Transcript: The 3 Design Strategies Keeping This Building Cool In Scorching Heat

Video ID: oGX7yosSLCc

Extraction Date: 2025-04-02 06:46:32

**[00:00:00]** this building is an award-winning school

**[00:00:02]** where students study under scorching

**[00:00:04]** heat without using any air conditioning

**[00:00:07]** this is because it's using three

**[00:00:09]** ingenious passive strategies to stay

**[00:00:11]** cool for most of the year in this video

**[00:00:13]** we're going to explore how it's even

**[00:00:15]** possible for a building to function

**[00:00:17]** under this kind of heat the three simple

**[00:00:20]** design strategies that the architect

**[00:00:21]** used to achieve this result and the

**[00:00:23]** reason why the shape of the roof played

**[00:00:26]** a significant part in enhancing the

**[00:00:28]** effectiveness of these Strat IES but to

**[00:00:31]** accurately explain this we need to

**[00:00:33]** understand how hot are we talking here

**[00:00:35]** gando is a small village in borina Fel

**[00:00:38]** and has a hot semi arid climate it

**[00:00:41]** experiences high temperatures during the

**[00:00:43]** year often exceeding 35° Celsius in the

**[00:00:47]** hottest months of the year as you can

**[00:00:49]** see in the pyrometric chart the bulk of

**[00:00:51]** the hours throughout the year which are

**[00:00:53]** the little blue dots are between 20 and

**[00:00:56]** 40° C with a climate like this design

**[00:00:59]** IES focus on natural ventilation but

**[00:01:02]** with temperatures reaching such high

**[00:01:04]** levels plain old cross ventilation would

**[00:01:08]** not have been enough to keep the

**[00:01:09]** building comfortable let me explain in

**[00:01:12]** hot climates direct sunlight is by far

**[00:01:15]** the largest contributor to overheating

**[00:01:17]** inside the building simply introducing

**[00:01:20]** cross ventilation would not have been

**[00:01:22]** enough to keep the classroom comfortable

**[00:01:23]** for the children the architect Francis K

**[00:01:26]** who grew up in the village knew this

**[00:01:28]** very well he introduced produced a

**[00:01:30]** curved double roof that created an air

**[00:01:32]** gap between the first and second roof as

**[00:01:34]** the heat naturally Rises and escapes

**[00:01:37]** into the Gap the prevailing winds

**[00:01:39]** quickly carry it away accelerating this

**[00:01:42]** process and cooling the building more

**[00:01:45]** efficiently but that's not all the first

**[00:01:47]** roof is made up of perforated ceiling

**[00:01:49]** slabs allowing the heat to escape more

**[00:01:51]** efficiently and therefore to be quickly

**[00:01:54]** transported by the wind the other genius

**[00:01:56]** idea was to also curve the roof which

**[00:02:00]** allowed for the Venturi effect a

**[00:02:02]** phenomenon where air speeds up as it

**[00:02:05]** moves through the narrower sections

**[00:02:07]** created by the curve and therefore

**[00:02:09]** boosting natural ventilation which bring

**[00:02:12]** us on to strategy number two see the

**[00:02:15]** genius of an architecture intervention

**[00:02:17]** in my opinion is to always be very

**[00:02:20]** intentional about every element of a

**[00:02:23]** building and that often means hitting

**[00:02:26]** two or multiple birds with one stone and

**[00:02:29]** this is ex exactly what the double roof

**[00:02:31]** is doing not only is it enhancing

**[00:02:33]** natural ventilation but it's providing

**[00:02:36]** critical shading for the building see

**[00:02:38]** the angle of the Sun in borina Faso is

**[00:02:41]** pretty steep even during winter which

**[00:02:43]** means that the sun is always high in the

**[00:02:46]** sky and because it is quite hot all year

**[00:02:49]** long there is actually no need for solar

**[00:02:52]** gains Through the Windows the canopy of

**[00:02:54]** the roof is therefore designed to stop

**[00:02:57]** the harsh Sun from entering the building

**[00:02:59]** even during during winter on the other

**[00:03:01]** hand in the summer solstice when the sun

**[00:03:03]** is at its highest and possibly harshest

**[00:03:07]** not only does the canopy stop the Sun

**[00:03:08]** from entering the building it also

**[00:03:11]** provides a shaded area where the

**[00:03:13]** children can linger outside of the

**[00:03:15]** building but with all this excess heat

**[00:03:17]** there is one more strategy that has been

**[00:03:19]** vital in protecting the building from

**[00:03:22]** the harshest heat of the day see the

**[00:03:24]** climate conditions in gando just like in

**[00:03:27]** a desert lead to significant temperature

**[00:03:29]** fluctuations between day and night with

**[00:03:32]** the nights being cooler the heat of the

**[00:03:35]** day can be stored in the walls while

**[00:03:37]** classes in session protecting the

**[00:03:39]** classroom from the bulk of the heat

**[00:03:41]** during the night when the classroom is

**[00:03:43]** empty and the temperatures drop outside

**[00:03:46]** that heat is slowly released from the

**[00:03:48]** walls and quickly disposed of through

**[00:03:51]** ventilation and to achieve this Kare

**[00:03:53]** used compressed Earth blocks for the

**[00:03:56]** external walls which not only have

**[00:03:58]** amazing thermal Mass capabilities they

**[00:04:01]** could be made locally by the villagers

**[00:04:03]** in the most economic way combining these

**[00:04:06]** three strategies a very well-designed

**[00:04:08]** double roof thoughtful shading and great

**[00:04:11]** thermal mass is one of the reasons this

**[00:04:13]** building won the aacan award for

**[00:04:15]** architecture in 2004 which recognizes

**[00:04:18]** and rewards