

# HOUSING PRECEDENT: EMERGING GHANA



## BUILDING Structure

The primary structure of the building consists of rammed earth walls, which are reinforced with vertical steel members. Secondary structure consists of light wood framing members. Rubble trench foundations create a stable base for the structure. Connections in the structure remain dry and detachable in order to provide a flexible and reusable shelter.

## Scalability

A key principle of the open source house was that the design must be modular and flexible. This is achieved in the design by the ability to easily add or remove sections of the home. If the family grows larger the home is designed to easily accommodate another wing of sleeping or living spaces. Another key factor in the design is the ability to interchange pieces of home "A" with pieces of home "B".

## Sanitation

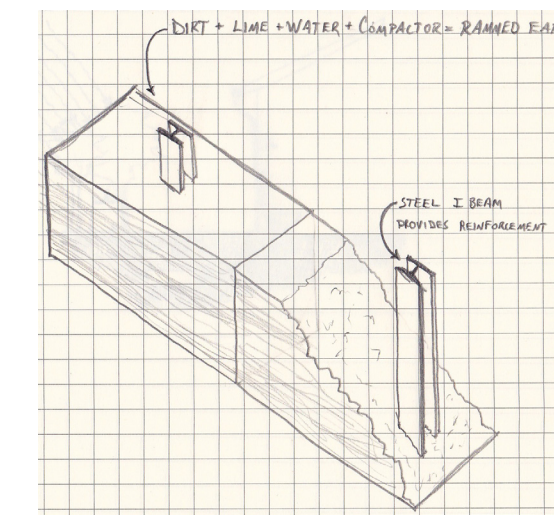
Indoor facilities include a shower, toilet, lavatory, and kitchen sink. Laundry is done outside at the "cool water deposit." The waste water is drained to the septic tank. This promotes composting and responsible waste management.

## Materiality

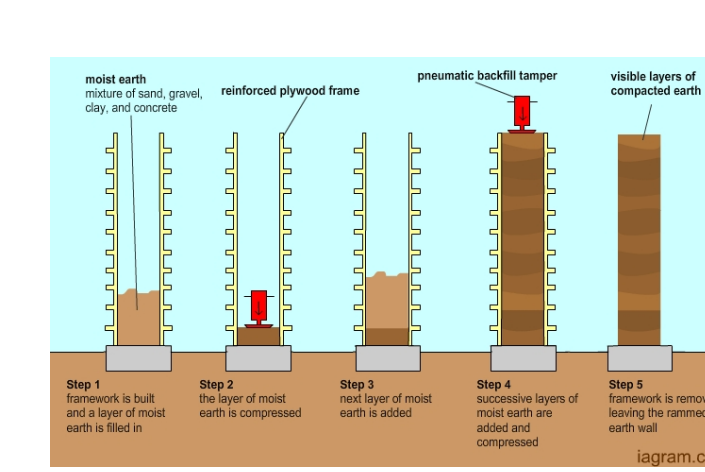
The materials used to build the house are locally harvested. The floors and roofing are made from strong Bahoma wood, the structural framework is made constructed with Bamboo, and the walls are made from compacted wood.



