

RURAL DEVELOPMENT

AFGHAN REFUGEE HOUSING

Olivier Scherrer

This article was written by a French architect, member of ACROTERRE (Association des constructeurs pour la réhabilitation et l'optimisation de la terre), following an evaluation trip to Afghan refugee camps in northern Pakistan. He went there to assess the success and the problems of a programme begun in 1987 to help the refugees improve their housing in the camps by training them in vault-and-dome building techniques to replace expensive timber roofing. The clear intent behind the project was that the Afghans could then employ these techniques based on mud brick construction when they eventually returned to rebuild their war-ravaged homes and villages in Afghanistan.

EDITORS

House construction generally depends upon self-help among families or among villagers. Although people are often capable of building walls, roof construction is usually entrusted to a mason whose know-how has been handed down from father to son or from a close relation. This is certainly the case with vaulted roofs.

While the large cities of Afghanistan have been relatively spared in the fighting until now, the average ratio of destruction in rural areas is estimated at 50 per cent, although it is impossible to obtain accurate information. The number of houses which have been deserted for years and damaged by lack of maintenance will undoubtedly increase.

It is difficult today to forecast how

many refugees will go back to Afghanistan, partly because of their geographical location (Pakistan, Iran, as well as refugees from inside the country) and partly because of their particular situations (integration in the host country, emigration). Surveys in the camps show that the great majority of them will indeed try to settle back in their original habitat. Their first task will be to start farming again, and the second will be to rebuild

Left: A mason completes a dome roof for a house; it will be totally closed or left open for light and escape for smoke.

Below: The Jalozay refugee camp, in northwestern Pakistan, where the pilot project of introducing dome construction to roof the dwellings was implemented.

PHOTOGRAPHS: SCHERRER/ACROTERRE





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Areas of flat and vaulted roof construction in Afghanistan



Map of Afghanistan showing the geographic location by areas of prevalence of flat roof and vaulted roof construction. Most vaulting appears in the north, west and southwest.

Opposite page, top: Masons and their assistants finishing a vaulted roof.

Opposite, below right: The interior surfaces, like the exterior ones, are coated with an earth and straw plaster. The entire family pitches in to help.

Opposite, below left: The interior of a house in Hazekhel camp illustrates the traditional use of timber beams – now quite scarce and expensive – for roofs.

