Vernacular Design Case Examples
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Lecture 30
Vernacular and Responsive Design using Net-Zero Energy, Lighting Ventilation, Views, etc., for Human Comfort

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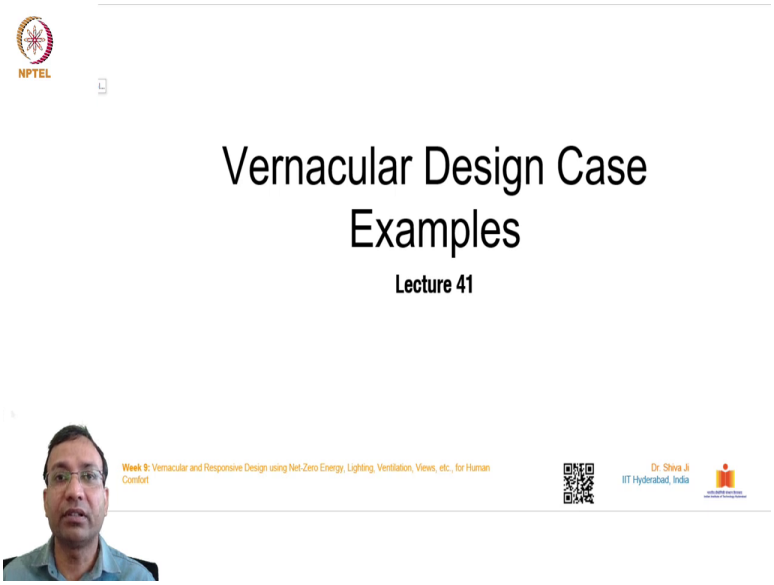

Hello, everyone. In this lecture we will discuss about Vernacular Case Examples. So, we will see the examples of vernacular design from architecture like how these designs have evolved over time and they have been addressing the actually climate-related responses. As far as building is concerned, a habitation unit is concerned in different geographical and climatic locations.

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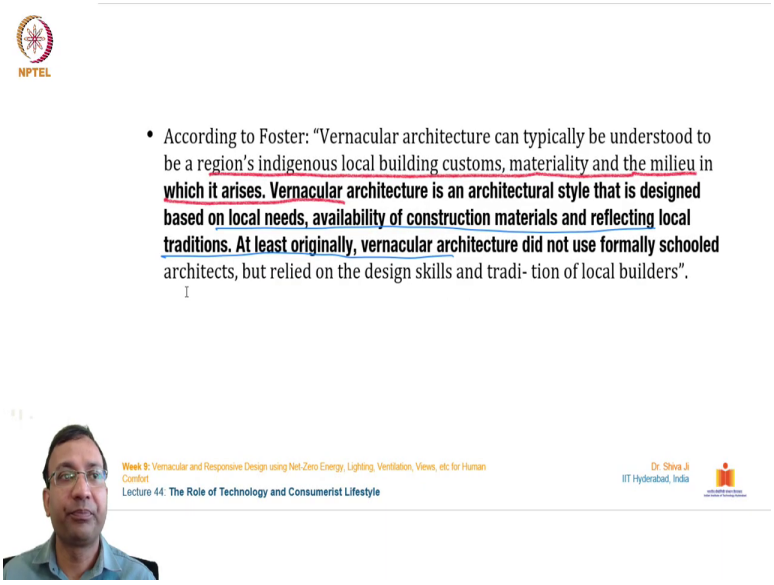

So, if you see according to the Foster, what is vernacular? So, vernacular architecture can typically be understood to be a region's indigenous local building customs, materially and the milieu in which it arises. Vernacular architecture is an architectural style that is designed based on local needs, availability of construction materials and reflecting local traditions. At least originally, vernacular architecture did not use formally schooled architects, but relied on the design, skills and tradition of local builders.

So, you can see vernacular architecture is part of a local culture, a culture in an overall sense involves like art, music, a food habits, clothing, even architecture. So, this vernacular architecture has a lot to do with that particular place and it evolves while passing through generations and generations like how the people of that place or that community, a fine resources in the vicinity in the local surrounding areas, whatever they could source in a more natural way, more saddle way without bringing stuff faraway places or very distant places or may be a manufactured things from factories and manufacturing units what we are getting surprise from these days.

