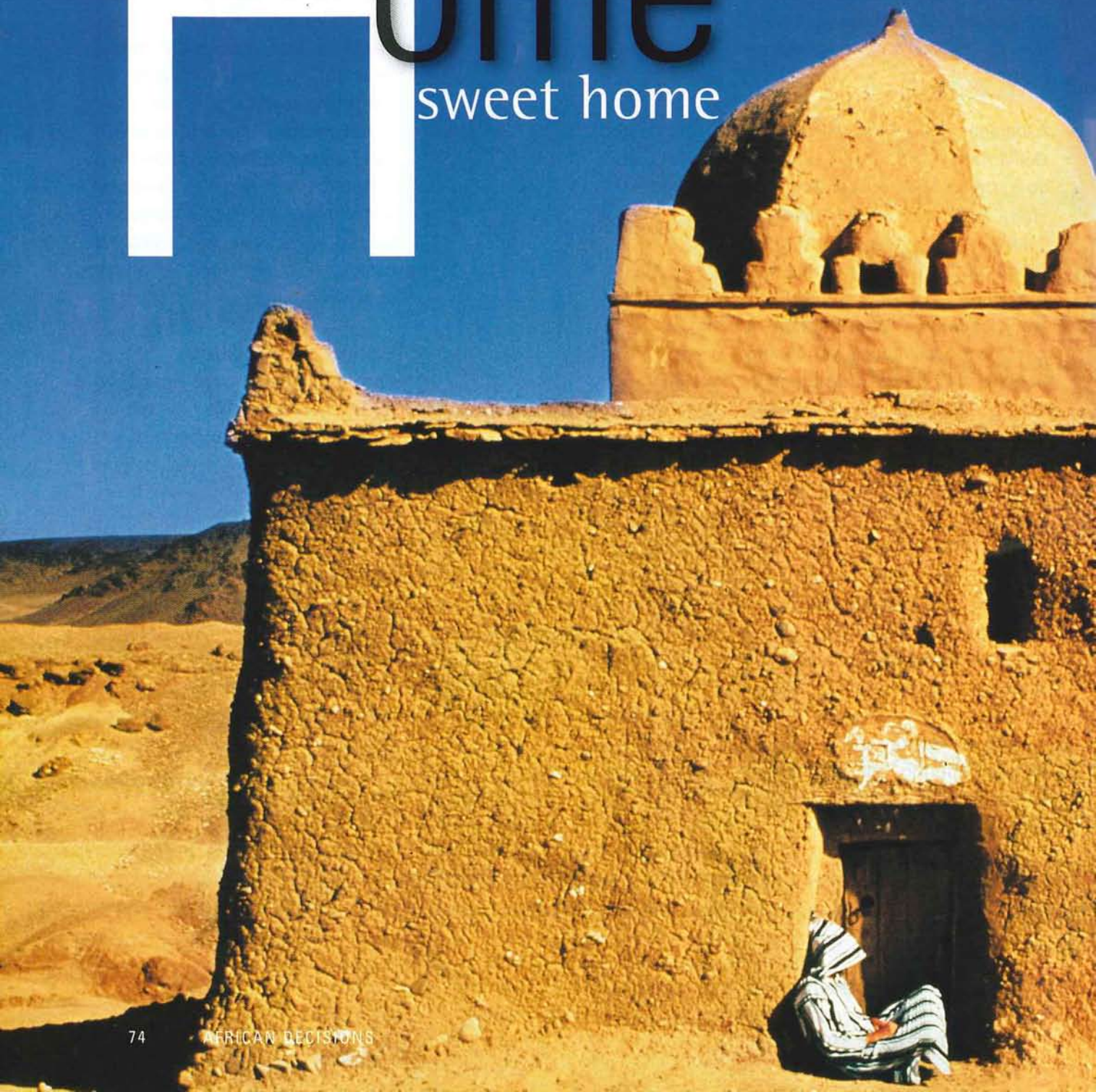


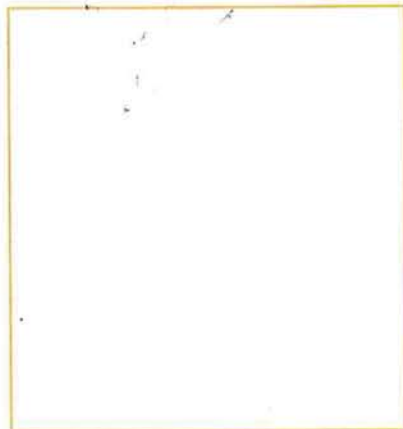
HOUSING

# Home

sweet home

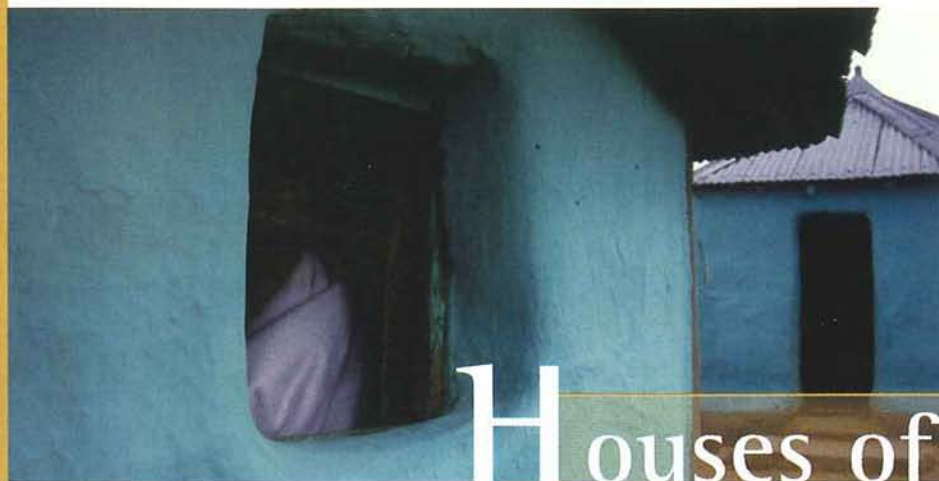


In the quest for innovative housing solutions, Africans should seek their own combinations of traditional methods, modern industry and appropriate technology. By **TELFORD VICE.**



Main photo: This traditional mud house in Morocco is well insulated against the fierce heat.  
Above: A modern house of rock and straw combines ancient and new technologies.

GALLOIMAGES/GETTYIMAGES.COM



Left: Brightly painted huts combine traditional mud-brick walls with corrugated iron roofs. Below: Stages of construction of a modern strawbale house by Eco design.

## Houses of STRAW

Shelter is among the most basic of human rights, along with food and clothing. But just as there are no free lunches, so all houses must be paid for. Innovation has long been a feature of building methods used on our continent. Most of these methods use indigenous materials and some of these materials are freely available from the surrounding environment. In urban areas, waste is often recycled into housing in informal settlements. One initiative in Lesotho, Can Products, turns recycled tin cans into homes and even furniture. In Kenya, pozzolanic cement – an alternative to expensive and sporadically available Portland cement – is manufactured using rice-husk ash.

Paul Mikula, a South African-based architect with a track record for producing housing for the masses, told *African Decisions* that in rural areas people make use of materials such as grass, palms and sand. 'Communities are incredibly imaginative when it comes to putting available materials to use in building their homes. The problems start in the city. When you move there, you've given up on all that. You're in a different economy and it requires a different building style.'

