

POLITECNICO DI TORINO  
SECOND SCHOOL OF ARCHITECTURE  
Master of Science in Architecture for Sustainability  
***Honors theses***

---

**Dakar\_ecole\_urbaine**

by Francesco Simone Gadaleta

Tutor: Carlo Ravagnati

Co-tutor: Enrico Giacobelli

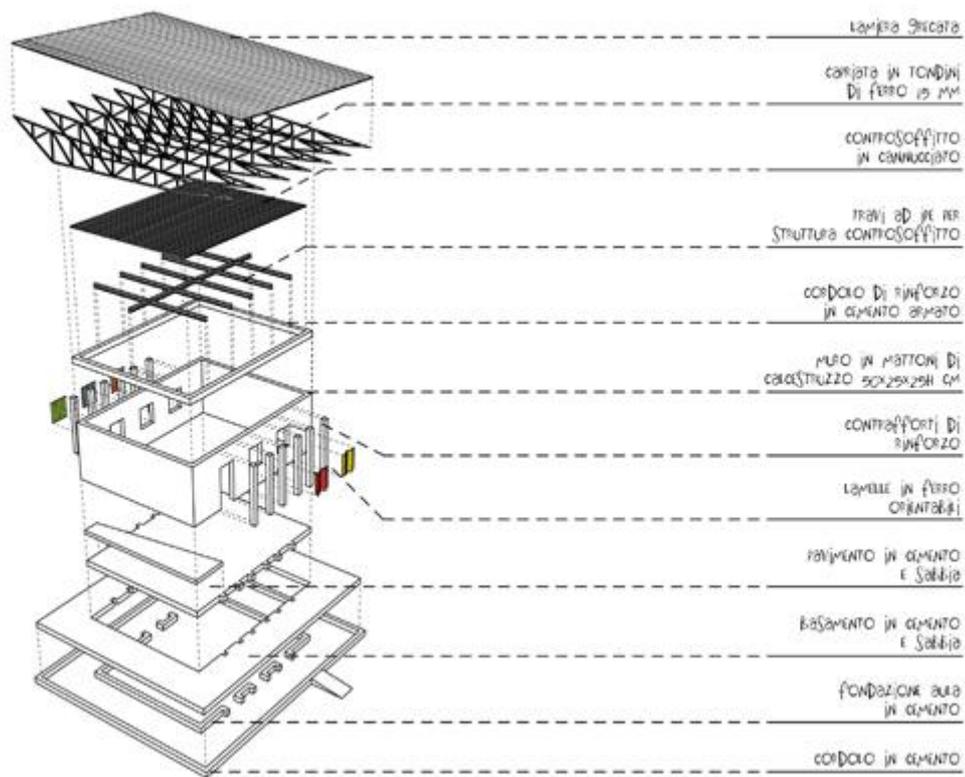
The aim of the thesis is to pay attention to the problems of the educational system and the situation of Senegalese school facilities currently on the territory of Dakar and explains an alternative to improve them, creating a model applicable to the entire city.

The project draws attention to the particular climatic characteristics of the region. The study of ventilation, through the analysis of the prevailing winds, the intensity of the rains and the study of the sun have been key to the realization of the idea.

The particular economic condition in which it is located Senegal, does not allow the state to allocate large sums for education. Therefore, they are less and less new schools built and existing ones are getting in bad condition. The thesis aims to find a solution to this problem by redefining the standards for schools on the basis of the Italians. This greatly reduces the surface occupied the school building. In the remaining part of the lot will one building, not addressed in the examination. With the proceeds of its sale, you will build the school. Thanks to the creation of some business activities, we will for the maintenance of the school.

The main generators of the whole project are:

- open space on which the classrooms overlook
- optimum orientation depending on the position of the sun
- optimal orientation as a function of the prevailing winds
- simple technology
- provision of things to rent for the maintenance of school
- image quality
- integration of the building into the lives of children

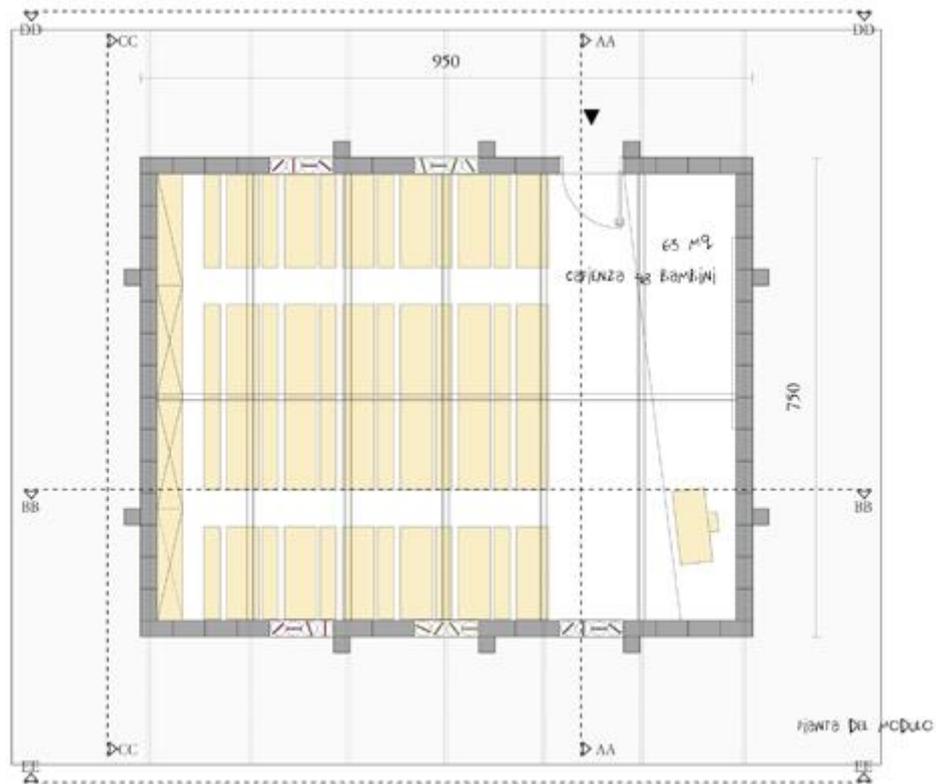


Exploded view of the module

The research is directed towards the use of materials are simple, inexpensive, durable and available in situ, which require minimal maintenance and, above all, the local population is able to manage.