RAMMED-EARTH WALL ON SITE



RAMMED EARTH SECTION



RAMMED EARTH CONSTRUCTION



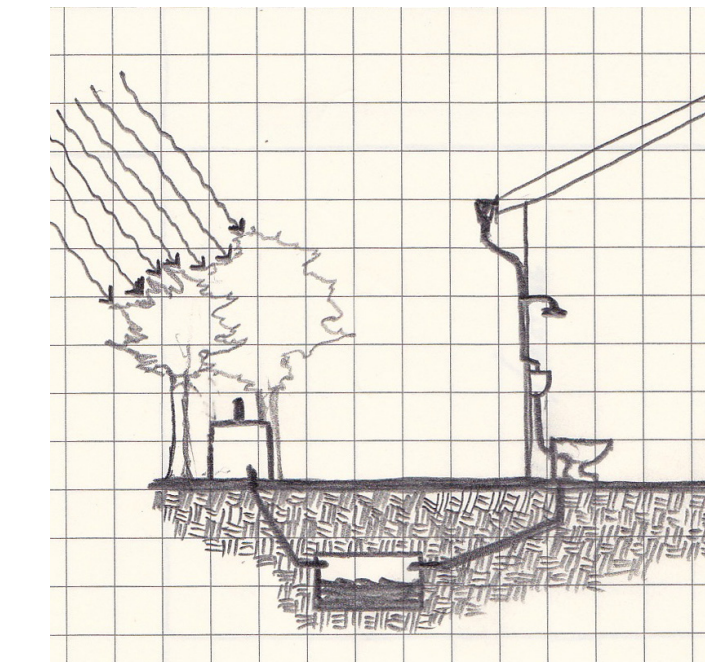
HAITIAN CONSTRUCTION



Many people in Ghana are not familiar with basic sanitation procedures. This image was a public service notice posted in a grade-school restroom. The indoor plumbing in the Emerging Ghana house will do a lot to alleviate this problem, helping people to keep clean and prevent common diseases.



BATHROOM IN EMERGING GHANA



WASTE WATER

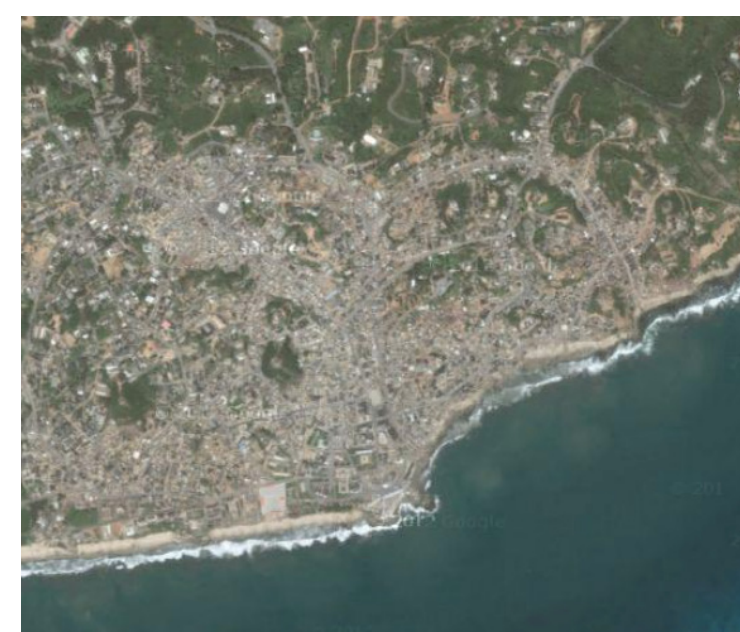


HAITIAN LAUNDRY

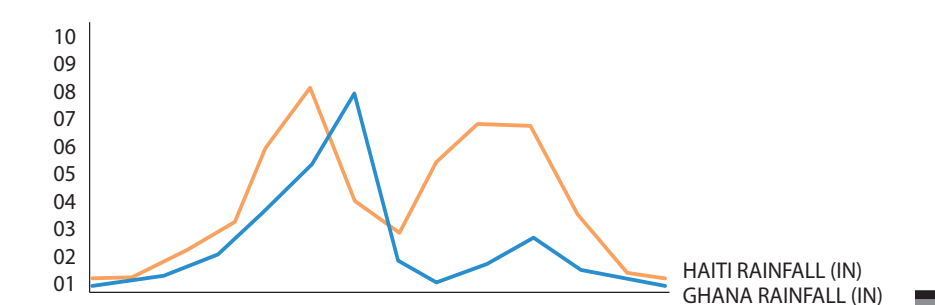
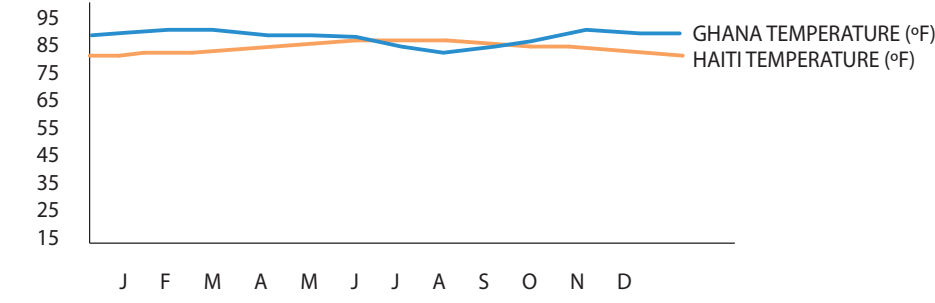
## CONTEXT

