



## SALAM CENTRE FOR CARDIAC SURGERY

Khartoum, Sudan

Before the cessation of South Sudan in 2011, Sudan was the largest country in Africa. Khartoum, the capital, is located in the central part, close to the confluence of the Blue and White Niles, with an estimated population of about five million (reputedly increased by a further three when the informal camps and settlements established in the city by refugees fleeing internal conflict are taken into account). Almost half have no access to water and more than half have no access to sanitation in a city that is one of the hottest in the world, with summer temperatures over 50 °C and very little rain even in the wet season. The area is also beset by frequent desert sandstorms that reduce visibility to zero and render the air unbreathable. The most recent figures of the Human Development Index – used to calculate an accepted broad definition of well-being in terms of health, education and income – rank Sudan just above war-torn countries such as Afghanistan, Liberia and Mali.

In 2004, Emergency – a small independent Italian NGO founded in 1994, acting primarily to provide free, high-quality medical and surgical treatment for victims of war, landmines and poverty – chose to bring its skills to the country: the Salam Centre for Cardiac Surgery was one of the projects it set up. With the help of the Sudanese government and especially the Ministry of Health, a plot of about 14,000 square metres on the east bank of the Blue Nile in Soba, a suburb 20 kilometres from Khartoum and once the Coptic capital of Sudan (AD 540–1604), was allocated for the construction of the new facility, which today offers free-of-charge treatment to people with congenital or acquired heart pathologies. Cardiovascular diseases, mainly deriving from rheumatic fever that is widespread in the region and that predominately affects children and adolescents, cause 10% of deaths in Sudan and neighbouring countries.

The inspiring words of Gino Strada, surgeon and founder of Emergency, informed the project from the start: “We want our hospital to be beautiful, ‘scandalously beautiful’, because that beauty becomes a token of respect towards people devastated by war or disease and a beautiful place offers the conditions essential to regaining dignity in suffering. For this reason, in all our hospitals the utmost importance is attached to children’s playrooms, social spaces and gardens. Treatment is not confined to operating theatres and wards only, but applied through care devoted to each person as an absolute human being.”

Essentially a “self-build” project managed by Emergency, the Salam Centre was designed and delivered by the team of Italian architects of studio

tamassociati working on a not-for-profit basis. Wherever possible, construction was contracted to local builders and suppliers, while the specialised medical equipment was gifted as charitable donations from international sources. The main buildings of the complex are the central, one-storey, highly technical hospital pavilion (three theatres, 63 beds, diagnostic wing), flanked by a guest house for relatives and smaller separate service buildings, the prayer and meditation pavilion, a solar panel facility, and the medical staff accommodation compound (sleeping 150), all set within a large well-kept garden and around large grassy, planted and shaded courtyards.

The main challenge for the architects was the intense heat. The orientation of the plot was exploited to combat this, extensive use was made of large shade trees in the outdoor areas, and linking paths were screened with traditional panels of intertwined vegetable fibres, while a double-shell system for walls and roofs was devised to keep the buildings cool. This resulted in a “box within a box” structure for the hospital block, with a large void above the ceiling protected by an insulated metal outer skin, while 60-centimetre-thick cavity walls with insulated panels were made from locally fired bricks, providing an effective low-tech thermal barrier. All windows are sunscreen coated and double glazed. Air conditioners powered by a barrage of solar panels circulate the 28,000 cubic metres of cold air needed every hour and help maintain constant satisfactory indoor temperatures. A “sand trap” in the basement sucks in dust-laden sandstorm air, removes the sand and passes the clean, cooler air into the ventilation system. Water is obtained from deep aquifer wells pumped into a cleansing system and power is supplied by the grid, although back-up generators are on hand. Self-sufficiency and sustainability are, indeed, hallmarks of this state-of-the-art hospital’s design, coupled of course with “beauty”, all tailored to the human dimension, making it a welcoming yet highly efficient, holistic, multi-faith environment, with natural light, views outside, clear layout and signage, cheerful colours and greenery.

Recycling also plays a major role, most clearly demonstrated in the reuse of 95 six-metre containers as residential units and communal areas in the staff compound. Each unit – again insulated by a double-shell system plus bamboo brise-soleil panels – contains a bathroom and small veranda onto the garden and was made from one and a half containers set against each other around two planted courtyards. The prayer and meditation pavilion was sensitively designed to be a peaceful space welcoming all religions: two interconnected cubic volumes on shallow water.

The Salam Centre has had a tremendous impact, treating significant numbers of patients not only from Sudan and its neighbours, but from a good 23 other countries as well. In addition, people come to train here and, most importantly, its example and vision have encouraged the establishment of further medical centres of excellence in other African countries.



## JURY CITATION

The Salam Centre for Cardiac Surgery champions the vision and resilience of all involved in delivering a responsible, efficient and inspiring model of health services in a society marred by war, internal conflict and lack of basic needs like water and sanitation.

