WORDS STUART ROTHGIESSER **PHOTOGRAPHS** TONY LEE

TRIAL AND TRIUMPH IN PARADISE

The first-ever ecologically conscious apartment complex in Mauritius was initially more than developer Tony Lee bargained on. He persevered and went on to widespread recognition and commercial success.

All is not well in paradise. Only forty days' worth of water supply is available for the whole of Mauritius at any given time. This is due to a lack of infrastructure (no dam has been built since independence) and the high demands of new developments and industries. And while there are usage restrictions, poorer people who do not have tanks are the ones facing the worst hardships of water cuts.

The beaches that made the island so famous are under threat, while erosion is occurring at an alarming rate – primarily due to the rising sea level and worsened by coastal developments.

There is also considerable pressure on energy usage on Mauritius. While the government is promoting and investing in renewable energy, 80% of all energy still comes from fossil fuels and another coal plant is being built. A proposal to build a waste-to-energy plant was recently rejected.

These concerns are exacerbated for this member of the Southern African Development Community through industrialisation and the rapid increase in tourist estates – in particular, golf estates and their heavy usage of water.

Ecosis, a consultancy that plans and designs environmentally conscious developments, was set up by Tony Lee in 2007 upon his return to his home country. He had spent 15 years as a quantity surveyor and project manager in South Africa. Besides designing and modelling, the company supplies turnkey sustainable technologies to which it owns the rights in South Africa and the Indian Ocean regions. These include natural pools, water treatment systems and extensive green roofs. Ecosis also provides assessors for environmental rating systems such as BREEAM (the Building Research Establishment Environmental Assessment Method). This is a voluntary measurement rating for green buildings established in the UK equivalent to the South African Green Building Council's Green Star.

DESIGN AND TECHNOLOGY

Residence Tanzi was Ecosis' first in-house project conceptualised from scratch. The design phase started mid-2007, while building began December 2008 and was completed in March 2010. Laetitia Lorre, Lee's wife and head of L3 Properties, recalls: "From the beginning, Tanzi was not only a residential project, but a project to respect and preserve the land and to make use of the benefits of the technologies and knowledge that Ecosis brought from overseas and introduce it to the local industry."

As the first ecologically aware large development on Mauritius, the Tanzi boasts a mixture of age-old and cutting edge green technologies, including passive cooling and natural ventilation. Underground sanitary voids create "pools" of cooler air that chill the ground floor slab. On warmer days, the induced convection currents drive the warm air upwards and outwards through strategically placed openings.

This thermo-siphon effect is boosted by a skylight and a silent, stainless steel wind-powered whirlybird, a system designed by Lee to assist with the movement of air. When needed, the warm inside air is

NUTSHELL

Location Grand Baie, Mauritius
Size of property 5300 m²
Gross built-up area 3350 m²
Energy use per annum 55000 kWh p.a
Project started mid 2007 (design)
Construction start date December 2008
Completed March 2010
Construction costs R26 million (excluding solar power installation)

constantly replaced with cool, fresh outside air creating cross ventilation breezes. The merciless Mauritian sun is held at bay by aerated paving blocks on the flat roof slabs (half blocks sold by local company Marbella), effectively cutting heat transmission to the interior of the building.

Dropped ceilings with insulated ceiling voids assist with decreasing heat. As a result, not a single air-conditioning unit is needed in the whole development – something virtually unheard of in the tropics. The indoor air quality is free from harmful volatile organic compounds, as the mineral paint from Keim contains no solvents.

OTHER ECO-FRIENDLY FEATURES

The Tanzi development includes a number of other environmentally responsible features:

- Electricity usage is limited by taking advantage of natural light ('daylighting' – taking into consideration the movement of the sun), and using LED lights, solar-powered lighting and solar water heaters.
- Rain water is collected in underground reservoirs to water the indigenous gardens and grey water is re-used for toilets to lower water consumption.
- BioNova natural pools use plant life to clean themselves without the use of harmful chemicals.
- Ecosis' decision to use the rocks from the excavations and the demolition wood from old colonial houses for the boundary and separation walls, is in line with the intent of reduced transportation emissions and the recycling of existing material.
- Walking and cycling is favoured as the development is within a 400m radius from all amenities, recreational facilities and the beach.