So, not actually using those kinds of materials, but using very, very raw, very, very local, very, very authentic natural materials such as like adobe, thatch, bamboos, stone, whatever they could found in that place. And that is why you will see the characteristic of the vernacular architecture and the features of these vernacular architectures. They change from place to place, because they

are very, very rooted to that particular place. So, this is the one region. So, why this is important to understand over here in this actually globalized form of architecture which is evolving in the recent years in these days.

So, there is a trend that the buildings irrespective of the location of that particular slight it is, they are all almost the same, because they are utilizing the same construction materials and there is one a global structural system which has evolved so irrespective of the place that is all the same everywhere and irrespective of distance, we are able to still source and get those materials which are manufactured from very distance places within the country or even outside the country.

So, in this globalization scenario, this vernacularity of the architecture is getting lost. So, well, there are several advantages to this going for the globalized way of developing and designing architecture, but there are some disadvantages also. Well, disadvantages are the biggest ones what we can see, like we are not utilizing the natural elements and natural things which are available in the surrounding, but we are relying on the electricity-based gadgets, tools, mechanical systems to fulfill the comfortable requirements in any given building, for example, temperature, humidity, wind, sound. So, we are relying on mechanical methods of a controlling these things irrespective of going along with the nature. So, that is one of regions things are, have changed in the recent time. So, we will see some examples.

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There is one very famous crafts museum, so, in New Delhi. So, this museum has a several artifacts of craft and all, but it uses, if you see, the building itself in the premises of this craft museum itself this is made up, this is constructed in a very vernacular way. It appears like yes it is a piece from older time. It is a piece which belongs to maybe a local area.

So, it uses you see these materials, these roofing materials, these walling, these are patterns which are drawn on the surface of this building. The stones which is uses, the other features, other decorative elements which is uses they are all sourced from different places of India and it has a one unit of, one museum of this kind of it is unit kind. It represents several rich vernacular traditions and heritage, architectural heritage of different parts of the country at one place.

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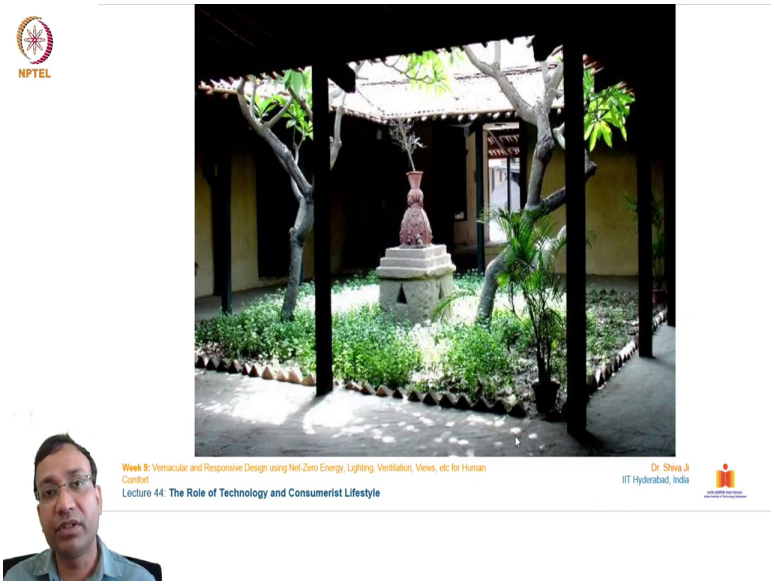

So, I would suggest you must take a visit whenever you are reaching city of the New Delhi, because you will get from an architect's or engineer's and designer's perspective how humane this place is and how humane the materials used in the buildings could be and how humane the overall approach could be towards living in the sync with the nature. So, that is idea which you will realize after looking at this building.

So, as you can see in this picture, it is courtyard, it is a typical courtyard arrangement which is given over here. So, this, in this you can see like there is courtyard plant on the inner side of this building and there are trees and there is one *Tulsi* plant also planted over here and the entrance

door on the one side and other rooms on the sides they have their own respective like door and the windows of these doors. They open inside the courtyard.

They may be having other windows also on the opposite side or may be opening in the other side of the building. So, this if you see it is nothing much, but it is a very settle architectural system integrated over here of ventilation and shading from sun and rain. So, why these covered pathways in these corridors to protect from direct sunlight and maybe direct rain.

