Seung-Ho LEE, Architecte DPLG

A reflection through the architectural project, Accommodation building design for CCDM *(Chad Caummunity Development Mission)* in N'Djamena

Photographer : BASTIEN DEFIVES
http://www.transit-photo.com/projets-collectifs/personnal/terres-de-savoirs/

I-Dream is an association that has a goal to contribute for the inclusive development for developing countries.

This association is composed by members with specialities in different fields.

CCDM (Chad Community Development Mission)

One of this association's members, Mr. Guen-Sun Park is acting as I-DREAM representative in Chad and also works with a local evangelical church. With financial support from the church, he and his associates in Chad have a project a training center construction for the professional training of local people.

As part of the African project activities of I-DREAM, an architectural support team composed by three volunteer architects, Mrs Insun LEE, Miss So Young HYUN and myself has visited N'Djamena, the capital city of Chad in January, 2016.

The mission of the architectural support team

The mission of the architects is to design two buildings, (1) the training center and (2) its accommodation building for volunteer trainers who come from abroad.

During a week's stay on site, the following key objectives have been established:

- Analyze the materials, available in the local market
- Design the buildings, adapted to the local climate and optimized for the operation
- Design the systems and the equipment against to the instability of urban energy and water supply
- Maximize the use of local handmade bricks, led by Mr. PARK

The architects team has then divided the workload; (1) the building design of the training center is supported by Mrs. LEE, (2) the accommodation building design is supported by me, and (3) then Miss HYUN deals with energy audits of the two buildings.

Analysis of current materials and construction methods

1. Wall

Reinforced Concrete structure with concrete block filling wall

Analysis of current materials and construction method

2. Roof

Steel truss frame with steel sheet roof

Analysis of current materials and construction method

3. Slab and ceiling

Concrete beam and block floor and timber frame plywood ceiling

Design evolution of the accommodation building

A draft of the accommodation building was quickly shared in February. It was a typical building in the urban areas of Chad - a reinforced concrete structure. But concrete blocks filling walls is replaced by handmade terracota bricks. The roof is made of metal truss covered by steel sheets. All material and construction system were available in N'Djamena..

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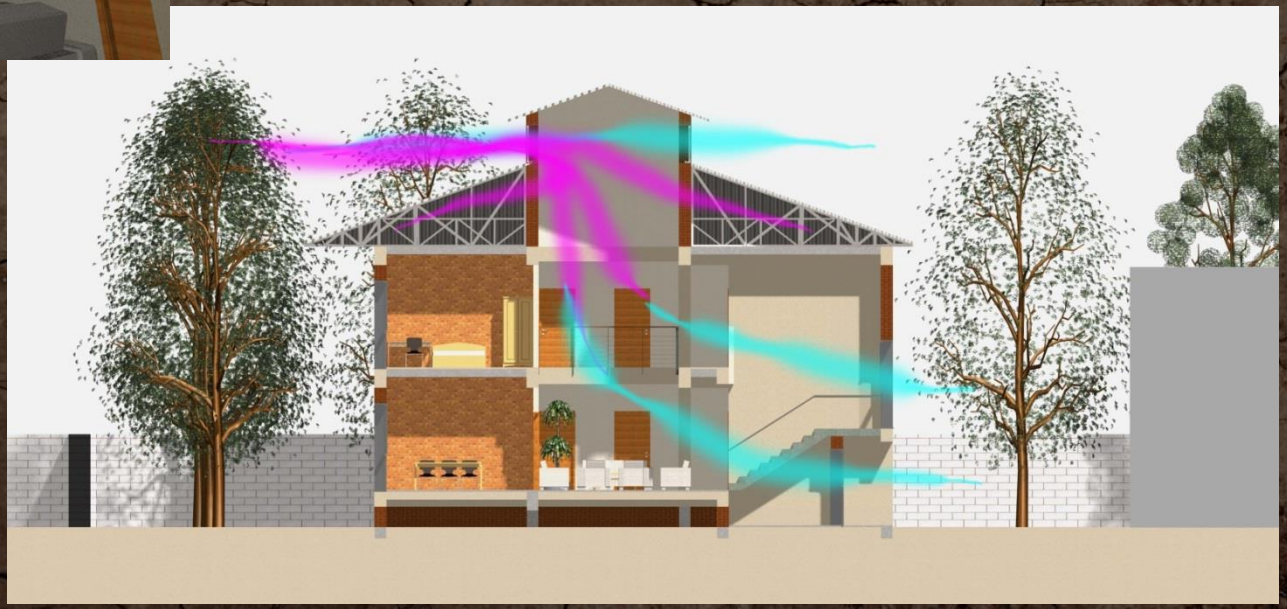
Bioclimatic system

A central atrium generate natural ventilation by convection



Research questions

Although the chosen materials are available on local market, most of them are imported from neighboring countries. This point was a trigger for the reflection on the concept of appropriate technology.

