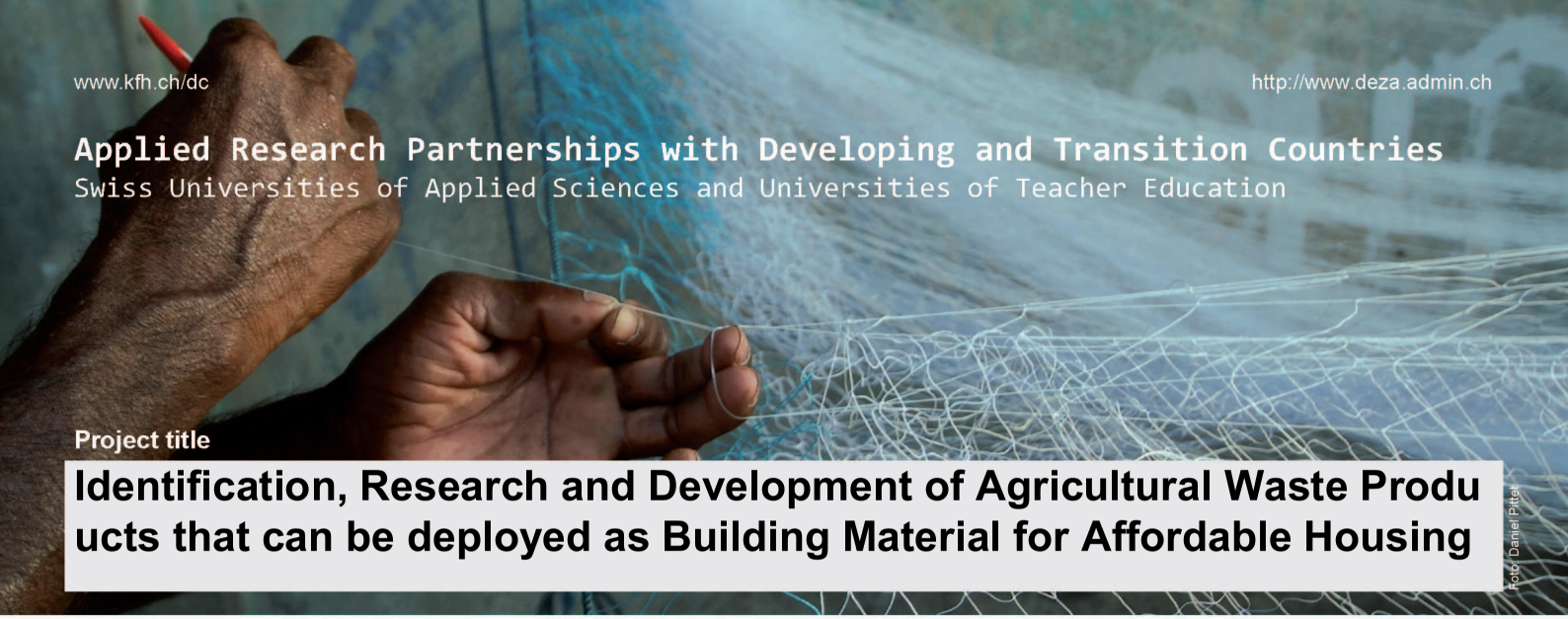
Applied Research Partnerships with Developing and Transition Countries

Swiss Universities of Applied Sciences and Universities of Teacher Education



Project title

Identification, Research and Development of Agricultural Waste Products that can be deployed as Building Material for Affordable Housing

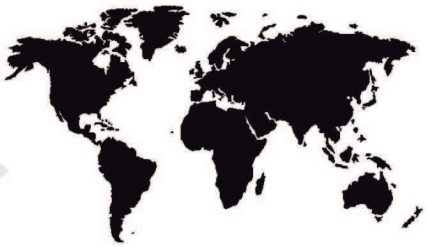
Foto: Daniel Pittet

Thematic focus

Environmental sustainability, Interculturality, Methodology

Year

2010



Project location

Enugu, easten Nigeria & Zaria, northern Nigeria

Swiss Institution

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Partner Institution

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Description

The need for affordable housing has stimulated extensive research aimed at finding cheaper and more readily available building materials. Such research has often focused on waste recycling. In Nigeria, abundant plant-based agricultural wastes from the cultivation of rice, maize and cassava crops are often incinerated or simply left to rot. Natural fibers from these and other materials offer a cheap and sustainable resource which can be readily utilised to achieve a reduction in construction costs. Alternative materials will not only help reduce the amount of CO2 and other toxic gases released into the environment resulting from the production of materials like cement, but also reduce the dependence on imported, expensive building materials.

The project is an ideal research catalyst and an educational vehicle with which to address a range of academic, environmental and socio-cultural issues pertinent not only to Nigeria, but also to many developing economies.

These include:

- Environmental pollution
- Agricultural waste recycling
- Sustainable resource management
- Provision of affordable housing

These core themes are intended as the firm basis of a long-term dialogue that will go beyond academic research.

Development relevance

Fostering entrepreneurship: The research goal of establishing production workshops within the institutions in Nigeria, which would then be in a position to educate and encourage local production of affordable building materials, will help reduce the present dependence on imported, non-sustainable materials. The direct involvement of the local community through an educational institution will help engage both rural and urban audiences, promote economic modernisation and diversification; reducing poverty by offering an extensive labor market and a higher income earning opportunity.

Cement blocks are the predominant building materials. Cheaper alternatives will be researched and produced.

Typical, low-tech production workshop for affordable composite materials. Such facilities will be located in the Universities for research and production.

KFH
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Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Swiss Agency for Development and Cooperation SDC

Main features of the project

Knowledge Transfer and Development:
The project foresees a two-stage development. Whilst the first stage will be based in Switzerland and involve the acquiring of research methodology and production technology, the second, the main focus of the long term partnership, will be in Nigeria. The acquired knowledge and technology will be actively propagated and further developed with local industry partners who are currently being solicited to suit the Nigerian context.

Originality Inter-disciplinarity:
Focusing on new and cost effective ways of utilizing locally available raw materials to meet demands for affordable housing offers a unique opportunity for:
- acquiring engineering production skills
- promoting a multi-disciplinary approach to problem solving by bringing together material engineers, architects, agricultural engineers and local government agents
-encouraging an integrated system of crop cultivation and crop waste management
-researching, producing and utilising composite materials with low technology

Main goals:
We aim to establish an application-oriented research project intended to bear social, economical and ecological impact. The project will disseminate research methodology and production expertise towards a sustainable, interdisciplinary, and intercultural cooperation with four clear aims.

1) To research readily available agricultural waste materials in two geographically and culturally diverse regions of Nigeria, namely: The South, with a tropical rain-forest climate, and annual rainfall between 1,524 to 2,032 mm, and the North, defined by its almost desertlike climate, with less than 508 mm per year.

2) To develop affordable composite building materials best suited to these and similar regions, thus reducing their ultimate reliance on expensive, imported, and therefore non-sustainable alternatives.

3) To research and develop adaptable building solutions and construction methods best suited for the materials produced, thereby learning from, adapting and improving local building skills to the benefit of the local labour force.

4) To broaden the existing cooperation with UNEC which commenced in 2002, from one of traditional material support and training in IT applications, to a research partnership, mutual exchange of knowledge and educational cooperation. The cooperation with two schools not only puts necessary focus on specific cultural and climatic considerations but also results in products that are more economically viable because of a wider user appeal.

Abundant amounts of rice husks that are traditionally incinerated can be utilised to produce building materials

Typical rice farm in Eastern Nigeria.