### Stats

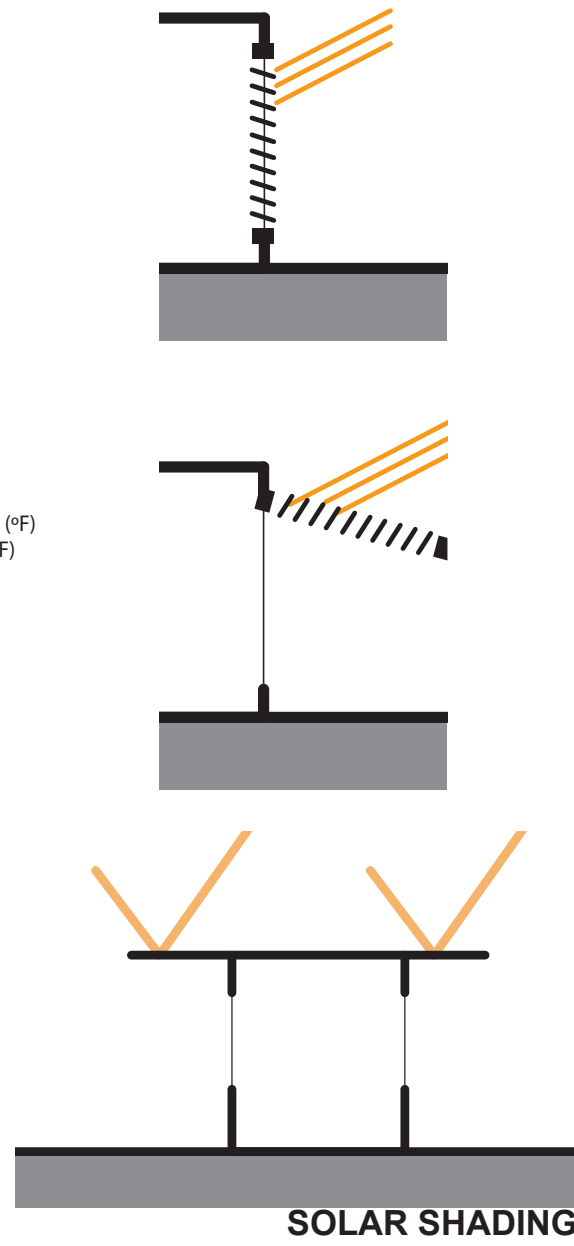
- Ghana is located in West Africa situated between Côte d'Ivoire, Burkina Faso, and Togo in Sub-Saharan Africa.
- Although Ghana is an associate member of La Francophonie, its official language is English.
- The population of Ghana is roughly 24 million people.
- The country is divided into ten administrative districts and is sub-divided into 170 smaller districts.
- Ghana is the second-largest producer of Cocoa.
- Ghana was listed as the fastest growing economy in 2011 with an economic growth of 20.146%.
- It is bordered to the South by the Gulf of Guinea and lies between 4° S and 12° N latitudinal lines and 4°W and 2°E longitudinal lines, placing it only 5° North of the equator.
- The topography of Ghana consists mostly of flat plains and low hills with few rivers, with the Volta Basin taking up most of central Ghana.
- The country of Ghana has only two seasons, wet and dry, and the climate is classified as tropical.