'Closer to the cities, the building material seen most often is scrap and people are doing wonderful things with scrap,' he added.

The developed world offers research into new materials and building methods. Italian company Vortex Hydra has developed a formula from which roof tiles can be produced more economically out of concrete. Much thought has also gone into providing

The advantage of straw-bale houses is that they are inexpensive as they're made from the waste after grains such as wheat, rice, barley and oats are harvested. Tightly compressed into rectangular bales tied with wires or polypropylene string, they are stacked and reinforced to provide structural walls that carry the roof. Alternatively, a frame of wood, metal or masonry can be used to support the roof, with bales filling in around windows and doors. When plastered with a straw/clay mixture, they make attractive, well-insulated homes that are also fire resistant. A good roof with generous overhangs is used to protect the walls.

These structures have become popular with environmentalists in the West over the last couple of decades. In South Africa, builders such as Mark Coetzee-Andrews – who is running a workshop at the Enabling Frameworks for Sustainability conference at Pretoria University in June – are successfully constructing them in urban areas in South Africa.

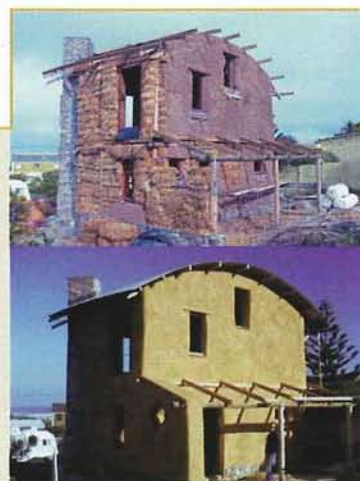
'One must use materials appropriate to each place,' says Cape Town architect Paul Andrews. 'You can't always look for industrial solutions.'

