



S⁴ SAUCHALAY

SELF SUSTAINABLE SANITARY SYSTEM

A Bollywood movie called Toilet: Ek Prem Katha, debuted about a woman in India who left her marriage because her husband wouldn't build a toilet in their house. It sounds farfetched but it's actually based on a true story. And it highlights a very real, very serious issue in much of the developing world. Many people defecate, by choice or necessity, out in the open.

Where does this leave schools?

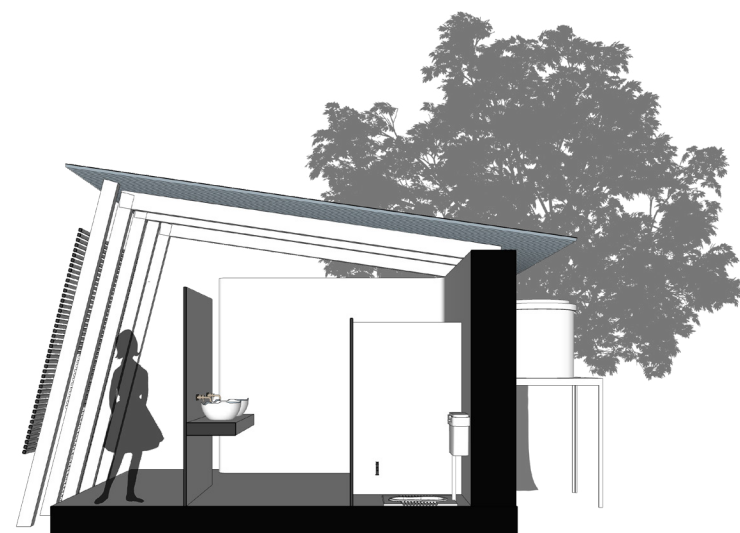
The answer was pretty grim: not in a good place. Nearly 40 percent of the 1.5 million schools in India lacked a bathroom; the percentage was even higher when looking at usable bathrooms specifically for girls not having a bathroom was not only inconvenient, but highly detrimental for students and teachers, especially girls and women, anxiety over being seen going outside, fear of being taunted or raped. In India 50% of the rape cases happen when girls and women go out for relieving themselves.

Now as Architects we are trying to participate in changing this situation and obligating the authorities by providing a low cost, innovative, and easy to construct Design.