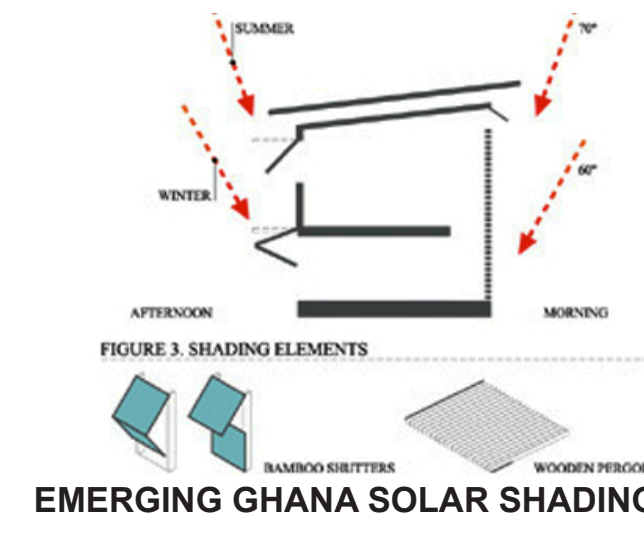
CAPE COAST, GHANA



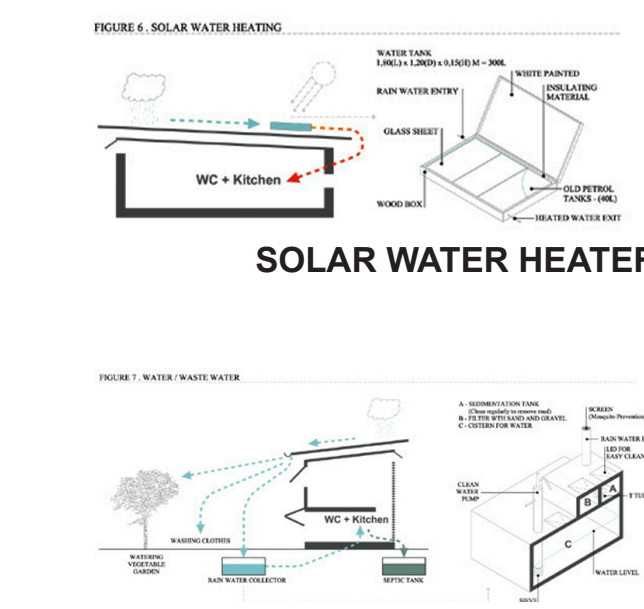
CLIMATE DATA



SOLAR SHADING

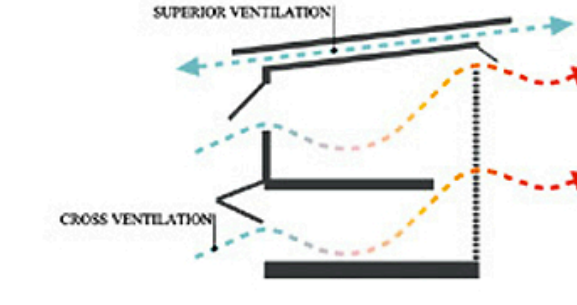
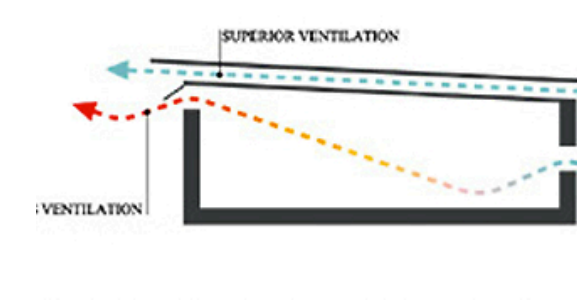
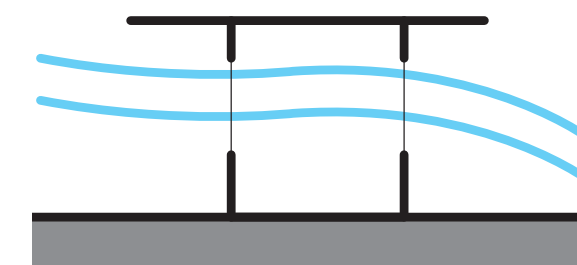


