

korak za korakom: trajnostna gradnja za afriko

step by step: sustainable buildings for africa

Fotografije: arhiv arhitekta / Photos: architect's archive



Foto: Andraž Kavčič

Diébédo Francis Kéré je arhitekt, doma iz Burkine Faso, po študiju v Nemčiji pa je ostal v Berlinu, kjer ima svoj biro. Njegovo delo je motivirano z idejo, da v Afriki, predvsem v svojem rojstnem kraju, promovira sodobno in trajnostno arhitekturo. Že v času študija je s prijatelji ustanovil zavod »Schulbausteine für Gando«, ki oblikuje trajnostne stavbe in podpira razvoj lokalnih skupnosti, od Afrike pa do Indije. Od leta 2004 uči na Tehnični univerzi v Berlinu, o arhitekturi in urbanizmu, predvsem o klimatsko naprednih stavbah, trajnosti uporabi materialov, integraciji lokalnega dela in lokalnih konstrukcijskih tehnik predava po celem svetu. Francis Kéré je eden izmed petih arhitektov, ki so nominirani za nagrado »Global Award for Sustainable Architecture 2009.«

**diébédo francis
kéré**



uvodnik
esej
predstavitev
intervju
natečaj
kritika
pogovor
predavanje
prevodi

Diébédo Francis Kéré is an architect from Burkina Faso. After studying in Germany, he made his home and his office in Berlin. His work is motivated by the idea of promoting contemporary and sustainable architecture in Africa, particularly in his hometown. Already as a student, he set up foundation "Schulbausteine für Gando", which designs sustainable buildings and supports the development of local communities worldwide, from Africa to India. Since 2004, he has taught at Technical University of Berlin, and has been all over the world lecturing on architecture and urbanism, particularly about advanced climate solutions in buildings, sustainable use of materials, and the integration of local labour and local construction techniques. Francis Kéré is one of the five architects nominated for the 2009 Global Award for Sustainable Architecture.



Osnovna šola v vasi Gando, 2001, pogled s sprednje strani.
Elementary School in Gando, 2001, front view.

Za arhitekta Francis Kéréja in njegov projekte je najpomembnejša motivacija spodbujanje sodobne in trajnostne arhitekture v Afriki. Kéré kot nekdo, ki izhaja iz ruralne afriške družbe, v kateri je več kot osemdeset odstotkov prebivalcev nepismenih, in se mu je ponudila priložnost visoke izobrazbe v Evropi, si je kot nalogo zastavil, da pridobljeno znanje uporabi v korist prebivalcev svojega kontinenta.

Katerikoli otrok na svetu je ustvarjalen. Otroci pa za razvoj svojega potenciala potrebujejo izobrazbo. Prepričan sem, da s pomočjo inteligentne arhitekture lahko spodbudimo otroški potencial. To je tisto, kar skušam početi. (Francis Kéré)

Da bi dosegel trajnostno oblikovano arhitekturo, Kéréjevi projekti izhajajo iz vodila oblikovati klimatsko udobno in poceni gradnjo, ki izrablja lokalne materiale in potencial lokalne skupnosti, in, ki na preprost način uporabi prilagojeno tehnologijo industrializiranega sveta.

The deep motivation of the architect in his projects is to promote modern and sustainable architecture in Africa. As someone from a rural African community, with more than 80 % of the people being illiterate, who got the chance to attend higher education in Europe, he regards it as his duty to use his skills for the benefit of the people of his home continent.

"Every child in the world is full of creativity. What children need to use their potential is education. I am convinced that with the provision of intelligent architecture this potential can be advocated. That is what I am trying to do." (Francis Kéré)
To achieve sustainability, the projects are based on the principles of designing for climatic comfort with low-cost construction, making the most of local materials and the potential of the local community, and adapting technology from the industrialized world in a simple way.

With his first school in Gando, he taught the local people how to refine clay and local materials, and how different construction techniques could further



S svojo prvo šolo v vasi Gando je lokalne prebivalce naučil, kako izboljšati glino in ostale lokalne materiale, ter kako lahko različne tehnike gradnje še dodatno izboljšajo uporabnost zgradbe. Tako se lahko tisti, ki so pri gradnji sodelovali, v prihodnosti lotijo nadaljnjih gradbenih projektov, ne da bi potrebovali pomoč od zunaj.