So, it is very typical, if you see, like so from where it could belong to. Obviously, this belongs to most parts of the India, because India, in general, is warm and humid and subtropical country. So, this is the characteristic of India as is like one geographical entity. And this is the one architectural system which follows in the length and breadth of India starting from northern gigantic plains, still the courtyard houses of Tamil Nadu and Kerala, even in the middle of the India, on the west side India and on the east side of the India. So, we can say this courtyard planning is a very typical a feature of vernacular architecture from India. There may be some further details which vary from region to region.

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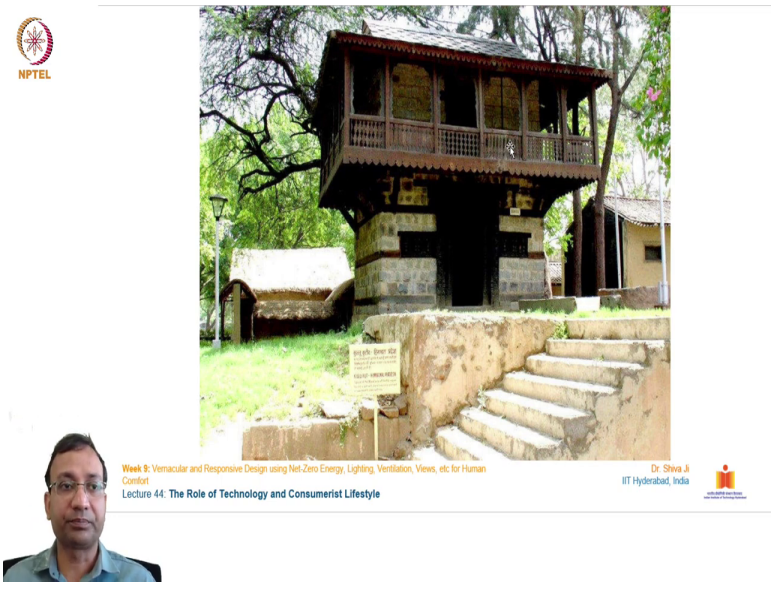

So, in this slide if you see, this is typical architectural piece from Himachal Pradesh. So, it utilizes these stone blocks for creating the main wall and on top of that there is wood or timber constructed this house which is lies again this pitched roofing over here with the tiles in order to

slide over the snow which falls in the winter times. So, this is a typical structure from Himachal Pradesh.

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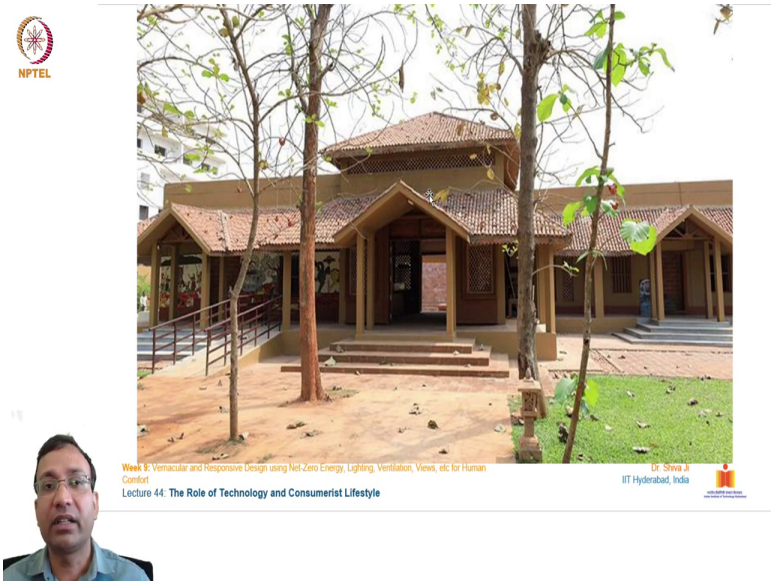

Similarly, you can see this building over here. It is a new adaptation of the older vernacular architectural system utilizing a combination of the new with the older traditions and here you can see these pitched roofs again for the purpose of this draining of water and snow and you can see the *jalis* over here at the top of this building. So, this is for, mainly for enabling ventilation in the main part of this building over here. So, that the warm air which rises within the space may continue with the moment they are from one side to the other side and allowing the fresh air, allowing the cooler air to come inside and the stale air to go outside.