CONSTRUCTION CONUNDRUMS

While the design and conceptual phases went smoothly, major problems occurred in the building phase.

Lee says: "I became a builder by circumstance, rather than by choice. The appointed contractor had made a mistake in the setting out, which were overlooked by the consultants."

Incredibly, the first team of contractors set up the first two of the symmetrical buildings the wrong way round – with the balcony on the kitchen side and vice-versa. "No-one noticed and continued building until they built the basement. I questioned why the window was on a certain grid line, different from the plans. They investigated and realised that buildings were wrong way round." Only 10% of the existing columns and support structures could still be used: the rest of the foundations and basements of four units had to be demolished and rebuilt from scratch.

"The contractor copped out. As seasoned project

KEY FEATURES

- Location: within 400m radius of all amenities and recreational facilities
- Passive cooling through natural cross ventilation and induced convection current
- Solar water heaters
- Insulation using sanitary voids, insulated suspended ceilings and roof aerated paving blocks
- Sun shading and daylighting designed using computer models
- Ten natural swimming pools and two regeneration natural ponds
- LED lighting technology throughout
- Recycled building materials
- Use of on-site material such as rocks from excavations of foundations
- Rain water collection to underground tanks for irrigation and flushing of toilets
- Water-wise gardens with indigenous vegetation

manager, I took the site over with most of his subcontracted workforce."

Daily site meetings, including specific, clear deliverables, became the order of the day. Managing people and labour contracting became Lee's biggest task. And with labour contracting came disciplinary issues, but luckily none too serious.

Ecosis had to expand their consultancy to ensure they had all the requisite skills available, and Lee had to find ways to deal with some cultural differences between the approaches in Mauritius compared to those of South African sub-contractors and workers.

Other challenges included poor money management by subcontractors, some design issues with the architect and issues regarding timeous delivery of details and specifications with engineers.

There were surprisingly few red tape challenges for the Tanzi developers, but the waste water clearance did become a major issue.

"As a green project, we opted for an on-site treatment plant. We proposed a bio-disc system – a system that uses bacteria on a rotating disc to clean waste water to the levels required by legislation for dumping back into nature," explains Lee.

He says the proposed system reduces the load on municipal services and prevents blocked and smelly drains, while the water can be re-used for irrigation purposes after further treatment. Despite all the advantages, the waste water department was adamant that Tanzi had to connect with the sewer system.

90%
of the foundations and basements of the first two buildings had to be demolished and rebuilt after contractors set them up the wrong way round.

This entailed major expenses: with the closest connection being 250 metres away, the development needed to have a lifting station. "After the required excavation, pipe work and road restoration we discovered that the target manhole was not a sewer manhole, and the municipality forced us to connect to one 600 metres away even though we told them that it was completely out of our budget."

Lee believes this kind of situation poses an obstacle to innovation and new technologies. "If they want to use the same technologies, then nothing will change. There are controls in existence – we can test the water quality and send it to officials. There are checks and balances." Altogether, Ecosis lost 1.5 million rupees (approximately R 360 000) on the waste water issue, while some key relationships also suffered.

