

Presentation of GERES in Afghanistan

GERES - Renewable Energy and Solidarity Group is a French NGO which provides long term development solutions through the use of renewable energy and energy efficiency. Its 20 years of experience in passive solar architecture in cold climate regions (Indian Himalayan, Nepal, China,...) has been put into practice in Afghanistan in projects carried out with the support of the French Ministry of Foreign Affairs (MAE), the French Agency for Development (AFD), the GTZ (Technical German Cooperation), ADEME (Agency for Environment and Energy Management and various other French donors.

ACTIVITIES of GERES Afghanistan

1. Greenhouses and Verandas

- a) Building of Greenhouses for the production and selling of vegetables to reduce imports, extend the growing season by over 2 months and reduce irrigation needs.
- b) Building of Verandas and Thermal Insulation for private houses in order to reduce fuel used for space heating by up to 90%.



Veranda on Domestic house with thermal insulation upgrades, heating spendings reduced by 90%



Veranda on Domestic house, heating spendings reduced by 50%



Improved Greenhouse (frost resistant)



Greenhouse for productive use

2. Public building

Use of BIOCLIMATIC designs for public buildings (schools and clinics), including SOLAR ARCHITECTURE and THERMAL INSULATION in order to reduce fuel consumption in clinics by about 60% and improve teaching conditions in schools. Solar Architecture has the double advantage of maximizing sun penetration during winter while at the same time limiting it during summer.

OBJECTIVES

For 2006, Geres plans to build about 50 greenhouses and implement Bioclimatic design on about 15 schools and clinics in COLD areas.

DETAILS of BIOCLIMATIC techniques for SCHOOLS and CLINICS

The Geres design which have been approved by the Department of Construction of the Ministry of Education include the following:

A. SOLAR ARCHITECTURE

Description

- Large South face with large windows to collect sun energy during winter. The South face is in fact tilted 15° towards the East to benefit of the sun energy early in the morning. On the North side windows are smaller while providing sufficient day light.
- Very limited East and West windows to avoid overheating during summer.
- 50 cm roof overhang to create shading during summer on the South face. In very cold areas, this roof overhang is limited to 30 cm only.

Cost

The cost of solar architecture is free since it only consists of proper shape, floor layout and orientation of the building. The slope of the terrain can however in some adverse cases, demand extra excavation works in order to satisfy ideal orientation to the South.



Charrikar pedagogical center South face



Behsud Clinic



Laghmani School South face



Laghmani School North face



Dai Kundi Clinic



Pedagogical Center in Charrikar

B. THERMAL INSULATION

Geres has tried various materials for insulation of roof and wall, such as expanded polystyrene (EPS), glass fiber, straw and saw dust. EPS proved so far to be the best choice regarding cost, water resistance, thermal performances, quality and ease of installation. Wool insulation is under study.

The cost of polystyrene sheets delivered in Kabul from Lahore in Pakistan (5 cm thick 12 kg/m³) is in the range of 3.6 to 4 USD/m².

Overglazing of regular single glazing wood windows has proven very effective, using silicone sealant.

Total OVERCOSTS including supply and installation

Roof insulation (10cm EPS)	Double wall (1 ½ brick total) and foundations insulation (5cm EPS)	Overglazing (4mm) Gross window opening
18 USD/m ²	10 USD/m ²	12 USD/m ²

For a school of 12 classrooms 625 m2 double storey building, the price of these thermal insulation features is 17,000 USD or 27.2 USD/m2 of ground area.



Roof insulation with Polystyrene



Roof insulation with Polystyrene



Insulated double wall with Polystyrene



Inside insulation (renovation) with Polystyrene



Overglazing with Silicone sealant on existing wood frame

CONTRIBUTION OF GERES

The FFEM program (French Fund for Global Environment Facility) supporting GERES in Afghanistan participates to 20% of the bioclimatic overcosts (Thermal insulation), the balance being paid by the building owner. GERES looks after proper implementation on site and provides training to all publics (Ministries, Donors, Engineers and Contractors).

Complete set of architecture and engineering drawings for School and Clinics, including installation guides for contractors will be supplied free to any Donor.