
Farming the Flood

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The current emerging global issues are evolved from the abrupt increase in population and decrease in available resources. This scarcity of materials and increase in demand for architecture urges architects to create new types of architectural materials and construction methods. Farming the Flood is a project that attempts to solve these issues.

Sand is one of the most abundant materials on Earth, it has amazing properties which are heavily dependent on the method of stabilization. It can be found in the fragile form of glass or as strong as sandstone. Historically sandstone has proven itself as a permanently strong material however it is difficult to extract, manipulate and transport. *Bacillus pasteurii* has the property of using the flexibility of sand and producing the strength of sandstone. This bacterium has the property of producing calcite which binds the sand grains together and results in sandstone.

One of the issues related to the increase in population is urbanization. Cities are currently overflowed by people who are leaving their farms behind to attempt a life in the city. Farming the Flood is driven by this social factor. The project uses the farmers' agricultural expertise in order to create a new type of architecture. The construction process is revolved around the routine tasks common in agriculture such as irrigation and hoeing. With these two techniques and the proposed mixture of sand and bacteria a new construction method is formed. The farmers are required to set up an irrigation system followed by a

systematic weekly addition of layers of sand. This method is similar to 3D printing and allows for the architecture to grow vertically without the need of any formwork.

The current proposal's site was chosen based on the country's expertise in agriculture and increase in urbanization. Asuncion, the capital of Paraguay is currently under a heavy process of urbanization that results in an increased favela population. Farming the Flood is placed in one those favela's in Asuncion which undergoes regular flooding damaging the life's of these new urban inhabitants. The project incorporates itself in the already existing favela phenomenon of destruction and reconstruction with long term goals to eliminate the fragility aspect of the favela life while keeping its identity as an expressive urban organism.

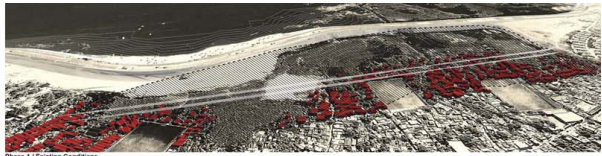
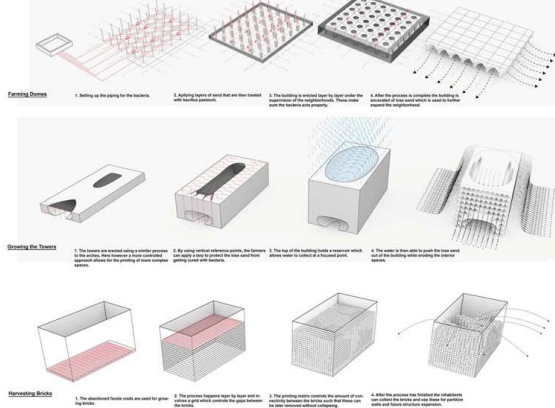


FARMING THE FLOOD

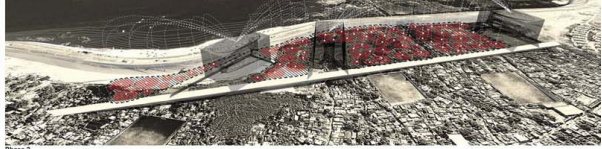
Using the agricultural expertise in Paraguay to build a new type of architecture with bacteria and sand.

Because of its abundance and properties to change form and state, sand was picked as a matter for study. *Bacillus Pasturei* was selected as a method for stabilizing the sand. The bacteria produces calcite which binds the silica in the sand grains producing sandstone. The location for the project is a favela in Asunción, Paraguay a neighborhood populated by farmers moving into the city because of the global issue of urbanization.

The architectural proposal sets a goal of incorporating housing construction in the existing cycle of destruction and reconstruction with long term goals to eliminate the fragility aspect of the regular favela life whilst keeping its identity as an expressive urban organism.



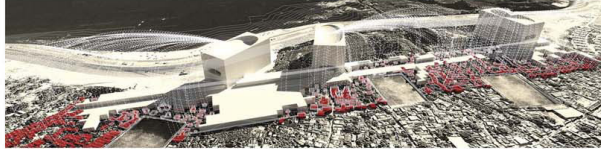
Phase 1 Existing Conditions
The current favela neighborhood is constantly flooded because of its low topographical level. The construction of a wall with the bacteria will control the flood and will be used as a road.



Phase 2
Harvesting the sand brought in by the flood to start building up the towers using a layered bacteria printing method.



Phase 3
After the completion of the towers the loose sand will be removed and used to build up supporting program on the ground level.



Phase 4
Removing the loose sand from the ground program and using that to completely cover the previous favela. This will create a level platform that reflects the memory of the past urban identity.



Aerial View of the New Community
The new megastructure provides enough housing for the existing favela and for potential new residents while offering a East-West connection between a new developing area and an old neighborhood.