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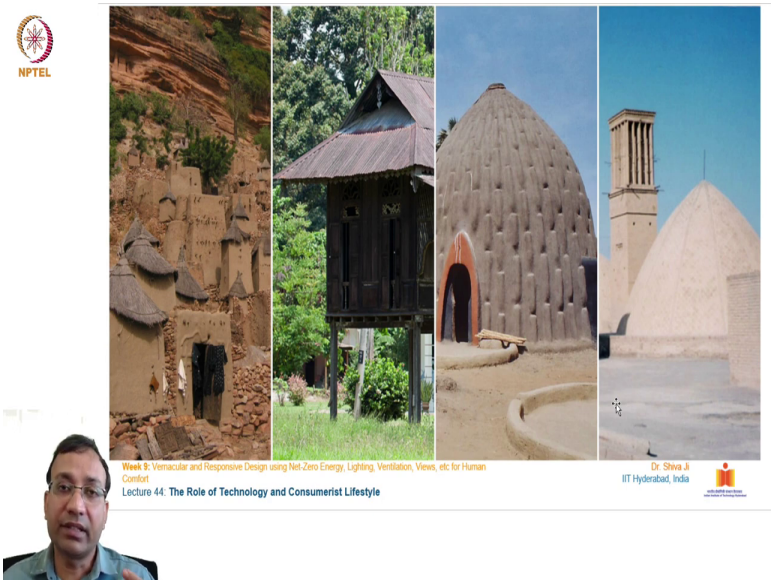

Some more examples you can see from across the world. These structures if you see from the, whether we see they are like a geometrical form or we see they are like the material or the texture or the appearance or the detailing. So, they feel like they have evolved in that particular sign as you can see the first picture on the left side. So, there is a hilly area with the stone in abundance.

So, this structure uses stone. On top of that, it is layered with the mud and it has thatched roofs, this conical roof to allow water to seep out easily. So, you can see it follows the topography of the land also. There is no manmade cut made in the foothill of this particular hill over here. But in the recent times it is a very rampant practice to cut the hills in L shape and clear out the land which leads to further destabilization of the stone on the upper sides and as a resultant there are several landslides' activities promoted by this human activity.

So, how beautifully this piece of architecture fits into this place. It looks like a piece from fairyland or a wonderland how these are architectural system have evolved with the small, small detailing's you can see like a bamboo and timber pieces are coming out. So, these are the structural members used inside the houses to create missing flow or roofing and other structures, the roof supporting structures.

And even you can see on the front surfaces of these walls there are some figurine with some stucco work which talks about a representation of that particular tribe maybe the social strata of

it or something or maybe a name or something like that. So, how beautifully it is integrated in the same material without bringing in other third material.

Similarly, in the second picture you can see this also follows this stilled construction system in raising the entire habitation area as high as like a 8 to 9 feet over here from the ground floor, so from the ground surface. So, it is very evident that there may be some climatic, impacts or something on this area maybe flooding or maybe water logging at some point of the year and to safeguard or maybe even some regions, for example, a storage for the cattle or maybe a shed for the cattle or maybe a keeping some other utility rend stuff on the ground level or maybe this land falls in some maybe forest areas infesting lot of with the reptiles and other such creatures to allow them a free moment and safeguard the family quarters. This structure is stilted.

So, such examples we can find in plenty for like our own Northeast India, where some states, for example, like Meghalaya, Assam and then Nagaland they use such stilt structures. Because Assam and you mostly aware of this *Kaziranga* National Park so if you go to that area this, that area receive a huge amount of flooding and waters from the river Brahmaputra for several months every year almost at the time of the monsoons.

So, this kind of architecture allows water to flow naturally without causing the much damage to the structure, because these are the only columns which are coming in the way of the water, not the entire structure, because if the entire structure comes, there will be a bigger and wider surface area in resisting the water, thus the gush of the water and water in the Brahmaputra flows in a very high quantity.

Brahmaputra, you may be knowing, is the largest and biggest river in terms of carrying the volume of the water per second. So, it creates lot of havoc every year. So, such kind of solutions are very, very rooted to that place as you can see over here. These two structures from the right side you can see like they are these conical spherical, like a conical spherical combination they are created over here.