EMERGING GHANA SOLAR SHADING

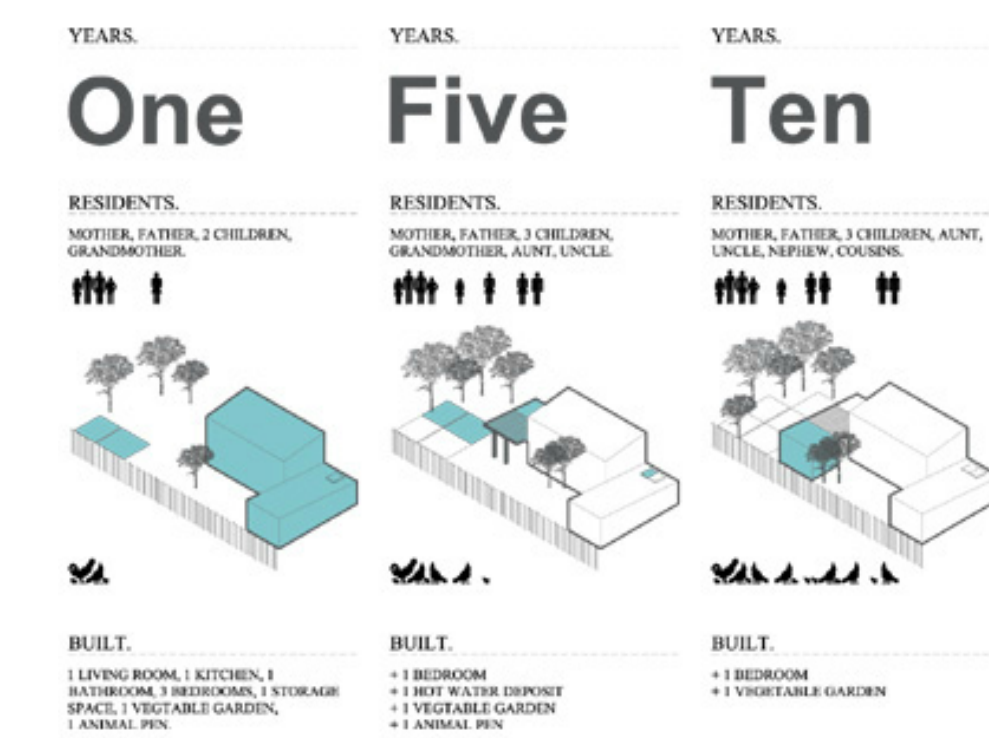
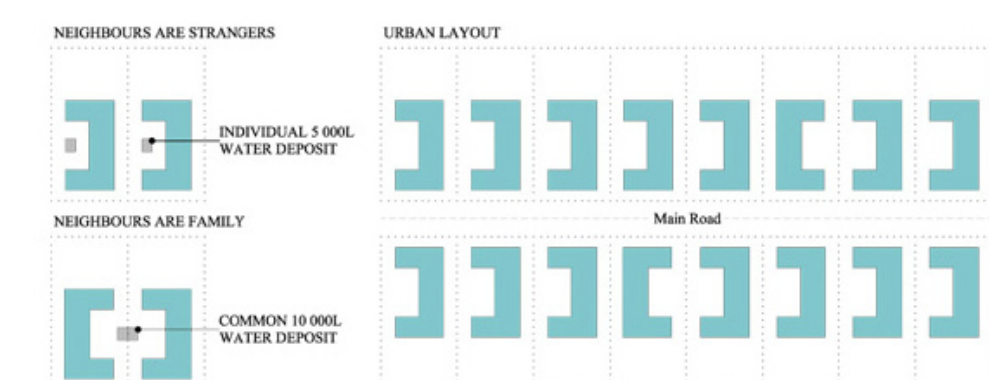


SOLAR WATER HEATER

WATER COLLECTION



CROSS VENTILATION



COMMUNITY SCALABILITY

The design of the Emerging Ghana residence includes a very public area similar to the Haitian porch. Like in Haiti, this is a place for people to gather and socialize. In the design at Ghana, the operable shading extends down to cover this porch, allowing it to remain cooler year round. As similar as the climate is to Haiti, we found it very interesting that similar archetypes developed in two completely different countries that are so far apart from each other.



PORCH CULTURE

## LIFE

### Living Environment

Rural homes are much less structural and probably much smaller depending on the size of the family; therefore, rooms are distributed hierarchically. They may include several rooms, including a kitchen, bathroom, living room, and verandah, where most of the day's activities take place.

### Food

The traditional kitchen in rural houses contains a wood burning open hearth that is recoated every day in fresh white clay. Standing in the hearth is a tripod for holding the stew pot, while fresh wood is stacked up at the side, ready for use. There is also a covered stove, fueled by charcoal, which is used for faster cooking, such as frying.

