

# Kanga-roofed village for kids

David Sparkes shows us around Kesho Leo, a new village for orphans and widows built by the team at foodwatershelter.

**H**ave you ever wondered why we strive for sustainability? We talk about it a lot. You're reading about it right now. But why? Is it all about science? Or is it about something much simpler? Perhaps, apart from the undeniable logic of sustainable living, we believe that the happiness of any human being is inextricably affected by the ability to live in connection with their own environment. This is the belief of the team at foodwatershelter (FWS), who have been working hard to create an eco-friendly children's village to improve the lives of disadvantaged children in Tanzania.

Their remarkable achievement is nearing completion and, of course, environmentally-friendly living is just one part of this inspiring story. It all began in 2003 when five young Australian women were all working separately as volunteers in the village of Arusha, in northern Tanzania.

"We naturally gravitated toward each other being fellow Australians and having similar ideas about life and the world around us," recounts Kelsey Wilson, FWS vice-president. "After these volunteering experiences ended we returned home and it was at the end of 2005 that we all reunited for Anne's birthday in Sydney. Beck (Rebecka Darling-Darren, FWS president) and I realised we had both been trying to contact each other. She had actually taken the plunge and registered foodwatershelter. So there and then at Anne's birthday we all jumped in and started allocating jobs, we have never stopped since."

They decided their first project would be Kesho Leo, a children's village in northern Tanzania. Kesho Leo is Swahili



The roof at Kesho Leo is made of triangular tubes.

for 'tomorrow today'. The project is grounded in the belief that every human has the right to certain basic needs and FWS has laid down a blueprint to realise these needs.

Under the Kesho Leo plan, five children (mostly orphans) will be allocated to one 'mama', a local woman who has been widowed or abandoned by her husband. Kesho Leo will provide these women and children with safe shelter, nourishing meals, access to clean water, access to health facilities (including AIDS care) and education.

As if that doesn't sound like a big enough undertaking, FWS also wants to do all of this with next-to-no impact on the environment.

## Self-development

Academic development is a big priority and the kids participate in activities such as bilingual education and e-learning.

But within Kesho Leo's grand vision, social education is just as important and they are striving to ensure the children grow up in touch with Tanzanian culture. As Robert Cork tells me, this is where the sustainable farming plots at Kesho Leo begin to interweave with the development of the children.

"Part of making sure that our children grow up with a sense of being Tanzanian is having access to agriculture," he says. "We're talking about a country here where about eighty per cent of the population are agriculture-based."

Robert (better known as 'Corky') is the environmental advisor for FWS. He has done much of the planning for the project's sustainable features and he says that while those features will provide pragmatic benefits, it will also serve to provide life-skills and continue the cultural connection with the land. The kids will tend the livestock, harvest the crops

and perform all the other tasks within the agricultural traditions that are integral to their own culture. In short, FWS wanted a garden where every element provided the chance to learn.

## Sustainability

Kesho Leo village reads like a smorgasbord of sustainable features. All aspects of environmental impact have been tackled and it is difficult to know where to start.

## The design

The village is designed by Robert Watson, a Melbourne-based architect with a passion for sustainability techniques.

To suit the long narrow block, Robert opted for a series of three buildings (total area 1260m<sup>2</sup>) that are connected by raised walkways (pretty handy in the wet season!) He says that efficient use of materials was a big factor for financial reasons and the buildings needed to be as self-sustaining as possible.

In keeping with sustainable design principles for the tropics, the buildings are raised to allow passive cooling in the hot season. The narrowness of the buildings encourages cross ventilation from the prevailing winds.

North/south facades have been maximised to allow passive heating when the sun is lower in the cool season, but are adequately shaded by eaves from the higher sun during the hot season. Conversely, the east/west facades have been minimised so that during the hot season, the morning/evening sun does not have much surface to heat.

## The Kanga roof

The most striking feature of the design is the 'Kanga' roof. Rob Watson tells me the name 'Kanga' was chosen because, with its zigzagging look, the design resembles a traditional African textile pattern, known as Kanga. The roof is made up of triangular tubes, on average about eight metres long and constructed from plywood. One by one, these triangular



Top: all hands on deck. Bottom: The buildings are raised to allow for passive cooling.

modules are constructed on the ground and then placed side by side on the roof. Purlins are then placed on top, followed by a galvanised iron roof.

In this design, Rob was aiming for "a heavily insulated area with good structural integrity and a large void between the ceiling and the roof. Each inverted triangular structure is in one hit a giant air tube."

The triangular shape/size of the mod-

ules is based on the plywood sheets used for the project; "It's about the best use of materials. Those sixty (degree triangles) are based on an uncut sheet of plywood (which are 1355mm wide). So we are really trying to minimise waste."

## Energy

The village requires very little electricity, just a few lights for night time classes and a refrigerator for medical supplies.



A 35kW photovoltaic system is planned, which should be up and running this year depending on funding. Rob Watson says there is also some potential for windpower on site.