And it is clearly visible on the right most side this is structure, this is the wind chamber actually. So, obviously, it is very evident that these two structures are from some dry area from some part of the world. So, we can easily guess through the features which are there in the structures, like a

this is a thick wall without any opening so this must be from very hot dry place, maybe some gulf country or somewhere.

So, this is very, very evident. So, we, I need not name the place, but you can easily you should be able to guess from the features from it like from where they should belong to. So, generally, we can understand through this geographical like such characteristics, such features which represents some responsiveness from, through this design for that particular geographical area.

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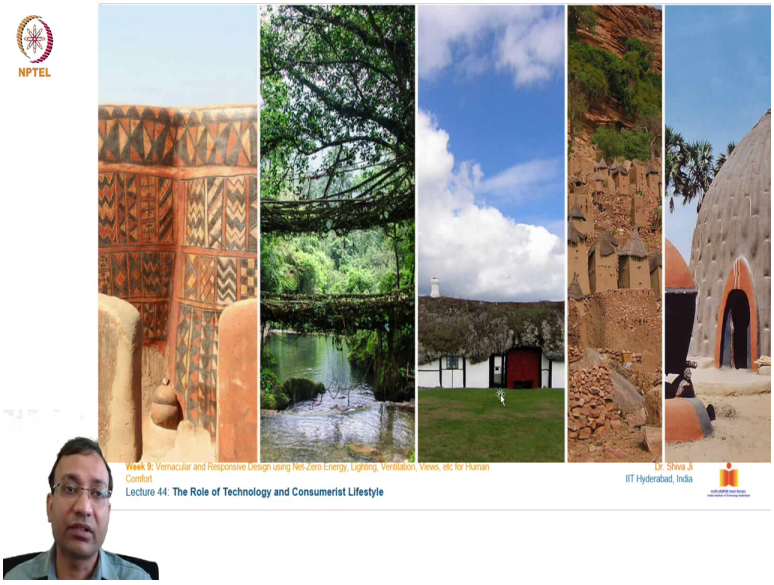

So, further down here you can see, it is not just the building material, it is not just the form, size and scale, it is the making it very, very intrinsic to the overall value system and the society and the community lives. So, you can see some figurings also here, some you can see patterns, some drawings on the walls. What do they mean, it may actually vary from tribe to tribe.

So, these patterns they belong to a particular tribe and these, the arrangements of these lines and the way they, the thicknesses what they adopt and the color combinations what you are saying it looks piece of a cloth or something it is taken from, but not. This geographic maybe representing a particular tribe or maybe social status of that particular family or maybe their identification mark through which these, any portion from that tribe may easily decipher and understand which this structure with whom, with which person it belongs to, with family it belongs to. So, it has such coded pieces of information also through this architecture, so that is why this architecture is very, very rooted to the place, very, very rooted to the community.

The second picture you can see, it is not a piece of building, but it is a piece of a human ingenuity and creation where they have used these natural roots of certain creepers and very strong creepers who have strength in their members or tensile strength. They have used it to weave as a bridge, as a cross over for this crossing this water stream which is flowing right here in the lower side you can see.

And it is not just one level it is two tier root bridge from the state of Meghalaya in Northeast India. So, this is a very, very unique system like how nature can itself be used to maneuver without harming and they could have used pieces of maybe timber over here or maybe steel over here to erect a maybe foot over bridge or something like that, but no they have decided not to bring any other foreign material and utilize whatever they could on that given place.

So, it is an excellent piece of human ingenuity and creativity, while maintaining the balance, while maintaining the coherence with natures. So, vernacular architecture represents that cohesiveness, that coherence to go along with the nature, not against it. So, that is the most important essence from this lecture I would like to deliver to you.

So, why vernacular architecture is important in the strategies for sustainable design in this course? Why, because vernacular architecture gives us a plenty of examples what to use and what not to use. So, we can see what kind of forms they have used, what kind of materials they have used, how they have maneuvered their design and construction in any given that location and the resources which are available at that particular place.

So, it is a wonderful piece of architecture to witness from across the word and you need to opens our eyes like we as like a trained architects and designers and engineers how we are contributing by going against the nature. So, the essence of this lecture is in this feeling to understand a going along the nature.