The module subject of study has a rectangular shape: 9,5 x 7,5 m. Each classroom has a floor area of 63 mq, as required by local regulations.

The school is made of concrete blocks of the measure 50 x 25 x 25 cm; wall thickness ensures a good thermal inertia and causes temperature variations will note at a favorable time delay.



Plant module

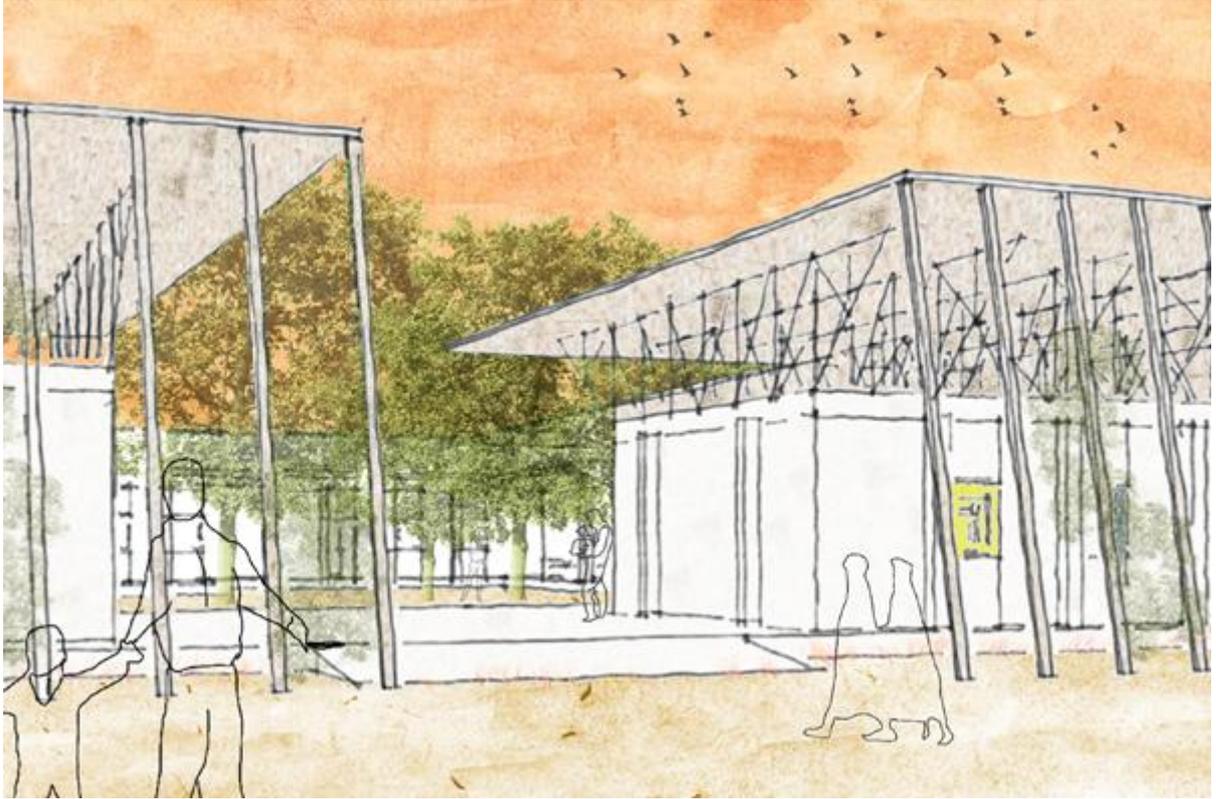
The module has some buttresses on each side, working together with the structure and stiffen the walls. A further stiffening element is constituted by a bead of reinforced concrete that runs along the entire perimeter of the walls, 25 cm high . On it support trusses, made of iron rods of 15 mm, which hold the cover plate on an angle. The module relies on mat foundation, concrete raised 30 cm from the ground to avoid the excavations for the foundations and to prevent that, during the rainy season, the water enters inside the classrooms allogandole .

The module provides for the realization of three openings for each long side. The windows have no glass or plexiglass because it totally useless in these latitudes, and are fitted with fins colored iron, adjustable thanks to a pin stuck in the wall.

The module finally presents a countertop, a thickness of 2 cm, made in cannucciato, which promotes the natural ventilation inside .

It should also be noted that the openings of the module - placed in line with each other - have been specially designed to facilitate the passage of air, lead to a renewal of its purity and increase the effects refrigerativi and the thermal comfort of the classroom.

The roof of the module was then designed in a raised position with respect to the slab, so as to allow a constant circulation of air and to avoid the stagnation of the heat below the cover. The roof juts out finally from the line of the walls and protects the classrooms from annoying direct radiation.



View from the entrance

For further information, e-mail:  
Francesco Simone Gadaleta: [gadaleta.fs@gmail.com](mailto:gadaleta.fs@gmail.com)

---

Maintained by:  
CISDA - HypArc, e-mail: [hyparc@polito.it](mailto:hyparc@polito.it)