Kmalu po otvoritvi je šola štela več kot 280 učencev iz Ganda in okoliških vasi, tako da jo je bilo potrebno razširiti. Kompleks šole pa dopolnjuje še prebivališča za učitelje in zdravstvena ambulanta.

Kéréjev namen je razširiti uporabo in razvoj tradicionalnih tehnik gradnje med lokalnim prebivalstvom ter razviti inovativne metode gradnje in gradbene rešitve primerne izrednim klimatskim razmeram.

Kéréjevi projekti so priznani po vsem svetu. Leta 2004 je za osnovno šolo v svoji rodni vasi Gando dobil nagrado Aga Khan za arhitekturo (Aga Khan Award for Architecture).

Osnovna šola v vasi Gando, 2001

V državi, v kateri ima dostop do šolanja le polovica šoloobveznih otrok, je za prebivalce male vasi Gando, ki šteje 3000 prebivalcev, osnovna šola nujen del infrastrukture. Medtem ko je še bil študent v Berlinu, je Kéré, prvi prebivalec vasi, ki je študiral v tujini, zbral zasebni denar in vladno podporo, s katerim bi nadomestil temno in razpadajočo šolo, ki je stala v vasi. Nova zgradba je del širšega kompleksa, ki vključuje še prebivališča za učitelje, vodnjak, vrtilčke in športno igrišče. Zgradba in uporabljeni materiali so popolnoma prilagojeni lokalnemu podnebjju in ekonomskim razmeram. Prostrana zgornja plast strehe pod seboj združuje vrsto treh učilnic. Med učilnicami se nahajajo pokriti, a odprti prostori za učenje in igro. Stene in strop, ki ga podpirajo ojačani tramovi, so zgrajeni iz blatnih opek, izdelanih v kraju. Opeke imajo dovolj mase, da ohranjajo toploto in zmanjšujejo nihanje temperature.

Zgornja streha daje senco fasadam in steptane blatne zidake ščiti pred dežjem. Zrak kroži med gornjo streho in stropom učilnic ter jih na ta način hladi. Tla v zgradbi so narejena iz steptane zemlje. Kovinska polkna je možno odpirati na različne načine, tako da skozi velika okna spuščajo dovolj zraka in svetlobe. V zgradbi les skorajda ni bil uporabljen, saj je težko dosegljiv pa še pogosto ga napadejo termiti. Vaščani so pri gradnji šole sodelovali v vseh različnih stopnjah. Tekom programa izučevanja so dobili navodila za izdelavo glinenih opek, lokalni kovinarji so izdelali streho in polkna, otroci so pomagali prestaviti kamenje in ženske so pomagale prinašati vodo nekaj kilometrov daleč.

Naročnik: Vaška skupnost Gando

Površina: 526 m²

Cena: približno 35.000 evrov

improve the performance. By that, the instructed people who worked on the construction were able to undertake their own building projects without the need of outside help in the future.

Soon after the opening, the school counts more than 280 pupils from Gando and its surrounding villages, this made an extension obligatory. Meanwhile the school-complex of the village is accomplished through teacher's houses and a hospital ward.

The aims of Francis Kéré are to further the use and development of traditional building techniques among local communities, and to develop innovative methods and building solutions for extreme climatic conditions.

The projects of Francis Kéré are worldwide acknowledged. In the year 2004 he won the "Aga Khan Award for Architecture" for the primary school in his home village Gando.

Primary school in Gando, 2001

In a country where only half the primary-school-aged children receive an education, this school provides a necessary facility for the residents of Gando, a small village of 3,000 people. While still an architecture student in Berlin, Kéré, the first person in his village to study abroad, raised private money and government support to replace Gando's existing dark and crumbling school. The new building forms part of a larger complex which includes teachers' housing, a well, allotments and a sports field. The building and materials are perfectly adapted to both local climate and economic conditions. A large oversailing roof unites three linearly arranged classrooms. Covered outdoor teaching and play spaces sit between the classrooms. Walls and ceiling are constructed of locally made earth blocks, the ceiling supported on reinforcement bars. These provide thermal mass and reduce temperature fluctuation. The roof shades the facades and protects the rammed earth from rain. Cooling air is allowed to flow between the roof and the classroom ceilings. The floor is made of beaten earth. Metal shutters can be opened in various configurations to admit light and air through large windows. Timber, difficult to obtain and subject to termite attack, was hardly used. Villagers were involved in every aspect of the school's construction. Training programmes provided instruction in making clay blocks, local smiths fabricated the roof and shutters, children helped move stones and women helped carry water from several kilometres away.

