



MANGROVEhousing

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The mangrove forests of the Saloum River Estuary in Senegal are deteriorating as a result of rising sea levels, saltwater intrusion, a decline in rainfall and the overexploitation of mangroves for lumber and charcoal. The Mangrovehousing design aims to heal this mangrove "wound" by creating a community in which people live and work while regenerating the mangrove barrier.

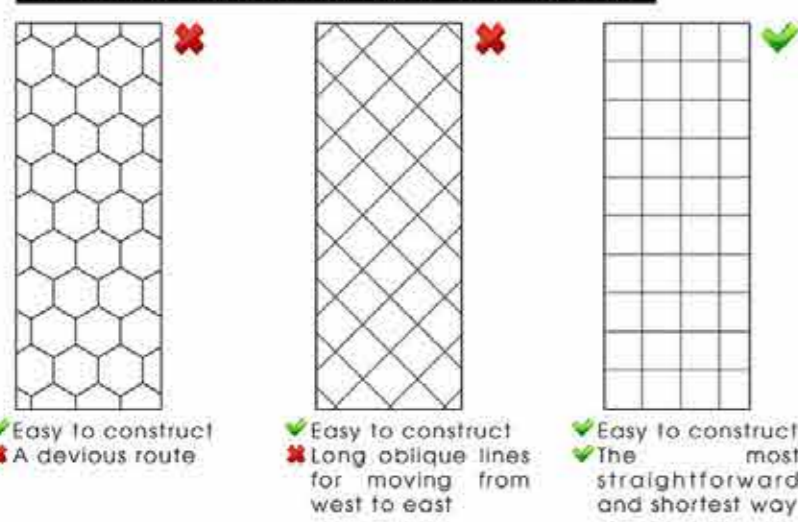
In the first stage of construction, local people collect inland soil and wood from dead mangrove forests and replant the forests. As the mangroves grow into a forest, sediment is collected in their soil and the coastal land area increases. The old dome structures are reused for planting new mangrove clusters and for building mangrove houses for families. The development process is repeated until the areas are connected and public buildings can be constructed.

Built with the timber from dead and newly regrown mangrove forests, the structures are prefabricated and assembled by the local community. The dome protects the house against strong winds, while slats reduce sunlight. The roots of surrounding mangroves and the pile footings of the house protect each other from strong currents. Cooking with biogas instead of charcoal significantly reduces carbon dioxide emissions and deters further harvesting of wood for charcoal.



Saloum river, Senegal

Comparison between typical circulation grids



Easy to construct
A devious route

Easy to construct
Long oblique lines for moving from west to east

Easy to construct
The most straightforward and shortest way



Djiffer village - old grid
Mangrove housing - new grid



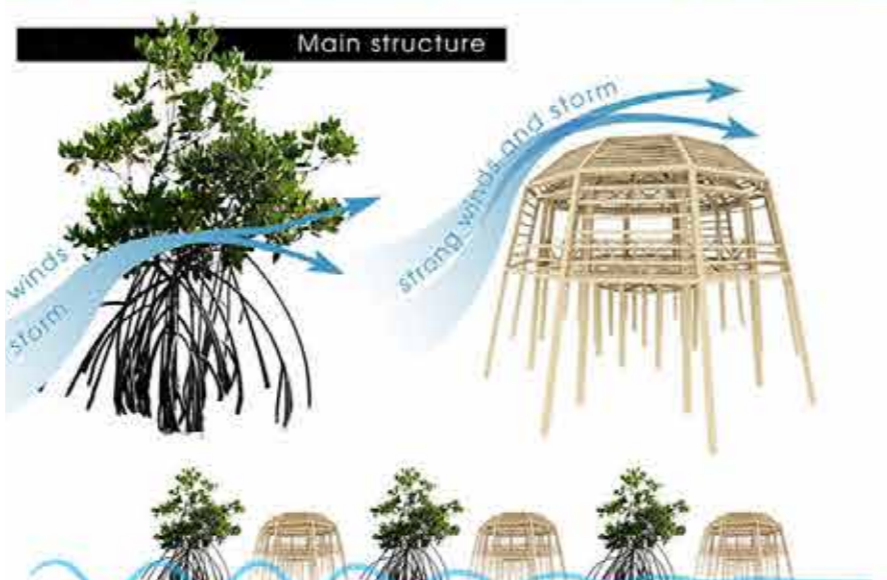
In the first stage, local people collect soil from inland and wood from dead mangrove forests, then replant new mangrove forests inside the mangrovehouses. The dome structure and its louvers are used to reduce intense sunlight.