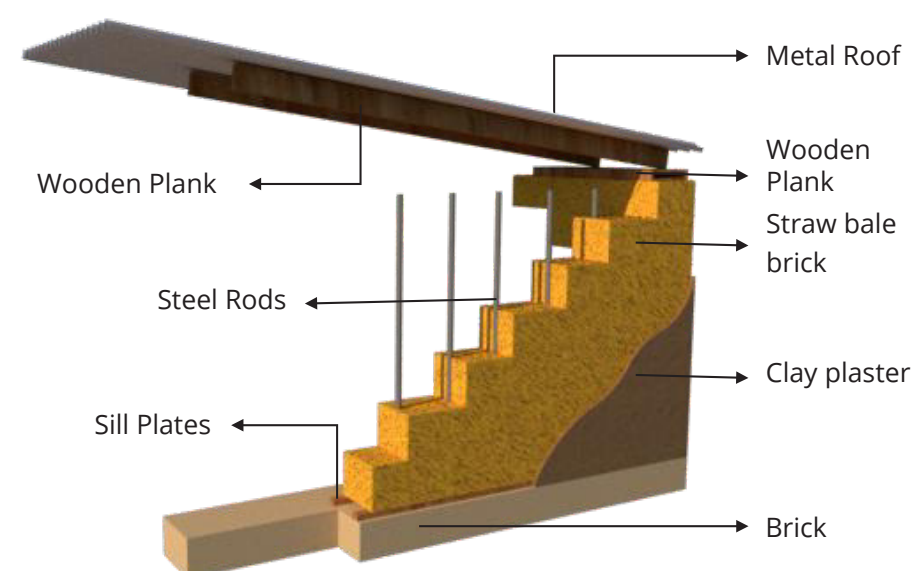


DESIGN PROPOSAL

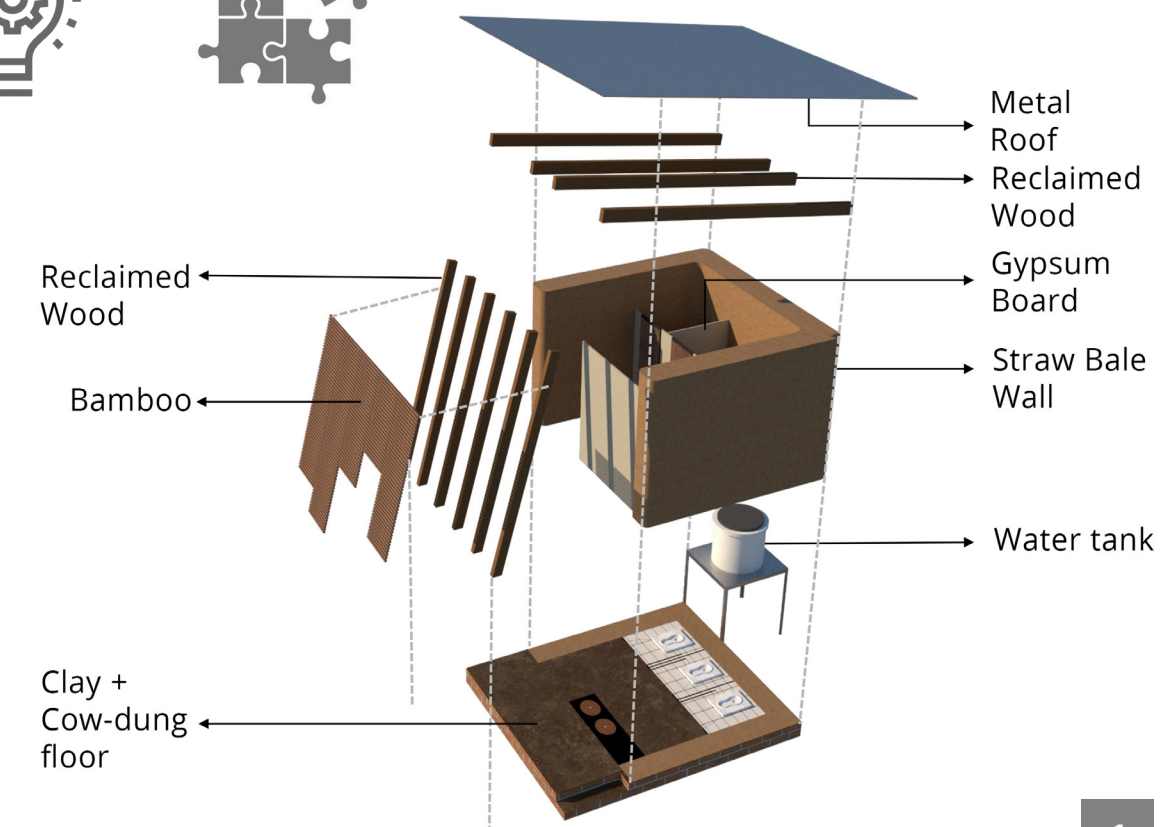
The proposal is to create a girls' washroom which is super cost-effective and is made of locally resourced material. The principle raw material is such that it is available locally and is common among most of the rural. Finally we zeroed down to use straw bale as the building material, as straw is considered a waste material and is locally available in ample quantity, so, use in construction is environment friendly. We kept the design of the building simple as well as modular which can be constructed within three days. The toilet is designed to be porous and well ventilated, allowing the structure to breathe. We can incorporate a sustainable revenue model to meet the requirement of maintenance. Sustainable means of lighting, water harvesting and reusing the waste as manure can be additionally incorporated in this design.