## Biogas

For cooking, an impressive bio-digester has been constructed to produce methane from livestock manure. "It's just getting filled up at the moment," says Corky. "We've got to bring in some truckloads of manure to fill it and once it's up and running it will only need about a wheelbarrow of manure per day to produce enough gas for fifty residents for cooking."

## Rainwater catchment

The rainwater collection system has a jaw-dropping capacity of 100,000 litres (made up of 5000 litre poly tanks.) It will collect 280,000 litres per year based on the average yearly rainfall of 200mm. The tanks are dug in beneath the buildings to minimise evaporation and land use. This system also aims to produce enough excess clean water to distribute to some nearby residents.

## Experimental aquifer

A revolutionary underground aquifer design is being trialled for agriculture use in the dry season.

"The aquifer is nearing completion.

Left: Old truck tyres for a trial aquifer. Right: The rainwater tanks are dug in beneath the buildings, with a total capacity of 100,000 litres.

It's an experimental system designed by an Australian company called Ecoflex. As far as we know it's never been done anywhere in the world," says Corky.

The design uses old truck tyres to form an underground 'tank'. If successful it will have a capacity of about 85,000 litres.

## Composting toilets

Composting toilets have been set up at the volunteers' village (away from the main village) and are planned for the main complex. Three slightly different designs are being used to suit each location. Apparently when the first batch of fertiliser was taken out, a small crowd of sceptical locals were suitably impressed!

## The eco-garden of Eden

They say that East Africa is the birthplace of humanity; this belief may well be verified by Kesho Leo's very own Garden of Eden. The team wanted a permaculture garden that provides for the physical needs of the village and also enhances

the social and educational development of the children. A permaculture specialist, Eve Archbold, has been at Kesho Leo since August 2008 and she now manages the farm alongside Samuel Kimaro, a Tanzanian farming expert.

"It's been interesting because at first there was quite a bit of scepticism (from the locals) at some of the ways that we grow things," Eve says. "In a lot of ways it's quite different to the way people tend to farm here. But people are always enthusiastic to see how it all ends up working. And then slowly we've been winning people over to a few different things we've been doing."

## Veggies

Kesho Leo has two separate three-acre blocks, one of which contains the village. The vegetable plots are on the same block as the main village complex and they seem to be producing more tucker than the farmers can handle! Intensively planted veggie garden beds are rotated and produce a wide range of vegetables to meet the nutritional needs

of residents all year round.

The other block, which has no buildings, has been dedicated to the production of staple crops. Inter-planted with corn are soya beans, cowpeas and lentils.

## Greywater

Foodwatershelter is budgeting for only twenty litres of water usage per person per day, so there will be relatively little greywater. What is produced will be filtered through a number of small systems around the village. For example, a conventional reed bed system which, rather than disposing of the water, will then use it to grow fodder for the livestock.

## One big cycle

As Corky tells me, the entire process is "a cyclical system where everything has multiple uses and everything is inter-dependent."

Greywater helps grow fodder for the livestock, which produce manure for the bio-digester. The bio-digester produces methane for cooking and the leftover slurry fertilises the veggie gardens. Excess slurry then runs off the gardens into the fish ponds. This promotes organic growth, providing feed for the fish. End result: everything produces something and everything helps something else.

## Almost there

What is even more extraordinary is that the project picked up again after the death of Darren Stratti in July last year. Darren was shot one night during a rob-

bery. He had been leading the building of the village, working in the remote location for twelve months and was only a few months off finishing the build.

After almost two years of building, dreaming and fundraising (more than \$400,000 so far) the FWS team can see light at the end of the tunnel. Only the finishing touches remain such as the solar panels, biogas system, kitchen fit-out and plumbing. The first group of vulnerable women and their children will move in mid-year and orphans will be moved in during the following months. Some of the aims are already realised; the Kesho Leo early learning centre opened in January this year, providing interactive, bilingual classes for sixty children from the project and neighbouring households. The community is abuzz as the locals become more and more enthusiastic.

The day that Kesho Leo's new residents move in will mark an incredible achievement by a dedicated group of volunteers. A group of disadvantaged children and women will be empowered with the abil-



ity to determine their own futures and to live within a healthy social environment enhanced by their connection with the land around them. \*

Foodwatershelter would like to thank all its sponsors, especially Planet Wheeler, who funded the permaculture and farming activities. For more details about the Kesho Leo project, or to make a donation, visit [www.foodwatershelter.org.au](http://www.foodwatershelter.org.au) To help buy specific items, such as solar panels, go to the shopping list on the FWS website.

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The advertisement features the word "solazone" in large, orange, lowercase letters. To the right, the text "for all things SOLAR" is written in a smaller, blue, sans-serif font. Below the text, there are several images: a house with solar panels on the roof, a swimming pool with people swimming, and a close-up of solar panels. At the bottom, contact information is provided: "Two shops: Qld (07) 5448 8304 and Vic (03) 9808 7337" and "Free online catalogue at [www.solazone.com.au](http://www.solazone.com.au)".