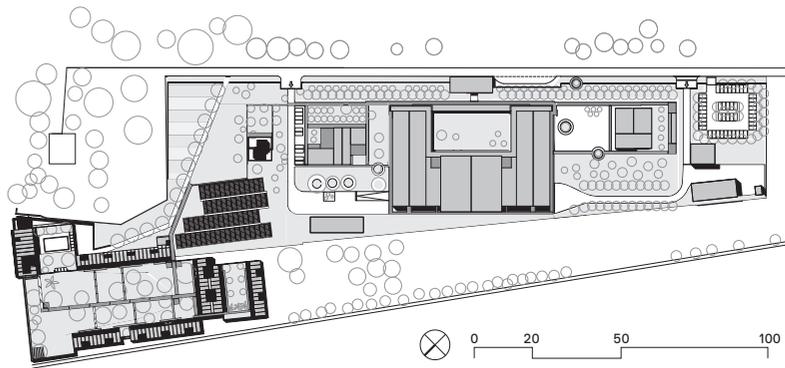
Intimately linked to surrounding nature, the “self-build” project facilitates an environment of clarity and healing, while providing the fundamental human right of health, free of charge to all. Following a bottom-up design process, this complex project evolved successfully by creatively engaging all its local, political, social, topographical and aesthetic specificities without sacrificing its vision for excellence and function. The compact state-of-the-art hospital also provides an exemplary prototype for the region as well as for the field.











## SALAM CENTRE FOR CARDIAC SURGERY

Khartoum, Sudan

### CLIENT

Emergency, Milan, Italy:  
Gino Strada, founder

### TOTAL SITE AREA

40,000 m<sup>2</sup>

### HOSPITAL BLOCK

#### ARCHITECT

Studio Tamassociati, Venice, Italy:  
Raul Pantaleo, Massimo Lepore, Simone Sfriso  
design team with Sebastiano Crescini  
Pietro Parrino, project manager and programme  
coordinator  
Rossella Miccio, programme coordinator  
Francesco Steffinlongo, structural engineer  
Studio Pasquini, Jean Paul Riviere with Nicola  
Zoppi, mechanical/services engineer  
Franco Binetti, operating theatre design  
Roberto Crestan with Alessandro Giacomello,  
site engineer  
Gino Strada, Emiliano Cinelli, Fabrizio Fasano,  
Andrea Cioffi, feasibility project

#### PROJECT DATA

Built area: 21,500 m<sup>2</sup>  
Cost: 18,452,000 USD  
Commission: December 2004  
Design: December 2004–May 2007  
Construction: January 2005–May 2007  
Occupancy: May 2007

#### MEDICAL STAFF ACCOMMODATION COMPOUND

#### ARCHITECT

Studio Tamassociati, Venice, Italy:  
Raul Pantaleo, Massimo Lepore, Simone Sfriso,  
design team  
Pietro Parrino, programme coordinator  
Francesco Steffinlongo, structural engineer  
Nicola Zoppi, mechanical/services engineer  
Roberto Crestan, Alessandro Tamai, Claudio  
Gatti, site engineers

### PROJECT DATA

Built area: 2400 m<sup>2</sup>  
Cost: 1,367,000 USD  
Commission: March 2006  
Design: March 2006  
Construction: December 2007–February 2009  
Occupancy: February 2009

### EMERGENCY

Emergency is an Italian NGO founded in 1994  
by the Italian surgeon, Dr Gino Strada, to  
provide assistance to civilian victims of war.  
From 1994, Emergency has worked in 16  
countries, building hospitals, surgical centres,  
rehabilitation centres, paediatric clinics,  
first-aid posts, primary health clinics and a  
maternity centre, as well as the Centre  
for Cardiac Surgery in Khartoum. Subsequent  
to requests from local authorities and other  
organisations, Emergency has also helped to  
renovate and equip pre-existing health facilities.  
Since 1994, Emergency teams have provided  
assistance to 5,439,757 people (as of 31 March  
2013).

### STUDIO TAMASSOCIATI

Studio Tamassociati is a professional practice  
active in the fields of sustainable architecture,  
urban planning, landscape design, participatory  
processes, graphic design and social commu-  
nications. It comprises an Italian team of archi-  
tects based in Venice since 1996 and it is known  
worldwide for health-care works carried out  
on the African continent.

In 2012, the project was awarded the Honourable  
Mention in the category "Architecture  
for Emergency" at the Gold Medal for Italian  
Architecture Prize, Triennale of Milan, Italy,  
following other international awards such as  
"Best of Green Awards" 2010 (USA) and  
"Middle East Architect Awards" 2010 (Dubai).  
Main recent exhibitions include "2012 Triennale  
of Architecture", Milan, Italy, and exhibitions  
and lectures at the "International Biennale  
of Architecture" in 2010 and 2012, Venice, Italy.

### WEBSITES

[www.salamcentre.emergency.it](http://www.salamcentre.emergency.it)  
[www.emergency.it](http://www.emergency.it)  
[www.tamassociati.org](http://www.tamassociati.org)