Section



Load bearing straw bale construction



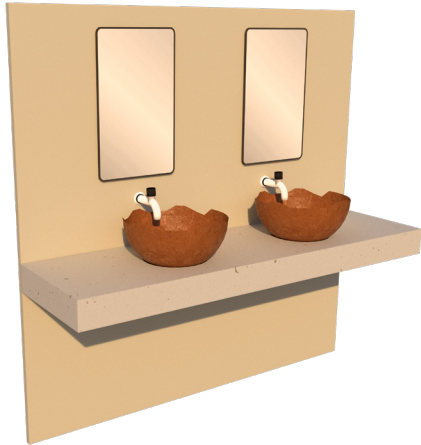
Exploded View

STRAW BALE AS CONSTRUCTION MATERIAL

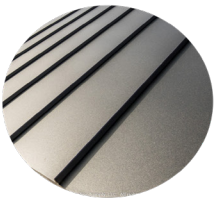
Straw is a natural fiber that we get as a byproduct from agriculture. We can get this from wheat, rice, oats, hops, barley. Straw bale is simply a compressed bundle of straw which can be arranged in a square, rectangular, or round shape attached with wire or twines. India is one of the largest countries enlisted in the production of straw bale. Since a large population is solely dependent upon agriculture so the potential of straw bale construction in India is exclusively high. Straw is an easy, cheaply available material and requires limited transportation and does not require any transformation, and can be easily handled. Straw is getting lots of preference in many countries because it is cost-effective with high health value, aesthetic value, thermal performance, fire resistance, light weight, and eco-friendly nature. It also has a good response against earthquakes, so it can be used in earthquake-prone areas as well.

ADAPTABILITY

Our whole design is based on the concept of adaptive architecture i.e. each and every element of the structure can be interchanged with other products on the basis of availability and the budget of the project, making it a more adaptable design