You see this third picture. See, the roofing is looks like a piece of maybe a grassland or maybe a stony area where some lichens and grasses have grown up and this is precisely what it is. You are not wrong. You are absolutely right. This actually, this roofing what you all seeing is a combination of thatch and straws on which lichen and moths and this green stuff they have grown up and this is what we were discussing in the chapter of urban heat Island, in fact, UHI, where the whole idea was to minimize the heat quotient of that particular building and in the

whole the entire community in that neighborhood. So, this is traditional way of utilizing this green roofing structure which is clearly seen over here.

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In some recent times you may be, you may have seen some keen architects and engineers they have designed such structures which utilize adobe-based material, like adobe itself is an excellent material which resist the heat transfer, which resist even like the other forms of radiation and things. It protects the interior from outside. So, you see this building on the top right side.

So, this building does not utilize concert system, but it uses such bricks and mostly it uses this natural material you can see over here these stone blocks uneven to create it is like these wall surfaces and it is G plus 2 high structure which an adobe structure or a brick structure can easily withstand without any complication and utilizes these screens, these jail systems also to promote ventilation and the passage of light in a controlled manner to the inside.

These, all of these images, as you see in the recent times this building was constructed using the, there is a courtyard system of this vernacular architectural system which we discussed in the initial slides. So, it utilizes the same philosophy over here of creating corridor and courtyards inside and this is shaded portions where one can sit and relax in the hot and warm and humid atmosphere.

So, these kinds of buildings around also coming up in the recent times, but the number of these buildings are very few extremely like a rare, actually somebody goes for such construction of

system, but we must promote. If not necessarily if it is not possible to go with the pure adobe structures but at least we can promote like an amalgamation of both philosophies of modern construction methods and the vernacular architectural systems.

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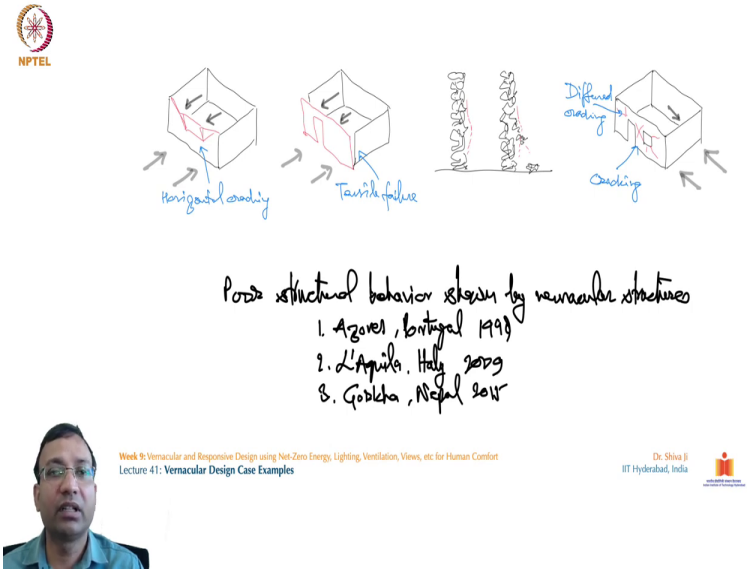

Well, vernacular architectural system has some challenges also like it poses from time to time. So, you can see this figure over here on the top left first picture if you see how the earthquake kind of situation may impact such buildings. So, this is one of the examples. So, this study is very important for us to understand and reengineer our approach while designing a building which utilizes a vernacular architectural system.

So, how we can strengthen the walling you can see over here on the first picture, first sketch on the left side. The second one with the example with the real life of picture from Nepal you can see over here. It happened in 2015 with the earthquake which happened at that time. So, how the entire wall surface got detached from the rest of the wall of the building.

In the third picture, you can see how this stonemasonry failed from one portion. And the last one like how this rupture happened and this crack got developed at the corners of these openings of windows and doors. So, this is important for us to understand well the vernacular architectural systems do not use metal all concrete as their primary material. So, how these still can be reinforced can be rectified for saving from failure in such scenarios.

