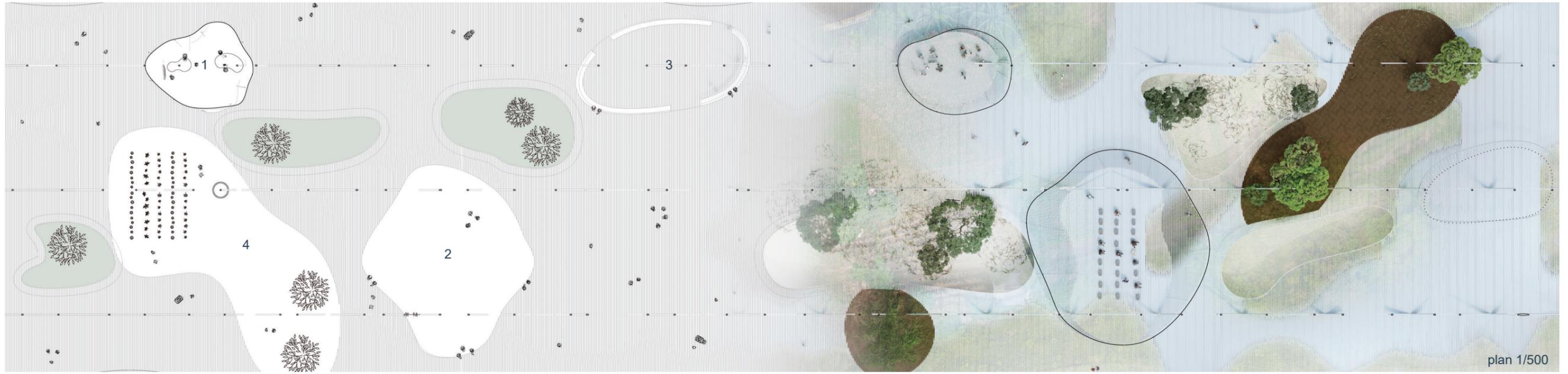


### FLOW of GENERATED WATER

The fresh water generated by the condensation runs over the surface of the louvers and creates various scenes inside the architecture. The water is used for daily lives of local residents, for watering plants, for research activities, etc.

The used water passes through a filtration layer and falls to the ground as "Rain".

The "Rain" percolates into the ground, moistens the farmland, washes away salts in the ground, and is then stored in the aquifer.



## PLAN & SECTION

PURIFYING CLOUD functions as a research center to conduct research on sea level rise, and a community center to serve as a hub of activity for local residents. It enriches the future of mankind and the lives of local residents. In order to maintain the terrestrial ecosystem, it is grounded minimally and floating (above brackish water). Its undulating cross-sectional shape creates spaces with various air volumes, and thus a variety of places to stay. Trees and soils are encroaching into the interior of the architecture. PURIFYING CLOUD becomes a new landscape.