Client: Village community of Gando

Area: 526 sqm

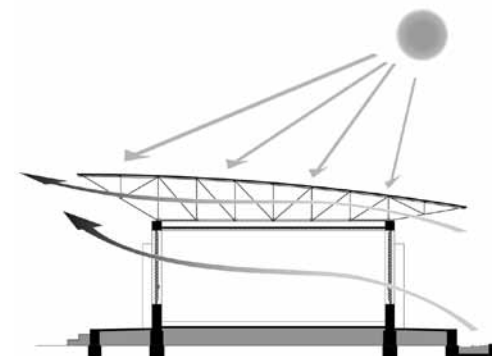
Cost: ca. 35,000 EUR



Osnovna šola v vasi Gando, 2001, pogled od strani.
Elementary School in Gando, 2001, view from the side.



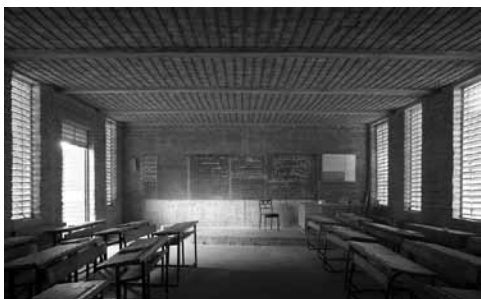
Osnovna šola v vasi Gando, 2001, med gradnjo strehe.
Elementary School in Gando, 2001, the construction of the roof.



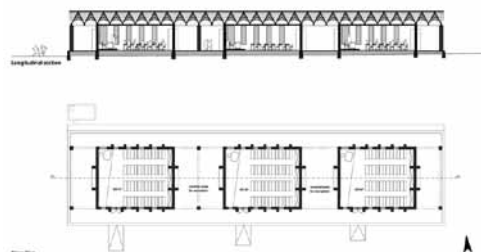
Osnovna šola v vasi Gando, 2001, shema prezračevanja.
Elementary School in Gando, 2001, the climatic scheme.



Osnovna šola v vasi Gando, 2001.
Elementary School in Gando, 2001.



Osnovna šola v vasi Gando, 2001, učilnica
Elementary School in Gando, 2001, classroom.



Osnovna šola v vasi Gando, 2001, tloris in prezez
Elementary School in Gando, 2001, plan and section.



Razširitev osnovne šole v vasi Gando, 2008, pogled s strani.
Extension of the Elementary School in Gando, 2008, view from the side.



Razširitev osnovne šole v vasi Gando, 2008, pokrito dvorišče.
Extension of the Elementary School in Gando, 2008, the covered courtyard.

Razširite šole v Gando, 2008

Razširitev šole v Gando je posledica uspeha prve šole, ki je bila v tam dokončana leta 2001 in je imela prostor za 120 učencev. Ker je bila šola tako kvalitetna in ker se je celotna vaška skupnost tako močno identificirala z njo, jo je v dveh letih po odprtju želelo obiskovati že 260 otrok. Potrebna je bila razširitev.

Oblikovalski principi sledijo podobnemu premisleku podnebja kot pri prvi šoli, vendar z drugačnim izrazom. Namesto masivnega stropa, ki smo ga uporabili pri prvi šoli, je v novem delu strop obokan in ima reže, skozi katere pada svetloba, vroč zrak pa se skozi nje vzdiguje. Zaradi boljše klime v šoli je notranjost obokov prelučnjana. Zrak, ki je ujet v luknjah, deluje kot blažilo in pomaga preprečevati pretirano pregrevanje v učilnicah. Zaščito pred soncem in dežjem zopet predstavlja prostrana kovinska zgornja streha. Zgornja streha absorbira neposredno sončno svetlobo in omogoča kroženje zraka med obema plastema stropa, kar iz zgradbe odvaja vroč zrak, tako da streha predstavlja gonilo naravnega sistema prezračevanja.

