**Workshop 7 - Sustainable Building and Construction**

**Key ideas:**

The main challenge in Africa is construction, to avoid the question of renovation or rehabilitation being raised in a few years' time and to ensure that the construction sector is no longer one of the main factors in greenhouse gas emissions. Green construction and buildings are part of the several MDGs and are therefore essential for achieving sustainable development.

The objective of the workshop is to produce a concrete roadmap with the 1st stage of actions and to have a map of what is being done.

Following the presentations on the state of play of the construction and building sector in Africa, various projects were proposed:

- **Global Alliance for Buildings and Construction** currently working on an African Roadmap for Buildings and Construction
- **The Nubian Arch** which proposes a construction technique adapted from an ancestral African technique used in the Sahelian areas with the use of local materials and the training of the workforce at the local level.
- **Ghanaian architectural firm** orthner orthner orthner & associates - OOA which presents these green buildings, more technological but which integrates local art and materials present on site.
- **TyCCAO** which aims to use typha (invasive plant) as an insulating material.
- **EDGE Buildings**, which consists of an online platform, a green building standard and a certification system for more than 150 countries. EDGE identifies the measures to be taken to have a green building, shows how much you have to invest and how much you earn.
- **Building Efficiency Accelerator** as a support tool for cities and a multilateral platform of companies, NGOs, helping local governments take action to improve their construction.

- **Introduction Ronan Dantec, président of Climate Chance**

  - In France, debate on the rehabilitation of the old housing stock, as building emissions are one of the main factors in greenhouse gas emissions in France. Most of the French park was built at a time when there was no climate change problem. Today, very significant investments are needed for renovation.

  - We must therefore build in Africa in such a way that in 30 or 40 years' time, we will not have the same difficulties as in France today. The essential challenge is to ensure that what is being built today in Africa does not raise the question of renovation or rehabilitation in a few years' time.
• The objective is to produce a concrete roadmap with the first stage of actions, to have a map of what is being done, a dissemination of good practices, an information capacity and to see if there is funding to support the projects. This is necessary in order to have a basis for generalized action.

• The major challenge for the workshop is to come out with a roadmap that starts with the basics.

• We have difficulties due to a bad construction 40 years ago, don’t make the same mistakes.

• Yves-Laurent Sapoval

• The workshop should be a time for discussion.

• The construction sector accounts for 1/3 of the world's GHG emissions, 80% of what will be built in 2050 in Africa is not currently being built. Real estate in the world represents half of the world's wealth. The demand for air conditioning is the fastest growing demand for energy.

• However, energy is a scarce commodity, it will become increasingly scarce in the future, and efforts to deploy renewable energies are essential. But renewable energies will only cover half of the world's energy needs. Energy poverty will become a crucial issue for much of the world.

• Two paths:

  • Energy is used to cool and warm homes

  • Let's save our energy for our primary needs.

  • The most efficient energy is the one we do not use. There is a revolution to be led in the field of construction. The real luxury is the design and buildings that work with nature.

• Hélène Sabathié Akonor ADEME

• Tropical climate issues studied with the French overseas territories, focus on buildings in humid and tropical environments.

• By 2050, with increasing urbanization, 75% of buildings are to be built. Here, the challenge is construction and not renovation as in the North.

• Cities are also developing in coastal areas with a problem of rising water levels.

• Before saving energy through equipment, we must return to the basics, to what was done before electricity. Take into account the lessons of the past and build according to local practices. Combining modernity with traditional practices.
- UNEP on buildings. Green building council = important partners. **Green building du Ghana : Foster Akonor**

We must look for solutions and do our best to understand climate change.

Net zero energy video. By 2050 it is expected that all buildings and constructions will become energy neutral (energy net zero).

We need energy-efficient and environmentally friendly buildings, which meet different sustainable development objectives:

- 1 Reduce poverty by creating jobs in building construction,
- 3 Good health and well-being: quality of the indoor environment,
- 4 Quality education: improving our school buildings to make them comfortable,
- 5 Clean water and sanitation: helping to store water,
- 7 Affordable and clean energy,
- 8 Decent economic growth: green jobs with recycling of building materials,
- 11 Sustainable Cities: Green buildings are the fabric of sustainable communities,
- 12 Responsible consumption and production: circular principles for the production of materials,
- 15 Life on Earth: Green buildings improve biodiversity
- 17 Partnerships to achieve objectives

- **3- Vincent Kitio architecte : Planning and building for all: challenges and opportunities**

The goal: affordable homes for all. We need to understand the context of buildings, which are the key actors of climate change.