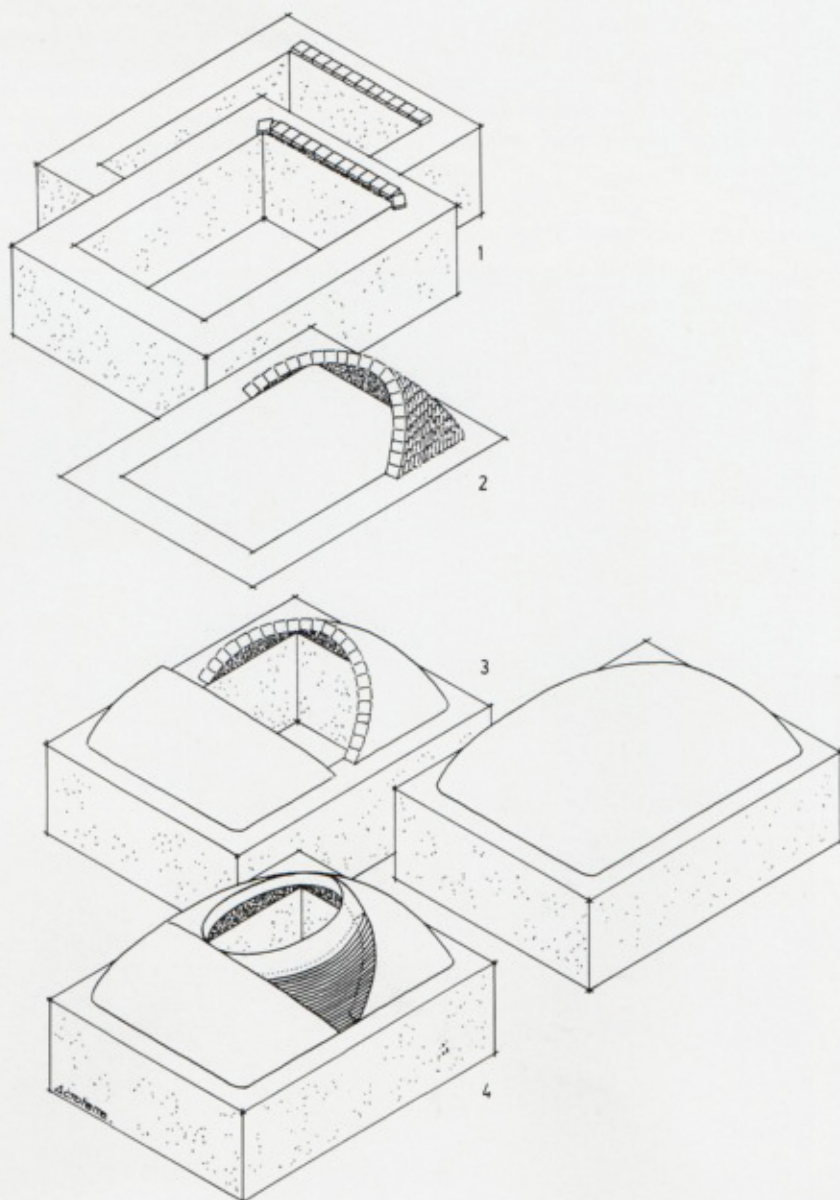
Right: Axonometric drawings of different stages in the construction process of covering a rectangular room with a mud brick vault.

their homes – as the story of this Afghan refugee bears out:

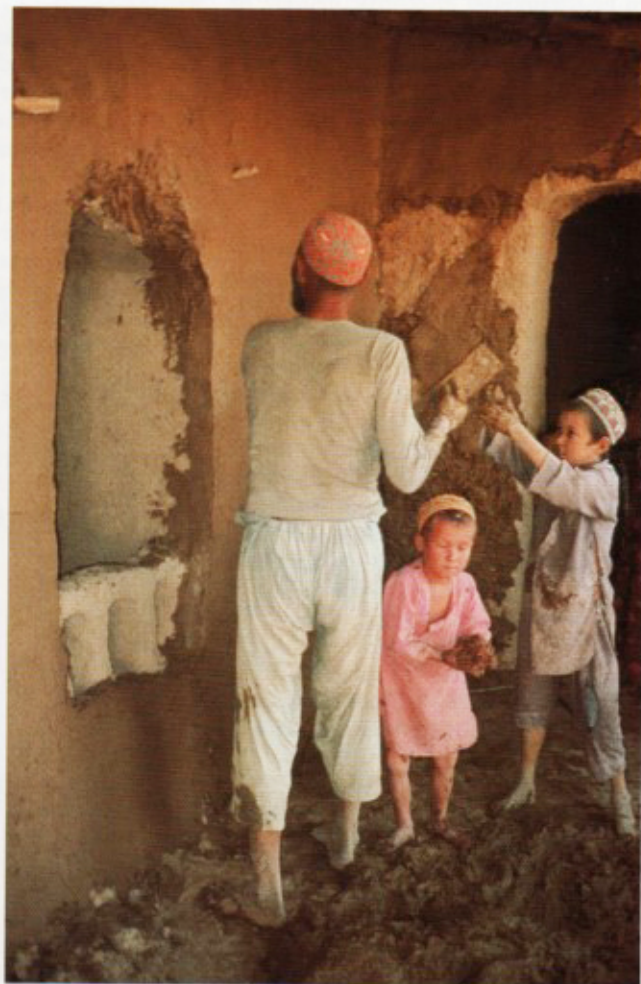
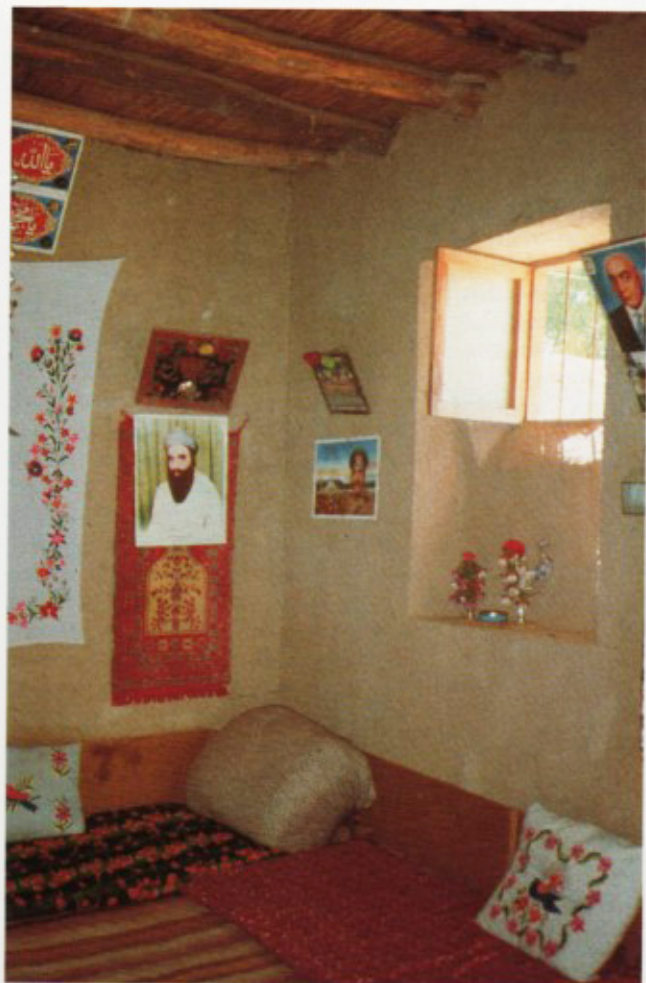
Dost Muhamad and his family fled from their village, Dil Barchin in Balch province, after it was bombed eight years ago. Dil Barchin was composed of three smaller villages, one of which has been completely destroyed. All the houses are made of mud, and 50 per cent of these are covered with domes built by a skilled mason from a nearby village.

Before the revolution, masons used to charge 65 Afghanis to build a dome, and the labourers cost 40 Afghanis per day. There were two carpenters in the village, and a wooden roof beam cost about 120 Afghanis. After the revolution, as there was a lack of manpower and high inflation, the masons asked 4000 Afghanis and the labourers 600 Afghanis per day. Dost Muhamad has heard from across the border that people today find it is almost impossible to obtain timber and that it would cost at least 1000 Afghanis per tree.

Dost Muhamad's family settled in Badabera camp only a few years ago.



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Prior to this they were living in tents on the border but they moved when they heard that there was some assistance for refugees and that it was cheaper to live there. He and his family want to go back to Afghanistan as soon as possible – when there will be less risk of fighting – however, the men will go first in order to cultivate the land and rebuild the house; the rest of the family will join them if the harvest is good.

While there is a general trend towards the use of modern materials, especially in an urban context, the traditional materials and techniques used in some cities and in most rural areas meet the needs of the inhabitants perfectly. In addition to the destruction of buildings, the war in Afghanistan has caused a prolonged break in the transmittal of traditional techniques and contributed to the problem of already scarce forestry resources. There will very probably be an inadequate supply of timber within the country to permit reconstruction along traditional lines. In the short term, the consequence of this shortage will be a rise in the cost of wood, and in the longer term, an ecological disaster.

With regard to the reconstruction problem, the following issues would seem to be paramount: insecurity; damage to road infrastructure; inaccessibility of many areas; public facilities (schools, basic health units); loss of know-how (break in the traditional skills); level of skilled manpower; absence of resources prior to a first harvest; scarcity of wood; rising cost of materials; lack of tools; areas of regular seismic activity.