## See

[www.buildinggreen.com/features/straw/straw.cfm](http://www.buildinggreen.com/features/straw/straw.cfm)

[www.sustainablesettlement.co.za](http://www.sustainablesettlement.co.za)

[www.thelaststraw.org](http://www.thelaststraw.org), [www.builderswithoutborders.org](http://www.builderswithoutborders.org)



settlements with electricity, water, telephones and sanitation. Solar power, wireless technology and chemical applications are the buzzwords in this field.

Other forms of innovation are employed by organisations such as Habitat for Humanity, which draws 60 percent of its funding from the United States and raises much of the rest via micro-finance. Habitat builds 20 000 houses around the world every year at a cost of between US\$2 800 and US\$5 800 and is active in

27 countries in Africa and Middle East. The developed world also shares expertise. A group of Worcester Polytechnic Institute (WPI) students from the United States travelled to the village of Goreangab in Namibia to help shack-dwellers improve their homes. They spent two months working on cost-effective houses using readily available materials. Insulation in all weather conditions was needed as the corrugated iron and compacted oil drums the locals used to build their homes led to extreme indoor

SASA KRAL/TRACE IMAGES/ECO DESIGN



Above: A modern Eco design house uses bags filled with sand forming strong, sturdy walls.

## 'Communities are incredibly imaginative when it comes to putting available materials to use in building their homes'

temperatures. The solution was found growing in clumps around the village – reed cane, which was woven into mats and used to support other insulation materials between ceilings and roofs. Despite interventions like these, the overwhelming majority of Africans remain responsible for housing themselves. Hollow blocks manufactured from cement and gravel are more cost effective than the smaller, solid fired bricks, but still need to be purchased. Today there is a renewed interest in the good old-fashioned soil brick, thanks to better technology for producing a stabilised soil brick that has improved its strength.

However, the low-down on roofs is less uplifting. According to engineer Leonardo Nhanala, a consultant with the United Nations Industrial Development Organisation, 'In Africa the big problem in the housing field is the roofing and, as the clay tiles are expensive because the production process is long and the firing phase is necessary, the solution is using thatch or sheet-iron tiles.' However, he says the disadvantages are that thatch is not durable and must often be replaced, and that sheet-iron tiles are very hot during the summer.

So there is significant interest in the cheaper and more efficient production of roof tiles from a mixture of sisal and cement.

All of which costs money. The more developed economies in Africa have established programmes to channel funds to aspirant homebuilders, but some function better than others. In South Africa, between five million and 7,7 million South Africans called a shack home when Nelson Mandela became president in 1994. Officially the housing backlog was between 1,4 million and three million units, reported the *Mail & Guardian*. As much as 60 percent of the population did not know the luxury of electricity, while 22 million people were without proper sanitation and 16 million had no access to

clean water. A mere 10 years later 1,6 million houses had been built specifically for those who would not have been able to afford them otherwise. Some 1,9 million housing subsidies had been provided, only 27 percent of houses were still without access to sanitation and 70 percent of homes glowed with electric light. In the first 10 years of democracy in South Africa, R45bn worth of houses were transferred to those who needed them most.

Impressive though these figures are, the United States Agency for International Development (USAID) had its reservations. 'This achievement is dramatic, yet the typical low-cost houses are simple shelters of 30m<sup>2</sup> covered by corrugated zinc roofs, without insulation in the walls or ceilings, no suspended ceilings, and windows are not oriented to sunlight,' USAID said in its report, 'Housing with a Difference in South Africa'.

'Residents often find these houses scorching in summer and freezing in winter. To combat the cold, occupants generally pay high fuel costs in winter to heat their homes with coal or kerosene. The resulting poor indoor air quality threatens family health; children are particularly vulnerable. The incidence of accidents and fire are high.'

Mikula has his own ideas on the shape low-cost housing should take in Africa. 'We've got to go back to very high density housing, community housing which will revitalise our communities and put people within reach of amenities such as crèches and soccer fields without them having to travel significant distances.'

### ECOVILLAGE SOLUTION

The Tlholego Building System (TBS) is a flexible, owner-built, low-cost, high-quality housing system which simultaneously addresses environmental and resource problems.

Developed at the Tlholego Ecovillage near Rustenburg in South Africa, it uses modern techniques of sun-baked mudbrick, passive solar design, appropriate technologies for rainwater collection, compost toilets, grey-water irrigation and solar water heating.

Since Tlholego was established in 1991, it has focused on transferring skills in this innovative building technology. In 2000, the National Department of Housing selected Tlholego as the most appropriate model to represent South Africa at the Solutions Towards Sustainable Development conference in Pretoria.

For details of training courses, see [www.sustainable-futures.com](http://www.sustainable-futures.com) or phone +27 (14) 592-7090.