Specific challenges of buildings in hot and tropical climates in the 21st century: rapid population growth, rapid urbanization, poverty, climate change (floods...)

Huge need for housing and buildings because 60-70% of Africa’s urban population lives in dilapidated habitats. The housing need by 2025 in African cities is estimated at more than 300 million.

ONE Habitat Project: giving houses to all but in reality decent housing is not affordable. And mass housing does not take ecological considerations into account, so the strategy must be rethought.

We need to look at the type of equipment we are going to use, funding is not the beginning, we must first address this issue of access to land.
Then for the design and construction of the building, there is a shortage of architects/technicians.

Alternative materials for labour-intensive constructions must be sought. But with a need to industrialize the construction sector. Focus on building codes.


Ongoing work: African roadmap for buildings and construction

Nairobi May 2019: 25 experts on housing affordability with the main actions and themes being building renovation, materials, resilience and consideration of polluted land, experiences of climate events, according to baseline, short term, medium term and long term.

**Yves Laurent Sapoval** : At the COP and in the Global ABC, there is a lot of work to invite governments to join the alliance and give roadmaps for action. But the action of local authorities is also essential. Ex: city of Dakar.

- **4- L’association La Voûte Nubienne**

Dynamic responses adapted to the evolution and construction sector in the Sahel

Housing challenge in Africa with the use of imported and exogenous know-how and a loss of African architectural tradition.

A construction technique adapted from an ancestral African technique used in the Sahel areas. Only local materials, the main one being soil. Simplified and standardized process. Houses that are more comfortable in terms of thermal, acoustic and sanitary comfort, but also resistant to violent weather episodes.

Labour-intensive technology and few machines, moulds for sun-dried mud bricks. Standardised technique in terms of building width, modular length.

Core target: rural areas and very poor households but possible to build in urban areas, very modular technique for building multi-storey buildings or collective buildings.

Disseminate the technique using the market approach, create market dynamics by training a trade in this technique (supply), create demand by raising awareness of the technique among the population and project owners.

Different stages of this methodology:

- Conceptualization,
- Launch the market (15 years),
- Densification of the market (insist on mason training and create the offer),
- Today, the methodology is proven and therefore technology transfer to local partners
- Impact in terms of employment, climate (adaptation and mitigation). Association present in 5 West African countries. 2018: 32,000 beneficiaries, 3,000 construction projects completed, 770 active masons, 25% annual market growth, 85,500 tonnes of CO2 avoided, strengthening local economies by avoiding the import of materials.

- Functions:
  - Technical support
  - Monitoring and evaluation
  - Development of own technologies
  - Partners to promote the market

- How to get involved in the program: in the territorial diffusion of our technology, implement construction budgets, choose the Nubian vault technique for community/public buildings

- 3 years: 65,000 euros: train a local organization to promote the VN market, 36 learners

- 350 euros per building: incentive for customers from poor rural areas to build the house, no donation but incentive to choose this technique

- 190 euros m2 for construction

- Need for an operational, financial partner

- 5- Bureau d’architectes ghanéen: orthner orthner & associates - OOA

  - Green buildings, more technological.

  - Main problem: reduce heat in tropical areas. Solutions for water and heat saving: a bio-digestive system linked to an irrigation system.

  - Bamboo construction according to local culture and including local art.

  - Affordable home for $15,000.

  - Small and simple local concept for more luxury. Luxury does not mean great and brilliant. Small to be more energy efficient.

  - Sustainable development is not expensive.

  - Moderator: there are technical solutions and solutions for all construction markets. Solutions adapted to all categories of population. Hélène Sabathié Akonor: PEEB Energy Efficiency in Buildings Program

5 pilote countries including Sénégal.
Projet TyCCAO

- Typha is an invasive plant that invades everything, poses a problem for biodiversity and leads to the development of diseases (nests to mosquitoes).

- A futile and costly fight to eradicate typha, we must try to take advantage of this plant: advantage in terms of insulating structure for better insulation, less imported materials, less emissions and energy consumption.

- In insulation, roof protection is the most important thing, protecting the roof saves 70% of the heat that enters the building.