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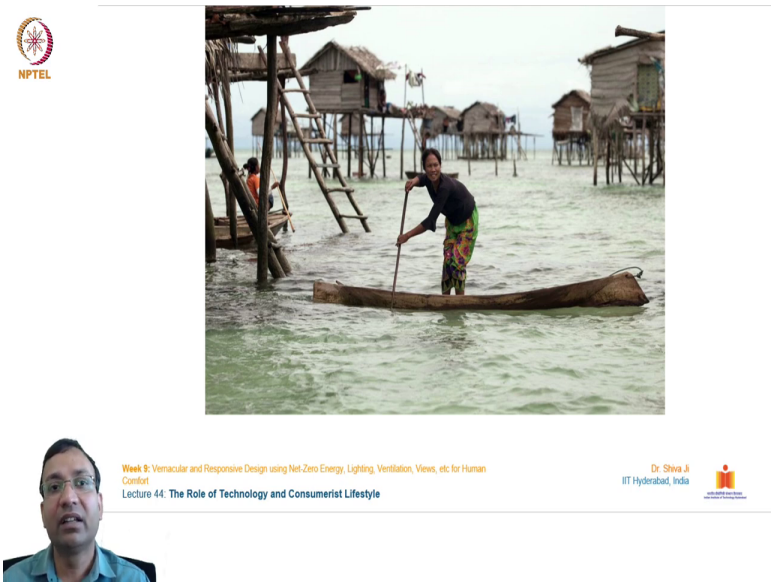

Some extreme examples of vernacular architectural systems from across the world, you can Google these images. This picture looks like a piece of fancy or maybe it looks maybe a extreme truism, but it is you are seeing, what you are seeing is the neighborhood with exist on the water body. So, these families, these peoples, this lady you are seeing over here, it is there like a dailies activity to pass through this water which is flowing right beneath their houses.

So, they have learned to live along with the water. This is a picture from Philippines and Vietnam area. So, from there this picture was sourced and it shows not humans, not just can live on the like a ground itself, but they can live in a water also, but like up to certain extent how they can survive. So, this water is not just providing them a shelter, but offers them a food also, it provide them some occupation also. So, this water is very integrated with their everyday life.

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The next example is the very famous picture. You may have seen it. I would not name the country. You can search for it yourself and you try deciphering the kind of architectural system the vernacular architectural system. This country have is the very rich in such presentation. So, you can see this is, this entire structure is built in mud walls, utilizing rafters of timber and there are very small opening with the thick walls you can see over this thickness, the thickness of these walls on along the sides of these windows.

So, obviously, this belongs to a very hot area, one of the hottest areas on the planet. So, this country, this architecture belongs to that particular country. And economically also this country has not evolved, so much, has not done like a much compared to the other countries who have developed very fast. So, because economics also has a direct correlation with the evolution of architectural and structures.

So, how even by being in like a such a limitation of like a situation. How this place, how this community has done wonderfully to evolve such a pleasing architectural system. It is worth looking at and it gives several details how people use to live.

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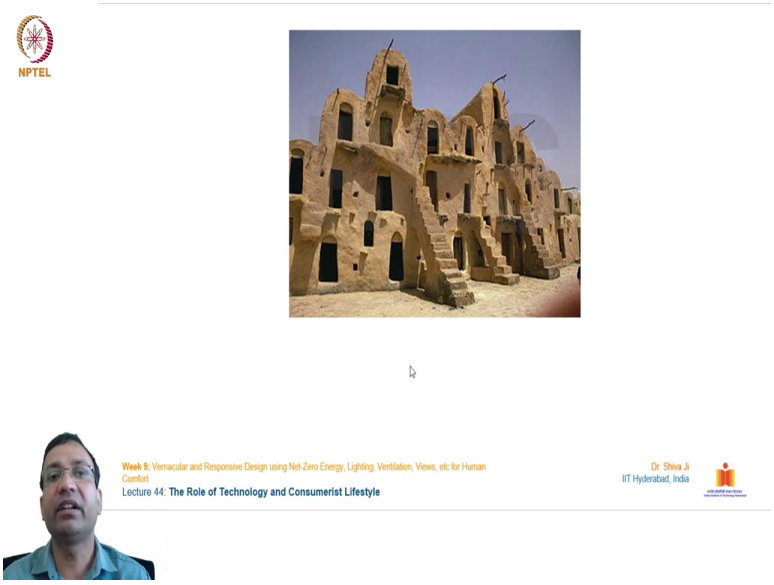

So, we have another example you can see over here. It looks like a may be borrow kind of where the wasps and other animals or may be small creatures and things would live, but this is not actually, it belongs to humans our like a few generation earlier like ancestors they have lived in these structures, where you can see a number of opening. So, this is curved, actually it is a rock cut architecture, an excellent piece of rock cut architecture where the community has a dug deeper within a bigger block of like stone and they have created a habitable space.