In the second stage, the first generation of mangroves grows up, forming two completed mangrove forests, while their soil accretes sediment to the coastline, increasing land area. The old dome structures are reused for planting new mangrove clusters and building mangrovehouses for families.



In the third stage, the development repeats until the two areas are connected, followed by the replication of necessary public houses including woodworking shops, markets, community houses, schools, chapels, restaurants, with different sizes. Subsequently, a strong barrier is created by involving local community in building process, planning, implementation and monitoring the mangrove ecological system.

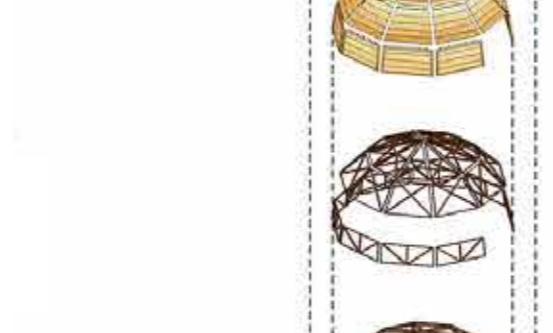


Main structure

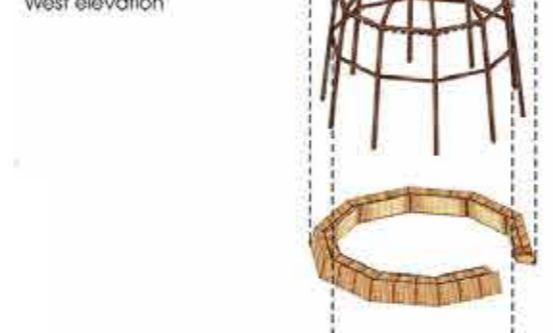
Floor plan
Total areas: 47m²



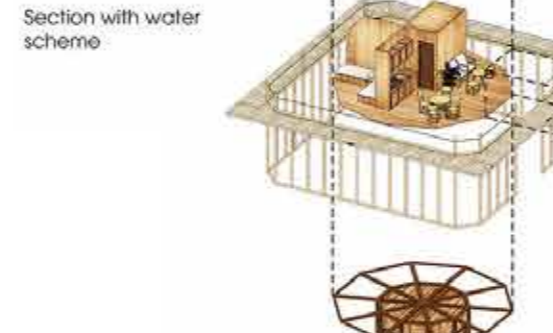
North elevation



West elevation



Section with water scheme



- 1 Louvers for shade, reduce intense solar radiation
- 2 Outer wood frame
- 3 Exterior wood shutter panels
- 4 Shutter windows
- 5 Wood cross brace
- 6 Inner wood frame
- 7 Rain water collector, filtration and storage
- 8 Furniture
- 9 Foundation structure
- 10 Biogas system



The dome structure is inspired by the mangrove root system and protects the house against strong winds, while slats reduce sunlight. The trunks of surrounding mangroves and the pile footings of the mangrove houses protect each other from storm surges and weaken strong water currents.

The windows on each house can be opened for ventilation and to bring the forest ambience inside. Cooking with biogas instead of charcoal significantly reduces carbon dioxide emissions and deters further harvesting of wood for charcoal.