- 4 parts:
  - Better knowledge of the resource: define the collection areas and the areas to be left, improve the cutting technique and the processing of the material
  - Valuation of typha as a coal fuel
  - Valuation for construction: earth/typha, concrete/typha combinations
  - Capitalization

- Participation in international meetings, ex FIBRA world first prize for contemporary vegetable fibre architecture.

- **6- Timothy Blatch ICLEI** : Building Efficiency Accelerator

  - The BEA is a support tool for cities, a platform for engagement for the city.
  - 3 objectives:
    - Universal access to modern energy services
    - Energy efficiency: 6 different sectors, the building is a key sector
    - Multilateral platform of companies, NGOs, helping local governments to take measures to improve their construction
  - 3 dozen partners including World GBC. Supported by the Global Environment Facility. Offices all over the world. New partnerships are built around public-private collaboration
  - The BEA is in fact the complement of an action work, it is a support:
    - Process for setting priorities for local action,
    - Expertise and solutions in tools,
    - Funding opportunities,
    - International recognition and collaboration.
  - A call to action to all those present in the room who work in a local government
- Make your contribution clear: Adopter et mettre en œuvre une politique habilitante pour institutionnaliser les efforts d'efficacité énergétique des bâtiments,
- Pilot program: Demonstrate the potential of building energy efficiency, designed to be adapted for use in other buildings,
- Monitoring and communication.

Two ways: register to become a partner / Africa Regional Network (meeting place, partners, case studies)

Global Alliance for Building and Construction: Member of the Steering Committee

Moderator: Objective to create a network of municipalities that want to work on buildings. It's not easy to find the right people to talk to. We want to create a central network of municipalities that want to work together. For the next Climate Chance, we want to have a real assessment of what municipalities have accomplished.

- 7- Projet **EDGE Buildings**

International Finance Corporation (IFC) four-part strategy to support investment in green building:
- Investment and advice for banks
- Provide facilities
- Investing in the construction sector
- Encouraging the adoption of “green” construction methods through: property taxes, subsidies, permits, height bonuses, etc.

EDGE is an online platform, green building standard and certification system for more than 150 countries. The EDGE application helps to determine the most cost-effective options for designing green buildings in a local climate context. EDGE can be used for all buildings, new or existing, and for major renovations.

EDGE identifies the measures to be taken to have a green building, shows how much you have to invest and how much you earn. It is accompanied by an audit instrument that simplifies the compliance of the work performed. The application adapts to the characteristics of the country, it is specific to each country.

The value of EDGE certification is a promotional advantage, as customers benefit from lower utility bills.

EDGE is part of a holistic strategy to guide construction in rapidly urbanizing economies towards a more low-carbon path. This is an example of IFC’s commitment to creating competitive, sustainable, inclusive and resilient markets.

Ghana’s return on investment would be 20% efficiency.

- **Desmond C Appiah**

How to build dense cities in the face of urban sprawl and the degradation of nature?
Problem of mobility for people who want to come to the city centre. Need for planning.

In Accra: a key instrument is the building permit regime that impacts what needs to be built. But there is a problem of enforcement and respect for the law. Energy efficiency must be promoted, especially in schools, and cities must be encouraged to go green, including by increasing the use of renewable energy.

- **7- Plan Climat Energie Territorial à Dakar par Ndeye Rokhaya Sarr**

Dakar is a very dense city with many unhealthy infrastructures. 30% of the city's energy consumption comes from the building sector.

Improvement program:
- Climate and Energy Plan of the territory
- Awareness-raising of stakeholders
- Energy Efficiency Project

Example of an eco-friendly geriatric centre built with typha to insulate the roof.

- **Projet Climat Energie de la ville de Pikine** (officiellement la deuxième ville la plus peuplée du Sénégal)

  Question of the safety and solidity of constructions, particularly with the use of new materials.

  We must not forget the environment in which the sustainable building must be built.

**Questions:**

- What kind of energy for a hut? No cement floor, no air conditioning. High-tech technologies are not suitable.
- How can we densify the old structures to reduce the rate of urban sprawl and urban growth? The problem of the lack of available land must be addressed.
- How can we educate and train the population on the issue of climate change through the theme of buildings?
- What access to affordable housing? Renting, social housing? Question of the material used that affects the price.
- How to adapt existing houses and convince their inhabitants? Solutions must be found to deal with climate change by staying in their homes.