### Community

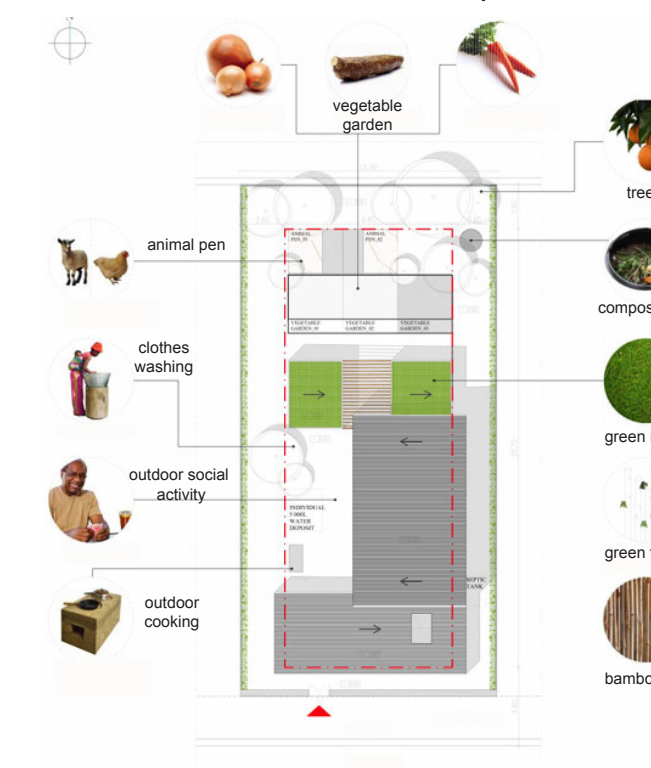
Old tribal structures are still very important in rural areas. The head of each family is not only responsible for his own nuclear family, but his extended family as well. Many communities are made up of tribes where all the families are related, and others are made up of many homes where there might be an entire extended family living under one roof.



## HOUSING

### Amenities

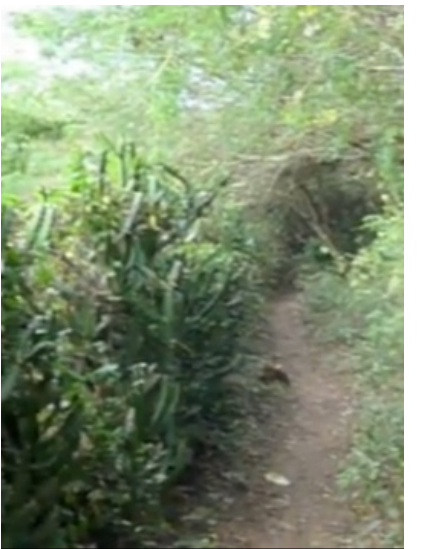
A couple of the most important amenities that the Emerging Ghana project incorporate are a design that allow for cross ventilation through grated windows as well as design measures to insure passive solar gain and cooling. The Emerging Ghana project was also able to incorporate amenities that the native people would typically live without, but is also tied to their culture. The house contains a vegetable garden, green roof, green fence, animal pen, outdoor stove area, outdoor area designated for clothes-washing, tool storage for gardening and livestock areas, typical closets for indoor storage, and an outdoor cool-water deposit.



For the native people of Ghana, having individual sleeping spaces is a luxury in its own right. Most of the people in the country hold steady jobs with a middle-class income, most are still confined to slums due to rapid urbanization, wastage of resources, expensive building materials, inefficient construction methods, and architects who do not share the native ideas. Because of this reason, having individual sleeping quarters that are both private and clean is a huge amenity to the people of this community. The building model, Ashanti, serves as a precedent for the project. This type of building has an open courtyard similar to the Emerging Ghana project. Emerging Ghana also incorporates an outdoor social area. The Haiti project and Emerging Ghana both incorporate these elements in their designs to appeal to the native clients and offer them comfort and security.



We found it interesting that in the culture of Ghana, as well as the Haitian culture, the use of vegetation as a barrier is a common technique used. In Emerging Ghana, the designers created a green fence made of bamboo and other vegetation. In Ghana, it is common to have planted cacti along walking paths in order to serve as a boundary and barrier. Though these two cultures use different vegetation for different reasons, the parallel is significant.



VEGETATION AS A BARRIER