Kar se tiče sodelovanja ljudi pri gradnji, se je to od prvih precej spremenilo. Med gradnjo so v Gando prišli prebivalci vseh okoliških vaških skupnosti in pomagali pri gradnji razširitve. To je bilo nekaj novega v tistem področju in je pomenilo preobrat v dojemanju skupnosti. Projekt gradnje šole na tem območju še nikoli ni zbujal toliko pričakovanj. Nad neizmernim navdušenjem prebivalcev za svoj projekt je bila presenečena celo vlada, ki trenutno skuša najti način, kako bi dolgoročno podpirala šole.

Srednja šola Dano

Projekt je prizidek k obstoječemu šolskemu kompleksu v obliki črke L na obrobju manjšega mesta Dano v Burkini Faso. Arhitektura uporablja lokalne materiale in trajnostno oblikovanje, ki se odziva na specifične podnebne zahteve. Nova zgradba zapira južni del kompleksa in je obrnjena tako, da znižuje količino neposredne sončne svetlobe, ki pada na zidove, ki so pred soncem zaščiteni tudi z valovito ponjavo. Prizidek je sestavljen iz treh ločenih zgradb, v katerih so učilnice, pisarne in soba z računalniki. Odprti ovalni amfiteater služi kot prostor za posedanje med odmori. Vse skupaj je prekrito s konzolno strešno konstrukcijo s strešniki, ki z valovitimi nišami ustvarja ritem v kontrastu s pravilnim kvadrom zgradbe pod njo. Zidovi so narejeni iz lokalno dostopnega laterita (ki je ojačan s tanko plastjo cementa, tako da so nosilni zidovi skupaj debeli 30 cm) in stojijo na kamnitih granitnih temeljih. Senčila, ki zakrivajo visoka okna, so pravilno razporejena in pobarvana z živimi barvami, ki označujejo, čemu je namenjen notranji prostor. Streha je sestavljena iz 3 m širokih modularnih elementov, sestavljenih iz 14

Project description: Primary school extension in Gando, 2008

The school extension building in Gando is the result of the success of the first school building which was finished in 2001 and gave space for 120 students. Because of the high quality and the strong identification of the entire village community with the building, two years after the opening more than 260 children wanted to attend education in that school. Which made an extension inevitable.

The design principle follows the same climatic considerations as in the first school. But in a different physical expression. Instead of massive ceiling used in the first school, the ceiling of the extension building is a vault with slits for light and outlets for the overheated air. For climatic reasons, cavities have been integrated in the vault. The enclosed air in the cavities works as a buffer and helps to reduce overheating inside the classrooms. The protection against rain and sun is provided like in the first school by an overlaying metal roof. This roof, which absorbs the direct sunlight, makes the air between the two layers circulate and guides the hot air out of the building, and can be considered as the motor of this natural ventilation system.

Regarding the participation of the people in the building process there was a big difference to the first one. During the work process all the surrounding village communities of Gando, came to help to build the extension. This was very new in the region and initiated a turning point in the perception of the community. Never before a school project has raised expectations like this in the region.

Even the government was surprised by the overwhelming interest of the people for their project and is about to find ways to support the schools in the long run.

High School Dano

Situated at the edge of a small town in Burkina Faso, the project comprises an L-shaped addition to an existing school complex. The design incorporates locally available materials and sustainable features that respond to the specific constraints of climate. This new building closes the southern corner of the compound and is oriented to reduce direct sunlight onto the walls, which are themselves protected from the sun by a wave-like canopy. The extension comprises three individual blocks housing classroom, offices and a computer room. An oval amphitheatre, open to the exterior, serves as a sitting area during the breaks. The ensemble is covered by a tilted, cantilevering roof structure whose undulating bays create a rhythm against the orthogonal enclosure below. Walls of locally available laterite (laminated with thin layers of cement to form 30 cm thick, load bearing partitions) sit on a granite stone bed. Regularly spaced, tall window shutters are painted in bright colours that vary with the activity inside. The roof consists of 3 m wide, modular

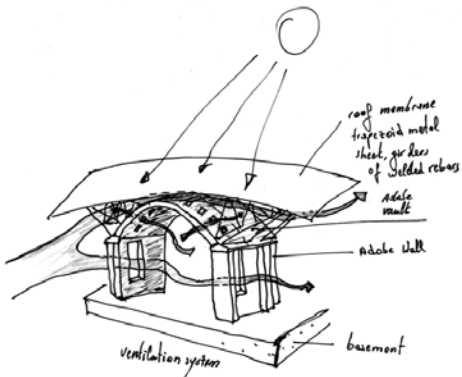


in 16 mm debelih železnih palic, ki so jih zvarili na kraju samem.