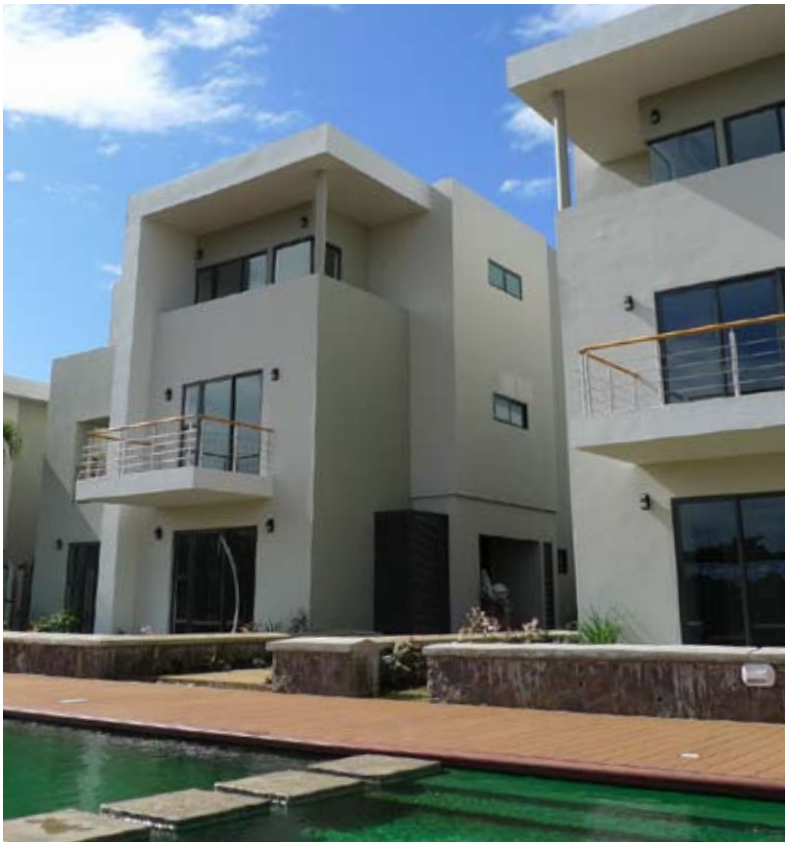
LESSONS LEARNT

Lee and Lorre say they have learnt much from being thrown in the deep end during the Tanzi project. One of the main lessons was to stick to a payment schedule – and not to allow 'catching up' on work. "The fibre glass lining subcontractor for the pools disappeared after being paid in advance!"

Gone, too, is the wide-eyed innocence of the naïve: "I lost a significant amount of money through trusting and believing in people, or giving in to people's stories." When asked for an example, though, Lee still shows his old softness: "Going

SOURCEBOOK

Residence Tanzi www.residencetanzi.com
L3 Properties www.l3properties.mu
Architects Architects Studio/Bunjun Architect/Daruty de Grand Pre Architects
Construction management Spritz Ltd www.spritzltd.net
Lighting (LED lighting) Opple www.opple-lighting.com
Flooring Cemtech/Louis Valentino www.cemtech.mu / www.lvwooden.com
Solar water heaters SolarStar
Green roof and landscaping Ecosis Ltd www.ecosisltd.com
Wood supplies Woodpecker Ltd and sourced from demolition sites
Aluminium frames Yekalon Industry www.yekalon.com
Flat roof slabs Marbella
Skylights Resiglass
Specialised glass/window suppliers Yekalon Industry www.yekalon.com
Special paints Bavarica Decorating and Coatings www.keimfarben.de
Rock sourced on property
Pools and ponds BioNova natural pools www.bionova.mu



for the contractor would have probably made him bankrupt... so I absorbed the loss."

Lorre, who grew up in Reunion, was also new to working in Mauritius. She says she learned not to lose time or sleep with property partners that were not as committed as they were, but to work instead with their own trusted team of people who were sourced internationally or recruited and trained locally.

Because of Tanzi, Lorre says she has become a committed environmentally conscious developer. "After a year, I am still not able to sell some other properties which are not well designed for a good and healthy way of living." She has completed the Green Star SA Accredited Professionals course and if possible wants to sell only 'green' properties in future.

She adds: "Tanzi has reminded me how normal it is to be and live green... even if we are not able to buy expensive technologies."

SUCCESS STORY

The Tanzi is a phenomenal success. Buyers made a 35% return on investment six months after hand-over in April 2010. Ecosis won the NPCC Gold Innovators Award Mauritius in 2008 for the first green residential development in Tanzi, the first gold given since the award was established. The company has also received two other local and international awards and nominations in various categories for their work in the fields of environment and sustainability. Clients of Tanzi brought two new projects in Mauritius to Ecosis – a hotel and a warehouse, both to be built using environmentally conscious designs.

Lorre says although the main selling point remained the investment potential of the property, prospective buyers reacted positively to the green features and at least two buyers were swayed by the green features. However, she cautions that "everybody knows about sustainability but in Mauritius this is not yet a common practice".

OTHER PROJECTS

Ecosis has completed the design and installation of green technologies in Nautica, an environmentally conscious shopping centre where green technologies include an extensive green roof and a bio-disc wastewater treatment plant. They are also working on a small hotel and another residential development, while acting as energy efficiency consultants to government. Ecosis plans to expand into South Africa and the Indian Ocean region, while maintaining a focus on sustainability.

Lorre concludes: "Business is not the only factor to consider – even in the property business. We have to think further – to take the triple bottom line approach."