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The SURE-Africa Project: Sustainable Urban Renewal – Energy Efficient Buildings for Africa

ABSTRACT: This paper summarizes the results achieved by the 3-year E.U. SURE-Africa project. The project aims at strengthening knowledge and its application in practice, contributing to a sustainable development through the vital area of energy efficiency in buildings and cities, and, ultimately, to reduce poverty. Academic and professional expertise from three E.U. Universities - namely the Higher Technical Institute (IST, Coord, Portugal), the University of Cambridge (UK) and the University of Lund (Sweden) - was organised to set up a data-base of information, in cooperation with Academic Institutions in Portuguese-speaking African countries (Angola, Mozambique, Cape Verde and Guinea), with information about tools, case studies and teaching material in the field of sustainable, energy-efficient building and urban design. Seminars, workshops and conferences were carried out, and best-practice Manuals are also being published as a final outcome of the project.

Keywords: Urban Renewal, Energy Efficiency in Buildings, Africa.

1. THE SURE-AFRICA PROJECT: INTRODUCTION

The project aimed at strengthening knowledge and its application in practice, contributing to a sustainable development through the vital area of energy efficiency in buildings and cities and, ultimately, to reduce poverty. The situation found in the participant countries was representative of many other countries in Africa, with developing economies often scarred by long-term armed conflicts. Building and urban renewal have an urgency that requires a different approach to the incorporation of renewable technologies from that in Europe. This is due to the scarcity of resources, the pressing demand for social housing and refurbished or new public buildings such as schools and hospitals, and the difficulties of implementing building and town planning regulations (often deficient or even non-existent).

It is important to consider energy conservation through passive building design as a proven equivalent to renewable energy power generation. The project adapted well-established knowledge in this area to the economic and climatic context. Emphasis will be on net demand reduction rather than generation; this approach making less downstream demands for maintenance and replacement, and being more compatible with traditional life-styles. In non-domestic buildings, a high priority was the avoidance of air-conditioning. In the case of housing, it is important that basic comfort performance criteria are met, since failure in this respect will prompt the occupants to purchase package air-conditioners if and when reduced costs and improved finances allow.

The project has also drawn from existing areas of expertise in post conflict reconstruction, trying to resolve inevitable conflicts between the short-term need, and the longer-term imperative of sustainability. It recognised, that in the area of housing in particular, there is much self-build, and it was acknowledged that the support materials must not only be accessible to the design professional but to the layman as well.

The overall objective is to create a network of practical and scientific knowledge between African and European Universities, in the field of energy-efficient building and urban design. Training workshops, Seminars and Conferences were held in each of the African countries involved (Cape Verde, Guiné-Bissau, Angola and Mozambique). Within this programme different target groups (local politicians, teachers, professionals, students, self-builders) were addressed at appropriate levels.

Academic and professional expertise from three E.U. Universities - namely the Higher Technical Institute (IST, Coord., Portugal), the University of Cambridge (UK) and the University of Lund (Sweden) - was organised to give the lectures at all training courses and workshops, and to contribute to documentary material. A database of

information was set up, in cooperation with Academic Institutions in Africa, with information about tools, case study exemplars and teaching material in the field of sustainable, energy-efficient building and urban design. Best-practice manuals are also being published as a final outcome of the project. The basis for long term collaborative research on energy efficient and sustainable construction were developed during this 3-year E.U. COOPENER project.

2. RESULTS

The main, long-term, objective of the project was to establish a network of practical and intellectual knowledge between African and European Universities in the field of sustainable, low-energy building design and construction. The project has enhanced the communication and information exchange between higher education institutions in the EU and Lusophone African countries in the field.

Several steps were taken for this purpose, following the initial workplan, mainly:

- Development of a website, which is updated regularly as a central resource for information and communication (<http://www.sure-africa.org>).
- Organisation of Project meetings and production of Reports.
- Planning, organisation and realization of Seminars and Workshops that took place in Cape Verde, Angola, Mozambique and Guinea-Bissau, with participation of the various institutions involved. The Seminars and Training Workshops were designed based on the identification of the specific needs and constraints existing in each of the African countries involved, and successfully delivered.
- Development and completion of the Best-Practice Manuals and teaching material. The Best-Practice Manuals are pioneer publications in this area (a reference not only for Portuguese-speaking countries but also for other African countries), and are one of the main outcomes of the project.

2.1 The Seminars and Training Workshops

Together with the publication of the Best-Practice manuals, the realization of the various Seminars, Training Workshops, and Conferences were one of the most important achievements of the project. These three types of events were distinct in nature. The Seminars consisted on series of presentations, with moments for queries between each presentation, and audiences involved a diversity of attendees, from Government and Local Authorities Representatives, to Professionals of the Building Sector (Architects, Engineers, Builders, Representatives of the Professional Orders and Associations), Academics and Students. In general, attendance was made by Invitation (from the Local Team Coordination). The Training Workshops were mostly

directed to University Students and Professionals (mostly Architects and Engineers), and took place generally after the Seminars (where various presentations were made); in these, discussions were encouraged on various topics, questions (of a practical nature) were posed and answered, and case studies were analysed. The Conferences were opened to the general public, including a broader audience, and were generally opened and closed formally by important personalities (Government, Dean of the University).