In the light of the problems identified during this survey, and the precarious economic situation of the country, a realistic approach to the reconstruction should inevitably emphasize the use of locally available materials. Any action in the field of low-cost housing should consider among possible solutions, the following priorities: rehabilitation of traditional housing; improvement of the quality and the durability of local materials; proposal of a compromise between *kacha* (mass clay and sun-baked bricks) and *pakka* construction.

The issue is not one of adopting a conservative attitude but rather to improve existing techniques in order to make them compatible within a radically altered context.

The Project

With headquarters in Peshawar, the Domestic Energy Saving Project (DESP), financed by the GTZ (German Co-operation), was created in 1984 to contribute to preserving the ecological

balance in the North West Frontier Province of Pakistan. The main target group of the Project, until now, has been the Afghan refugees, of which there are about 3 million in Pakistan, most of them are located in this province.

A Housing Programme was introduced in January 1987, to complete the DESP activities. This programme was initiated for two main reasons:

*Timber is used in large proportions for building traditional flat roofs (the most common typology in NWFP), which do not usually last more than two or three years as a result of woodworm and termite attack.

*Many refugees were still living in precarious conditions without any chance of attaining minimum comfort.

It seemed vital to limit or to suppress altogether the use of wood in the building process, and at the same time provide a prompt and economical answer to the pressing need of housing for the Afghan refugees. Recourse to a traditional building technique from Afghanistan itself called *gumbad* made it possible to reconcile those objectives.

The present "gumbad house" construction has evolved because of requests for assistance from the Housing Programme. The purpose is not to provide a "ready made" house to refugees but rather to assist them in building "non-timber" roofs on a self-help basis. The technician or the mason advises the home builder about the dimensions of the rooms and the choice of the mud to use in brick making. When the building of the walls has been completed by the owner, a team of masons (one master mason and one or two apprentices) make the dome, their wages being paid by the Project.

After two years of effort and the construction of 256 domes, it was necessary to undertake an evaluation of the project in order to verify whether the techniques were appropriate, to suggest improvements and to consider the implications of extending the project to the rebuilding of Afghanistan.

Traditional Techniques in Afghanistan

Traditionally, housing depends on the most easily available materials, those which also appear to be the most economical; *kacha* (mass clay and sun-baked bricks) houses are the common type to be found throughout Afghanistan. Bricks baked by local craftsmen in small kilns are used in urban surroundings. However, the prohibitive cost of cement, which is mainly made for export to the USSR, limits its use to public works and prestigious institutional buildings.

The type of building which is most

common on the plains utilises mud for the walls; in the mountainous valleys, mud is progressively replaced by stones bound with mud mortar. In the wooded regions – Nuristan and Paktia for example – constructions entirely of wood can be found locally. Several different techniques using earth are to be seen in Afghanistan. Mass clay and sun-baked bricks remain the most commonplace but wattle and daub (Nuristan) as well as pisé (multistoreyed houses in the Middle Panther Valley, Bazatak) also exist. In the western part of the country, some people cover their reed structures with mud. Generally, the foundations are made of stones (boulders with mud mortar). When stones are not available at all or cannot be afforded, flattened earth is used.

The flat, mud roof is one of two prevalent types of roofing in Afghanistan. Wooden beams support small pieces of wood covered with reeds or grass (in rare cases, wooden planks replace the branches and the mats); the top is made of flattened earth and protected with a straw mud mortar. Variations of this sometimes appear, as in the fortress houses of Paktia, for instance; two-storey buildings in the Pustun mountains, built with mud bricks and stone, and clinging to the slopes in the way of the pueblos of New Mexico (USA) have flat roofs covered with slate.