Reinforced concrete :

- 100% of reinforcing bar is imported
- Long distance transport of aggregate
- Local price of cement 10€ per 50kg bag (this selling price same in France, but the average monthly salary in Chad is only 60€ against 2 125€ in France)

Roof materials :

- Almost all steel materials are imported

Timber

- Almost all timber wood and plywood pannel are imported

Research questions

"Why we need to reproduce the same architectural style and the same construction methods as those of Western countries in a country that has a completely different climate where raw materials are not produced locally?"

For the modernity? For more comfort?
Traditional raw material is not compatible in urban area?

If you have lost faith in earth architecture, take note:
Yemen's Manhattan of the desert boasts 400 habitable clay towers!

Shibam citadel 16th century, Yémen

Jialiang Gao www.peace-on-earth.org

Reflection of Building Materials and Construction Methods in Developing Countries

EKC 2016 Berlin / Session ID2

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Nubian vault house, Burkina Faso

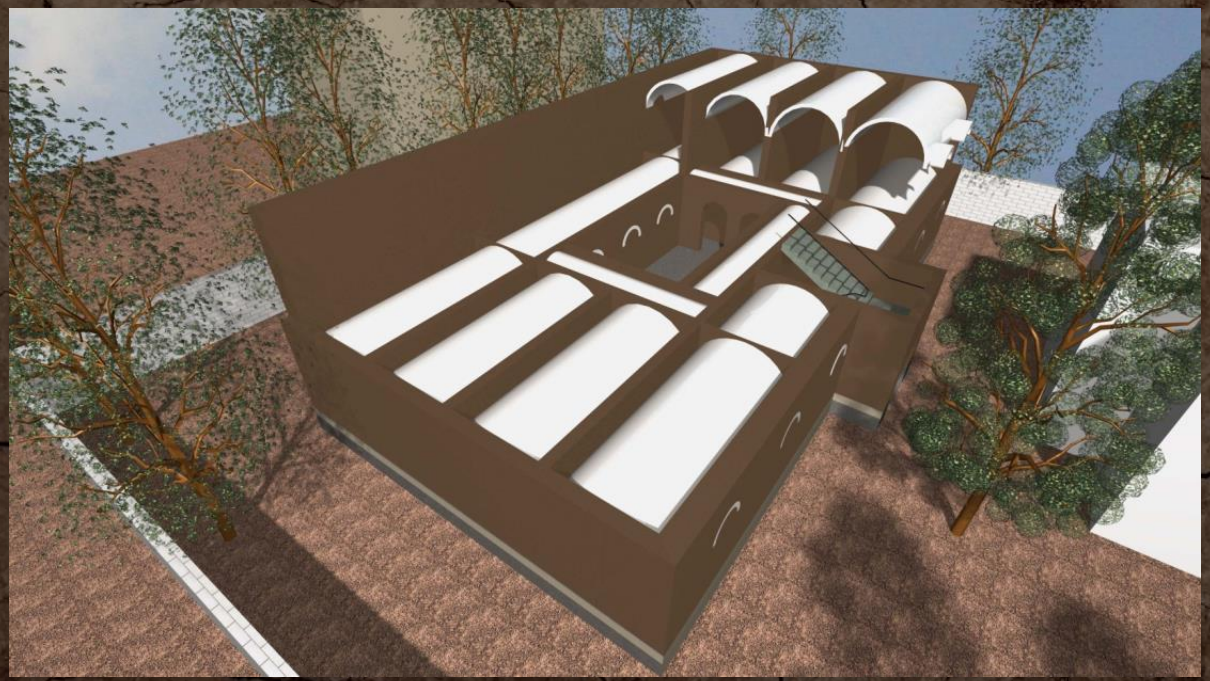
Mosk of Djenné, Mali

Case Musgum, Mayo-Kebbi Est, Chad

New Gourna Village, Luxor, Egyte

Alternative with soil brick

A second draft, a building of two floors built with 100% soil brick and terracotta brick was therefore developed in March. Several vaults made by compacted soil bricks form the floors; all walls are also designed for compacted soil bricks. The steel sheet roof with metal truss was replaced by a membrane in the form of a tent that optimizes building cooling by natural ventilation. This second project significantly reduces CO_2 production, as most raw materials are local origin and not imported as a finished product. Moreover, the manufacturing of soil brick doesn't require energy consumption.