Recycled earthen pot washbasin



Metal roof



Thatched roof



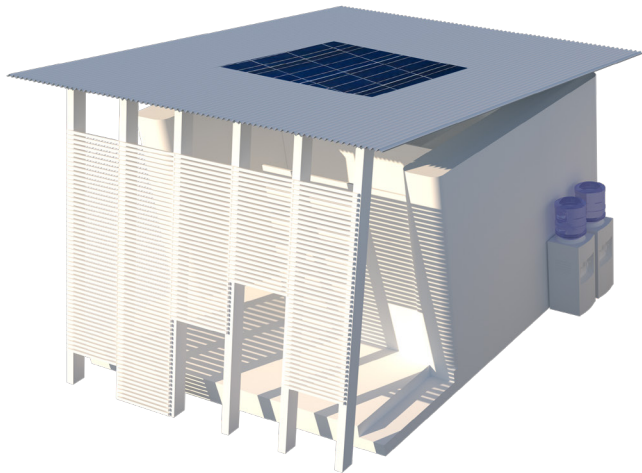
Terracotta roof



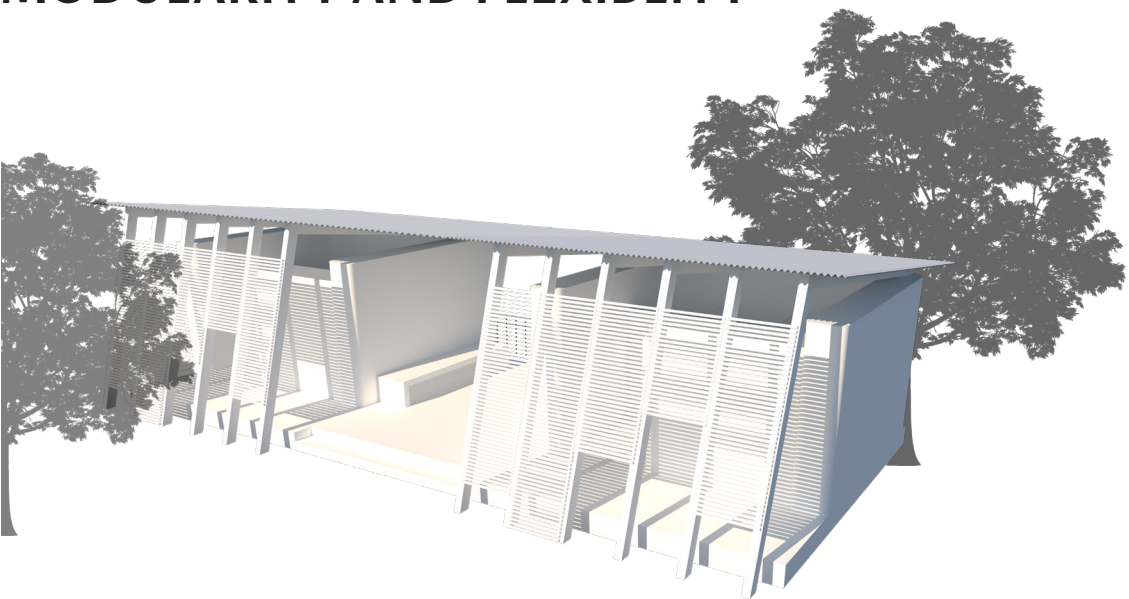
Bamboo planks



Reclaimed wood



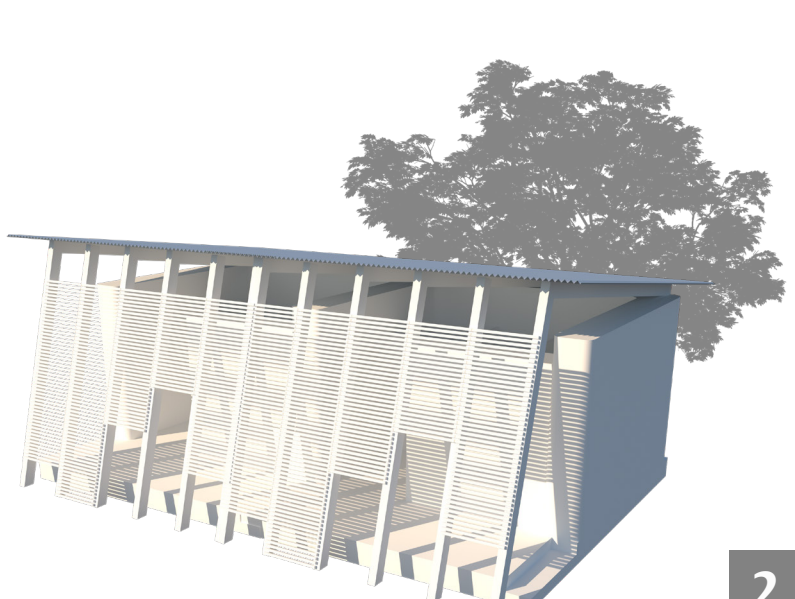
MODULARITY AND FLEXIBILITY



Two combined units with seating spaces



Male and Female Washroom



Six cubicles unit



Many aspects of construction can be great fun. Bale construction is fun for two reasons. The first reason is with a good design, careful organization, and the guidance of a few skilled people, it is possible to keep dozens of volunteers (such as students) engaged in various stages of bale and plasterwork. Because the process can be broken down into many distinct tasks, people are free to try different jobs and learn various skills. The synergy of this group effort is one of the greatest thrills of straw bale construction. The second reason is that laying bales and applying plaster are essentially right-brain activities. Stacking bales are much more like playing with blocks than it is like any mainstream construction practice.

Estimation					
S. No.	Description of Material	Quantity	Unit	Rate	Amount(Rupees)
1	Straw bale brick	76	Kg	80	6080
2	Roofing	22.88	Sq. m	300	6840
3	Brick	152	Piece	8	1216
4	Partition walls	12.96	Sq. m.	600	7776
5	Water tank (300 L)	1	Piece	-	3000
6	Septic tank (500 L)	1	Piece	5.5	2750
7	Tiles	54	Piece	13	702
8	Indian seat pan	3	Piece	1500	4500
9	Washbasin (recycled earthen pot)	2	-	NA	-
10	Washbasin tap	2	Piece	200	400
11	WC Tap	3	Piece	75	225
12	Washbasin pipe	2	Piece	70	140
13	Mirror	2	Piece	250	500
	Total				34129
	Miscellaneous				4500