The Seminars in Angola took place between the 26-29th May 2009. The Seminars, Training Workshops and Conference took place in the premises of Faculty of Civil Engineering and Architecture of UAN. The seminars took place in the first days, to an audience of mostly students, academics and professionals.

Informal workshops were realized after the end of each day, mostly with students, where a number of issues were debated. The final event was a conference, opened by the Minister of Environment and the University Dean, where a series of presentations were made, both by Local (e.g. Town Hall Architects and Engineers, University Staff) and EU experts.



FIG 1: Photo of the SURE-Africa Seminars in Luanda (May 2009)

In Cape Verde, two series of Seminars and Workshops were carried out, one in Praia Island (City of Praia, Capital of Cape Verde) and another in the Island of S. Vicente, at the M_EIA premises (City of Mindelo). Attendants were mostly professionals (Architects, Engineers), Academics, and representants of local Government (Town Hall) and the Order of Architects and Engineers. A final conference was also realized

in Mindelo (in collaboration with other institutions), at the Town Hall, opened to the general public.



FIG 2: SURE-Africa Seminars in Praia (left) and Mindelo (Right), Cape Verde (March 2008).

In Guinea-Bissau, the final Seminars took place in between 07/12/2009 and 09/12/2009. Both the Seminar and the Conference (at the Franco-Guineese Institute' Auditorium) had a high-profile attendance, including representants of a number of Official and Private Institutions.



Figure 3: Photos of the SURE-Africa Conference (left) and Seminars (right) in Bissau (Dec. 2009).

In Mozambique, the Seminars and Training Workshops were carried out between 04/06/2009 and 07/06/2009. The Seminars' audience in Mozambique was about 90-100 people, mostly representing State Institutions, Academic Staff, and students. Some NGO's were also present. A special presentation was made for students only on the 7th, at the Faculty.



Figure 4: Photos of the SURE-Africa Seminars in Maputo, Mozambique (June 2009).

2.2 Publications

A series of publications were produced by the project, being the most important ones the Best-Practice Manuals and Teaching Material (Brochures and Slides). A number of other publications were also produced, namely press releases and advertisements made during the Seminars in Cape Verde, Angola, Mozambique and Guinea-Bissau including TV and radio news and interviews, web postings, posters, flyers, etc.. However, the bulk of the publications were the Best-Practice Manuals - a reference not only for Portuguese-speaking countries but also for other African countries, and are one of the main outcomes of the project.

One Manual - "Manual of Sustainable Architecture"- was produced for each country involved: Angola, Cape Verde, Guinea-Bissau and Mozambique, with approximately 200 pages each. They are destined to be used by professionals, academics, and general public. The Manuals include a general overview of the local context (social-economic, climatic, cultural, local resources and technology, etc) and present a set of design recommendations, applicable to most types of buildings - from self-construction to more complex buildings, such as offices or touristic infrastructures. They also include recommendations on other critical issues, such as urban planning, the use of water, and the use of renewable energy systems. A number of local case studies are presented.



Figure 5: The Best-Practice Manuals: Covers



Figure 6: The Best-Practice Manuals: Covers

3. FUTURE ACTIONS

There is no doubt that the project was the “embryo” for a long-lasting future collaboration. Various research and student exchange protocols are being formalised between E.U. and African Institutions as a direct result of SURE-Africa. A Network of Sustainable Architecture and Urban Design is also being created for Lusophone countries (including Brazil), which is now on the process of being extended to Universities existing in other E.U. and African counties (Francophone and Anglophone).

The consortium is also considering candidacy for new joint projects in the line of SURE-Africa. The E.U. team is at the moment preparing another funding candidacy for a new project, a continuation of SURE-Africa for other Lusophone countries such as S. Tomé e Príncipe and Timor (local colleagues have already shown great interest in joining in), as well as other Francophone and Anglophone countries in Africa. The existing E.U. team will also be dilated to include other EU universities.

The results of the Project are now going to be further disseminated, both in terms of the distribution of the manuals, the maintenance of the website, the participation in International meetings (e.g. SB10, PLEA and WREC), and publication in peer-reviewed magazines. An International Conference on Sustainable Construction in Africa, planned for February 2011 in Lisbon is being organised.

CONCLUSIONS

The general opinion of all teams is that good work was made, with enduring impact. This project was the starting point for future projects, so necessary in the area. The most valuable deliverables were the Seminars, Training Workshops and Conferences, and very importantly the Best-Practice Manuals, which are a pioneer publication in this field of studies.

One is certain of the creation of future long-time links between the various teams of the SURE-Africa project. The project is achieving one of its most important aims: being the embryo for a future extended network of information between EU and African Institutions.