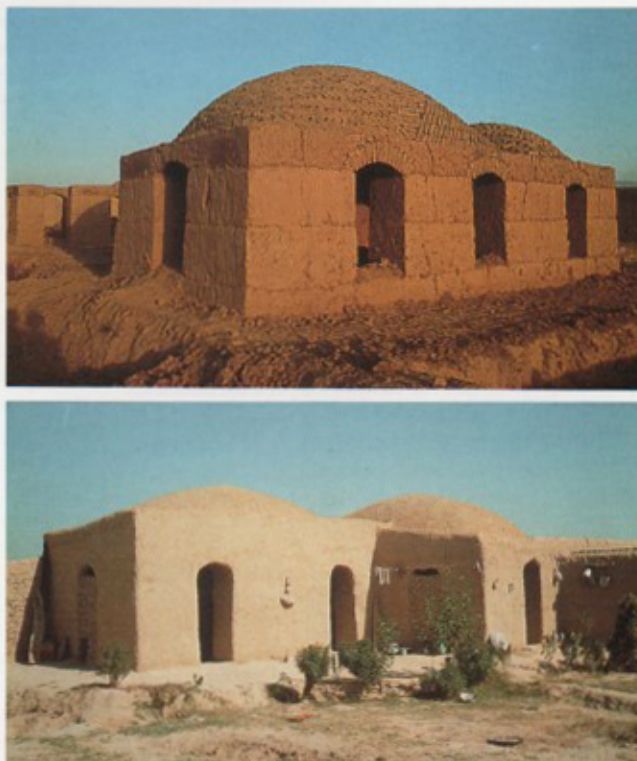
Apart from constituting a covering for the house, the flat roof also plays other roles in the daily life of people. It is commonly used for sleeping out of doors in summer, for drying fruits and vegetables, and as an auxiliary work space.

However, the vaulted roofs that one finds in the north, northwest, west and southwest regions of the country are made of sun-baked brick, but only rarely of burnt brick. The dome, which is the most common shape, is constructed in a variety of ways: domes on a square plan in the west, on rectangular plan in the north, domes using pendentives near Ag Ghab (Jozjan), and *farsiwan* domes with a central hole for ventilation between Herat and Qala Yi Naw (Badghis).

Vaulting techniques are much less widely used and appear especially in the southwest, between Iran and Pakistani Baluchistan, up to Qandahar province. They also exist in Mazar-i-Sharif region (Balch). Some regions even merge several techniques. In Yayar-i-Sharif for example, there are three-storey houses with the first floor covered by a vault and the two others by domes. In Gazni, two-storey houses present a flat roof but the first storey is often built with a dome.

The study of the maps gives a better impression of the demarcation of zones of

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vaulted roofs and presents the following characteristics:

- *low or medium altitudes: generally from 0 to 1000 metres and not over 2000 metres;
- *low rainfalls: from 0 to 400 mm/year;
- *recent geological formations;
- *negligible to minor seismic risks, with a few moderate risk zones.

The vaulted roof distribution probably reflects the best balance between the people's needs and the solutions they can find; however, it does not mean that this type of roofing may not exist elsewhere, nor that the adopted solutions do not raise any problem.

Know-how

Few full-time specialists live in a village, though now in the western part and especially in the cities, most people are professionals or technicians. The Afghan villagers are primarily farmers but a few are also craftsmen. Apart from their agricultural occupation, they are carpenters, masons, brickmakers, shoemakers, butchers, and *mullah*.

"Occasionally, regional part-time specialists, seasonally travel from area to area during the "non-agricultural" season. The Andar Pushtun for example, are experts in constructing and repairing the *qanat* in winter; some Wardak Pushtun travel to eastern Afghanistan to construct *qal'ah* (fortress-residences with watch-towers)..."

(LOUIS DUPRÉE, *Afghanistan*)

Above: Recently completed houses in Jalozay camp, having mud-brick domes, provide solid, insect-free shelter.