Alternative with soil brick

Alternative with soil brick

Bioclimatic system with tensile roof tente

Final project : Lost of faith

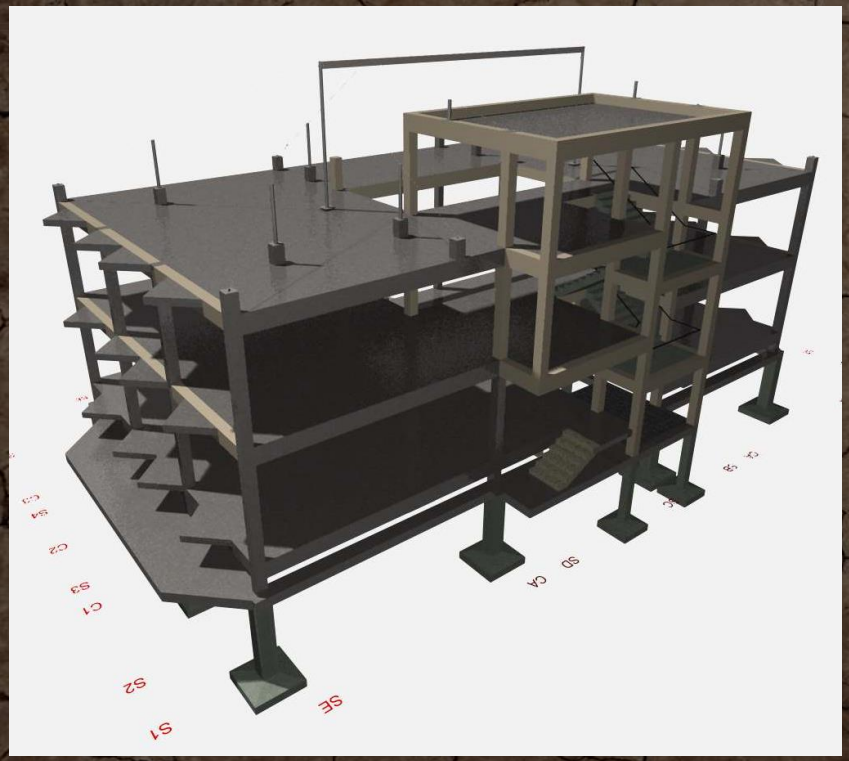
This second project design was not accepted by local decision makers in Chad.

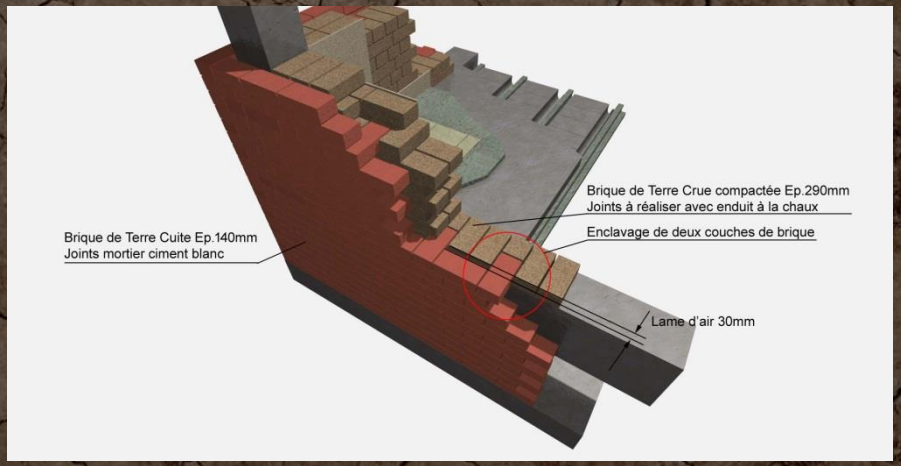
The reason for refusal was even less convincing;