Valovita streha, pritrjena na strešno osnovo, no-tranjost varuje pred vplivi okolja. V učilnicah je valovit obešen strop razdeljen v 3 metrske intervale, ki odražajo zunanjo strukturo. Reže v stropu omogočajo, da skozi njih izhaja vroč zrak in zgradbi zagotavljajo naravno prezračevanje. Spodnji del stropa, ki je sestavljen iz cementnih kamnov, obešenih na tanko valjano jekleno konstrukcijo, je pobarvan odbojno belo barvo, ki razprši svetlobo v učilnicah. Tekom gradnje so se lokalni obrtniki priučili novih gradbenih tehnik, in tako zagotovili, da se nove metode zasidrajo v skupnosti.



Razširitev osnovne šole v vasi Gando, 2008, fasada in pogled s sprednje strani.
Extension of the Elementary School in Gando, 2008, façade and front view.

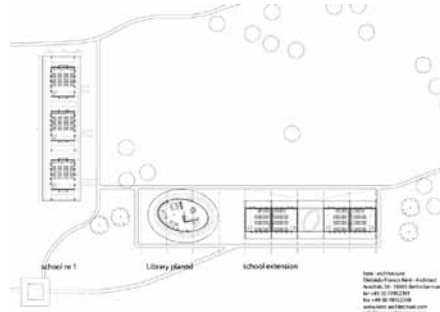


Razširitev osnovne šole v vasi Gando, 2008, skica prezračevanja.
Extension of the Elementary School in Gando, 2008, sketch of the ventilation.



Razširitev osnovne šole v vasi Gando, 2008, učilnica.
Extension of the Elementary School in Gando, 2008, classroom.

elements assembled from 14 mm and 16 mm thick iron bars and welded together on site. Corrugated roofing fixed to the assemblage protects the interior from the elements. Within the classrooms, a wave-like suspended ceiling defined into 3 m bays recalls the exterior structure. Slits in the ceiling allow hot air to exhaust through the roof, keeping the building naturally ventilated. Comprised of cement stones hanging on the construction of thin, flat rolled steel, the bottom side of the ceiling is painted in reflective white to distribute light within the classrooms. Throughout the construction process, local artisans were trained in new techniques, ensuring that building methods would stay within the community.



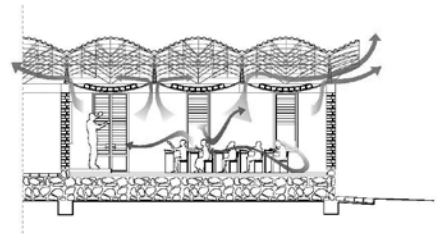
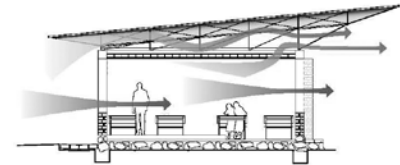
Osnovna šola v vasi Gando z razširitvijo, 2001, 2008, celotno območje obeh šol.
Elementary School in Gando with extension, 2001, 2008, plan of the whole area.



Srednja šola v mestu Dano, 2007.
High School in Dano, 2007.



Srednja šola v mestu Dano, 2007.
High School in Dano, 2007.



Srednja šola v mestu Dano, 2007, diagram prezračevanja.
High School in Dano, 2007, climate diagram.



Srednja šola v mestu Dano, 2007, učilnica.
High School in Dano, 2007, classroom.



Srednja šola v mestu Dano, 2007, amfiteater.
High School in Dano, 2007, amphitheatre.

Srednja šola v mestu Dano, 2007, prerez.
High School in Dano, 2007, section.