Improved Technologies

The use of improved local materials can entail numerous advantages: use of a minimum of energy for transformation of materials; diminution of imports; reduction of transportation costs; low capital investment; increased employment; contribution to rural industrialization; increases in land values; ecologically suitable and recyclable materials;

Below: In Swabi camp, a mason puts the finishing touches on the 'belt' of bricks around the base of a newly-built dome.



climatically-adapted resources; respect for the site and for cultural identity; enhancement of technical expertise.

A policy which stresses the use of improved local materials, and the introduction of *new* techniques, should necessarily take into consideration both their acceptability and the problems involved in training people in their use. As a matter of fact, the difficulties met by the DESP constitute a good example of these very problems.

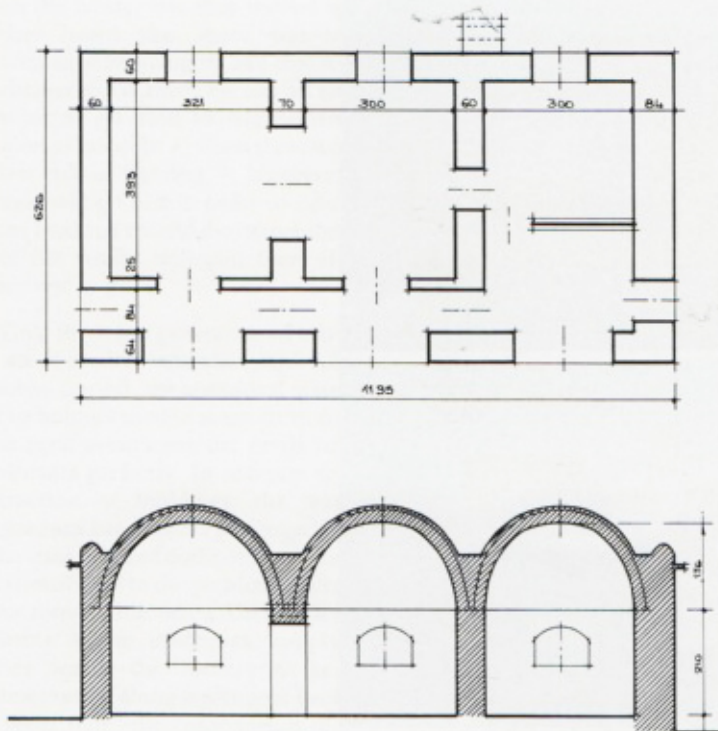
Acceptability

Since it was initiated the Project aimed at promoting construction of *gumbada* as widely as possible, but the actual occurrence of the domes built in the camps clearly shows that only some groups, coming from regions where this traditional typology already exists, have chosen to live in *gumbad* houses.

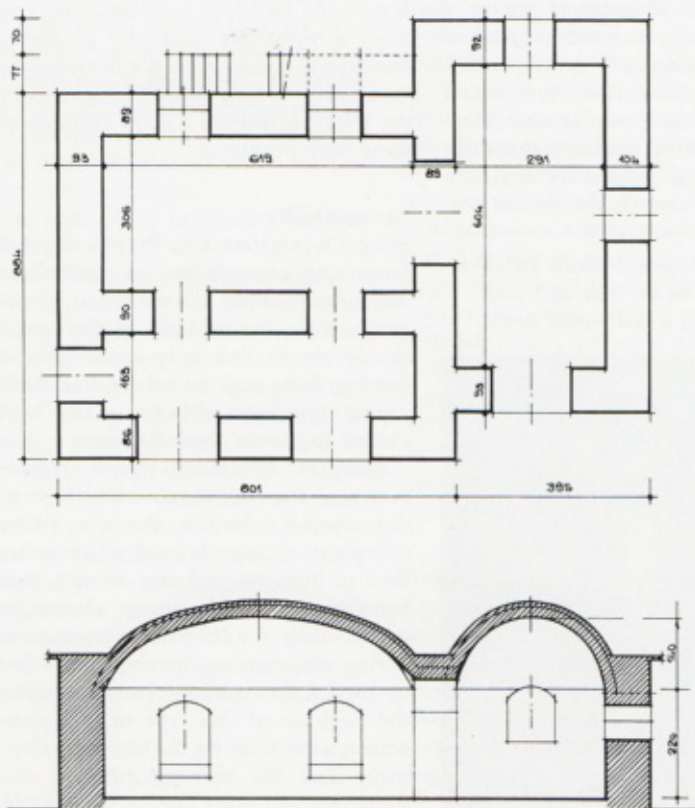
Refugees, like many people in precarious economic situations who have an opportunity to build at low cost, prefer to replicate their traditional habitat rather than to innovate and save money, thus benefitting from the many advantages explained by the Project representatives during information meetings. This has meant that the social acceptability among the Afghans of this type of roof constitutes a handicap for the future development and the dissemination of this technique and must not be overlooked. Apart from simple habit and local custom, a flat roof is functional also since it can be utilized as a working or sleeping area. In addition, its greater cost to produce than a mud-brick dome and its resemb-