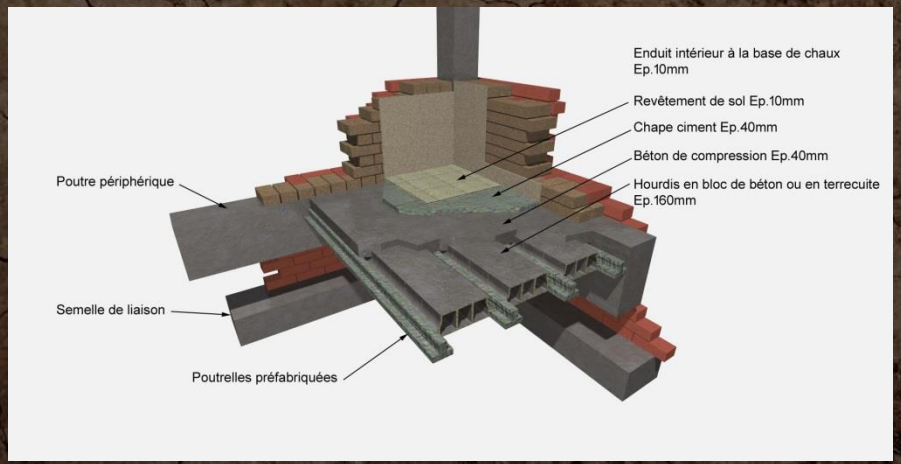
« the soil brick is fragile... »

Following this disappointing decision, a third design was completed using again the reinforced concrete structure but with the membrane roof.

Final project







Final project

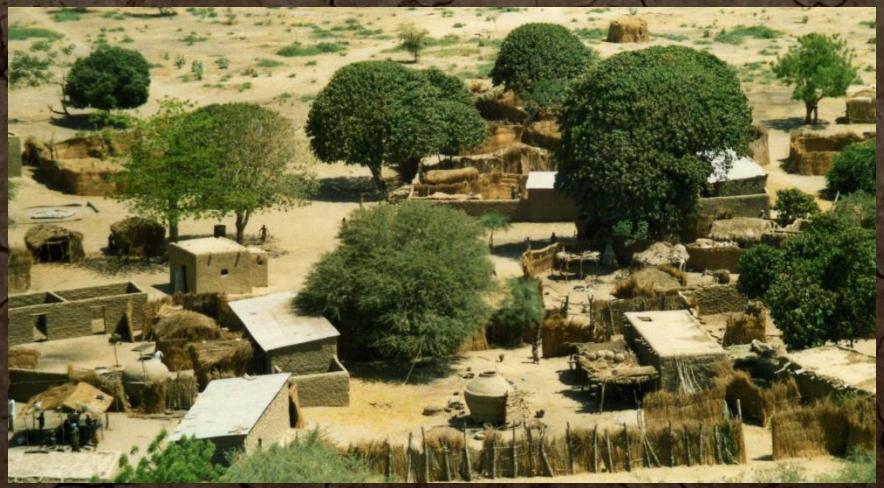
Final project

Final project

Through this presentation of an architectural project, a question could be raised for a collective reflection;

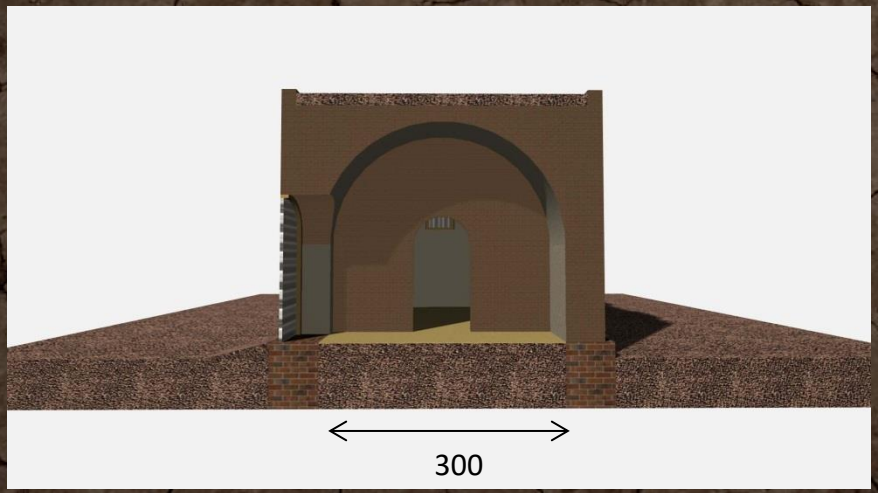
"What is the appropriate architecture in urban area for developing countries?"

New challenge



New challenge

3X4 house, march 2016



New challenge

3X4 house, march 2016

New challenge

- Research of architectural typology and constructruction with local raw material
- Inclusive development experience with local people
- Know-how transfer and training for local people
- Regain faith in appropriate architecture by a flagship project

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