architectural Concepts that

**[00:04:21]** address the needs and aspirations of

**[00:04:23]** Muslim Societies in a presentation

**[00:04:26]** Francis Kare said that his people refer

**[00:04:28]** to his buildings as big fridges which

**[00:04:31]** according to him is a big compliment but

**[00:04:34]** in nature it is an unpretentious

**[00:04:37]** approach to design that wasn't after

**[00:04:39]** recognition or accolades it wasn't

**[00:04:41]** trying to achieve a lead certification

**[00:04:44]** or an energy star score it was just what

**[00:04:47]** made sense for the climate the available

**[00:04:50]** resources and the local community this

**[00:04:52]** approach is quite unique but Kare is not

**[00:04:55]** the only architect fighting the good

**[00:04:56]** fight in developing countries these

**[00:04:59]** three women right here are doing very

**[00:05:01]** similar work focusing on people and

**[00:05:03]** communities so make sure you watch this

**[00:05:05]** video to check out their amazing

**[00:05:07]** projects

# Full Text (without timestamps)

this building is an award-winning school where students study under scorching heat without using any air conditioning this is because it's using three ingenious passive strategies to stay cool for most of the year in this video we're going to explore how it's even possible for a building to function under this kind of heat the three simple design strategies that the architect used to achieve this result and the reason why the shape of the roof played a significant part in enhancing the effectiveness of these Strat IES but to accurately explain this we need to understand how hot are we talking here gando is a small village in borina Fel and has a hot semi arid climate it experiences high temperatures during the year often exceeding 35° Celsius in the hottest months of the year as you can see in the pyrometric chart the bulk of the hours throughout the year which are the little blue dots are between 20 and 40° C with a climate like this design IES focus on natural ventilation but with temperatures reaching such high levels plain old cross ventilation would not have been enough to keep the building comfortable let me explain in hot climates direct sunlight is by far the largest contributor to overheating inside the building simply introducing cross ventilation would not have been enough to keep the classroom comfortable for the children the architect Francis K who grew up in the village knew this very well he introduced produced a curved double roof that created an air gap between the first and second roof as the heat naturally Rises and escapes into the Gap the prevailing winds quickly carry it away accelerating this process and cooling the building more efficiently but that's not all the first roof is made up of perforated ceiling slabs allowing the heat to escape more efficiently and therefore to be quickly transported by the wind the other genius idea was to also curve the roof which allowed for the Venturi effect a phenomenon where air speeds up as it moves through the narrower sections created by the curve and therefore boosting natural ventilation which bring us on to strategy number two see the genius of an architecture intervention in my opinion is to always be very intentional about every element of a building and that often means hitting two or multiple birds with one stone and this is ex exactly what the double roof is doing not only is it enhancing natural ventilation but it's providing critical shading for the building see the angle of the Sun in borina Faso is pretty steep even during winter which means that the sun is always high in the sky and because it is quite hot all year long there is actually no need for solar gains Through the Windows the canopy of the roof is therefore designed to stop the harsh Sun from entering the building even during during winter on the other hand in the summer solstice when the sun is at its highest and possibly harshest not only does the canopy stop the Sun from entering the building it also provides a shaded area where the children can linger outside of the building but with all this excess heat there is one more strategy that has been vital in protecting the building from the harshest heat of the day see the climate conditions in gando just like in a desert lead to significant temperature fluctuations between day and night with the nights being cooler the heat of the day can be stored in the walls while classes in session protecting the classroom from the bulk of the heat during the night when the classroom is empty and the temperatures drop outside that heat is slowly released from the walls and quickly disposed of through ventilation and to achieve this Kare used compressed Earth blocks for the external walls which not only have amazing thermal Mass capabilities they could be made locally by the villagers in the most economic way combining these three strategies a very well-designed double roof thoughtful shading and great thermal mass is one of the reasons this building won the aacan award for architecture in 2004 which recognizes and rewards architectural Concepts that address the needs and aspirations of Muslim Societies in a presentation Francis Kare said that his people refer to his buildings as big fridges which according to him is a big compliment but in nature it is an unpretentious approach to design that wasn't after recognition or accolades it wasn't trying to achieve a lead certification or an energy star score it was just what made sense for the climate the available resources and the local community this approach is quite unique but Kare is not the only architect fighting the good fight in developing countries these three women right here are doing very similar work focusing on people and communities so make sure you watch this video to check out their amazing projects