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Plan and section of a local bakery built by the refugees in Badabera camp and benefitting from improved techniques.



Plan and section of a bakery constructed in Jalozay camp by Afghan refugees.



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lance to other types of 'modern' flat roofs, involve greater social prestige for the home owner. These factors, compounded by the fear of living under a vault that 'holds up by itself', contribute to many Afghans' rejection of the proposed system.

It is nonetheless important to realise that there have been cases where existing prejudices have evolved, depending on the context. In the Swabi camp, seven families, fed up with having to renew their flat roof (destroyed by insects) every two years, decided in favour of domes, although this technique is not at all traditional in their village.

Training

Traditionally, knowledge is communicated from father to son, but some techniques already devalued by competition with Western technologies have suffered additionally from the war in Afghanistan; the situation has not been favourable to a continuation of apprenticeship practices. The desire to promote these 'non-timber-consuming' technologies has led the project leaders to include training as a vital component of the Housing Programme.

The training proposed is exclusively practical: the trainee is entrusted to a skilled mason who is in charge of teaching him all the stages of construction of a dome until the trainee is able to build one by himself. This kind of innovation

upon traditional apprenticeship has some disadvantages:

- *It relies on the mason's own qualifications and his ability to teach others (qualities which are difficult to evaluate in field work)
- *Dome construction techniques in Afghanistan are the result of time-honoured craftsmanship, with no technical criteria but the requirement of years of practice to master
- *The segregation of tasks is a common practice on site in Pakistan as well as in Afghanistan: the man who uses a shovel for example, does not touch a wheelbarrow, so an apprentice is sometimes obliged to do repetitive jobs for long periods
- *The masons do not willingly transmit their craftsmanship; this reluctance is justified by the fact that they obtain social prestige because of their knowledge and to share it immediately would amount to diminishing their social status
- *Learning in a real construction situation does not make the training easier, because mistakes during the building process of a dome can lead to its collapse. Therefore the apprentice does not get the opportunity of building by himself until months of training have elapsed
- *However complicated traditional

expertise may be, it is often limited to a specific context, and this is the case for *gumbad* construction. The mason's knowledge remains limited to past experience, and he does not have sufficient technical background to be able to adapt his knowledge.

Taking into consideration all of these components which were analyzed during the project survey, the GTZ and Acroterre decided to establish a Mason Training Centre in January 1990 which, beyond its demonstration role, will train masons and other professionals in building techniques with improved local materials. Moreover it will undertake experiments aimed at improving these techniques (applied research) and determining other low-cost alternatives.

Depending on the political and military situation inside Afghanistan, this programme will, one hopes, assist in the construction of basic infrastructures like hospitals and schools as well as housing in the rebuilding of the society. M

Below left: In Peshawar, Afghan masons were trained in improved brick-making techniques, including stabilisation of earth with bitumin and use of presses.

Below: Masons and their assistants are here finishing the vaulted roof of a house in Badabera camp in Pakistan. Afghan masons train their compatriots in improved techniques.

