Blue Garden

is a functional permaculture garden located in intertidal zones that exhibits the potential of seaweeds. The intervention is imagined to be an interactive botanic garden, where certain species are put on display. Unlike a botanic garden, however, the species are not brought from elsewhere, their growth is facilitated and encouraged through formal, material, and environmentally informed interventions. The material seeks to close waste loops by utilizing waste from the seashell industry, Through a system of tide pools and terraces the garden seeks to promote the growth of seaweeds and facilitate human interaction with coastal ecologies, which are normally hidden underwater.

Material Development

this material is developed from waste seashells

shells are heated to produce calcium oxide (lime) and ground to serve as an aggregate replacement for sand making for a material almost entirely sourced from waste

Heat   Grind   Add Calcium Hydroxide
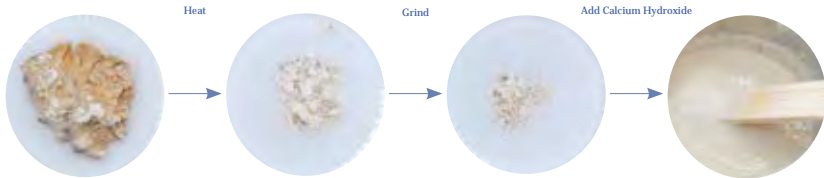
Shell waste collected from restaurants, markets etc

In 2007, molluscs production accounts for about 16 million tons and represents about 22 percent of the aquaculture industry's global production. An estimate of the availability of shell for use in aggregates indicates that there is potentially around 43,000t/year of shell waste that may be suitable for aggregate applications.

Fabrication Method

robotic extrusion of sand and binder

pouring of material + next layer of extrusion

tidal waves wash away the sand

Sea based additives reate different properties

Blended dried seaweed

Blended seaweed salad

Shrimp coat

Shrimp powder introduces yellowish colour and scent of the crustaneous to the material.

Instead of colour, seaweed provides texture and porosity - being washed by waves gradually.

Layering System

Formal Exploration

top down approach:

heightfields + differential growth +pouring language

existing slope

accessibility

pools

differential growth

Terraces

Time based design Structure that grows over the years.

13 hours between low tide and high tide.

shell material
geogrid

sand base

shell material layer

1:10 prototype

Resolution

Increases surface area and provides protection and bioreceptive surfaces for seaweed growth.

Bernacles
Interference Competition

Sea Slatter
Decomposing seaweed and feed on dead animal matter

Limpet
Mutualism
Limpet gets constant source of food while algae benefits from surface cleaning

Mussels mid and low-shore intertidal zone

Mitigates impact of ocean acidification

Green Algal Development Prevention

High Tides

Periwinkle

Gutweed

Low Tides
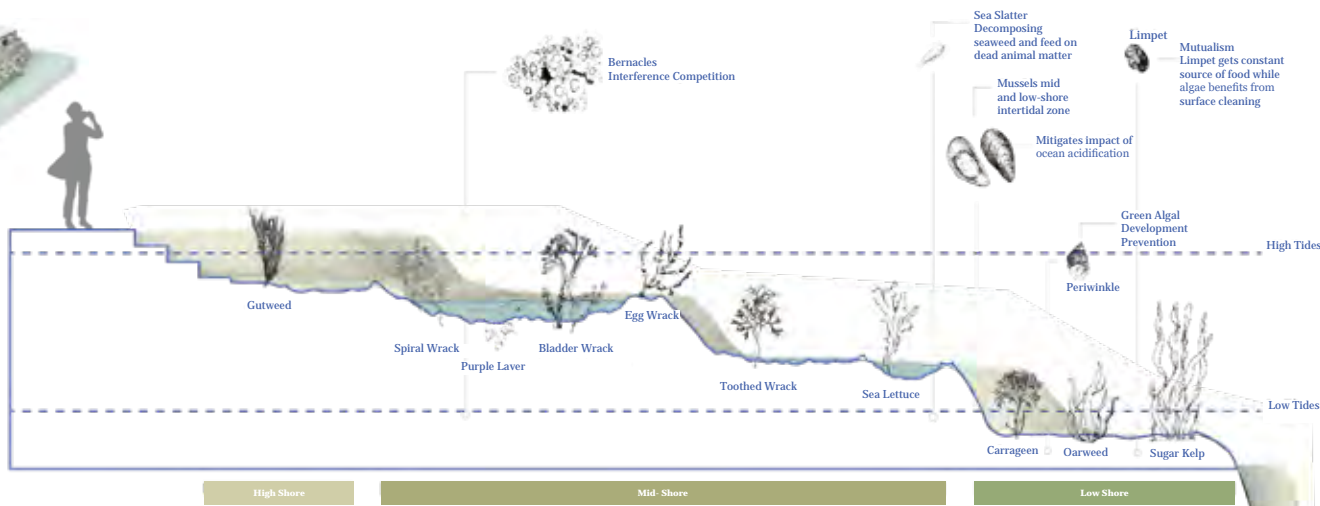
Spiral Wrack
Purple Laver
Bladder Wrack
Egg Wrack
Toothed Wrack
Sea Lettuce

Carrageen   Oarweed   Sugar Kelp

High Shore	Mid- Shore	Low Shore

Seaweed species found on site