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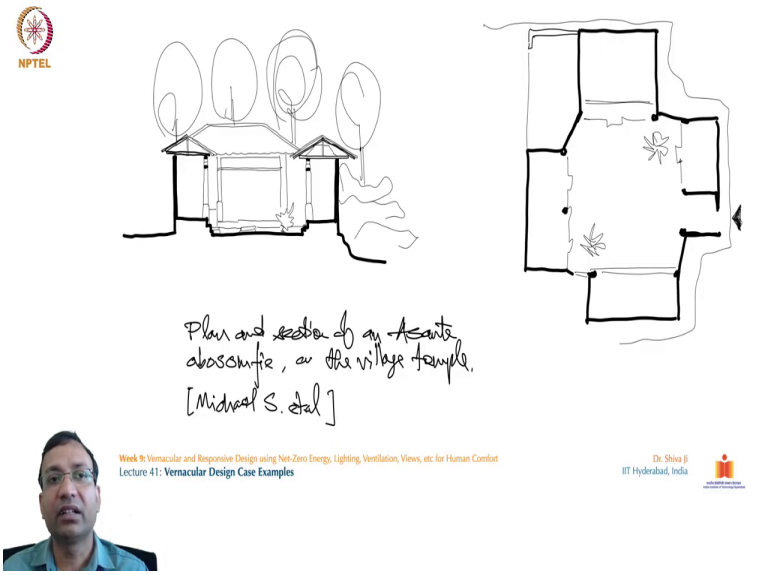

Moving on you can see one arrangement over here in which it talks about having a courtyard in the center and then other habitation spaces on slides. So, this is shown over family belongs to music and how they have created their chambers and their sides, on the sides of this structure over here. So, you can see a drum room on this side, single sitting on this side and may be shrine room over here, some visitors over here with and these are all spaces woven around this courtyard, the central courtyard and in section of you can see over here. So, this utilizes even can let a create ambience actually of like a living as well as musical activities and other sorts of activities also. How architecture is rooted with the other value systems of our society also is a very evident from this place. So, this architecture shows, gives us a glimpse of that kind of uses.

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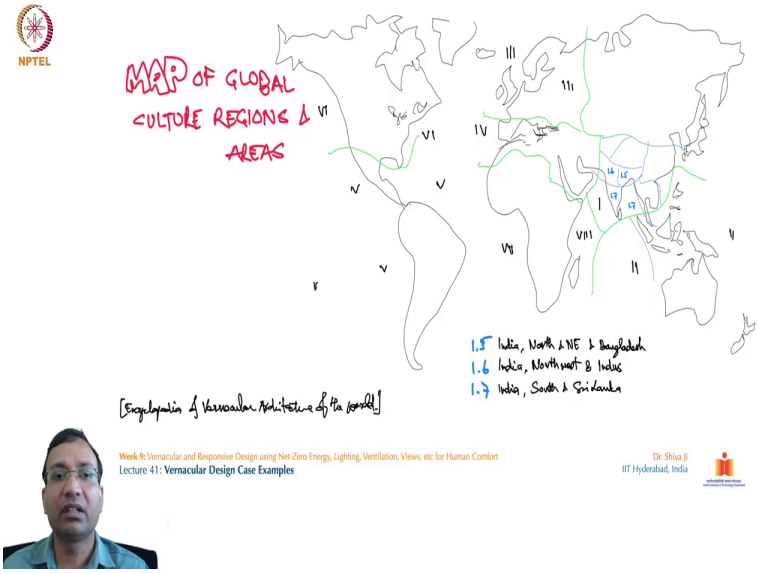

Well, this is a map. So, this talks about lengths. It is from encyclopedia of vernacular architectural of the world. So, this map has divided in the regions of the world which have a one similar kind of vernacular architectural system. So, in the subcontinent of India you can see over here this falls under 1.6, 1.5, 1.7. So, these are the subtropical warm and humid areas, the arid areas, again forest subtropical areas.

So, this is divided majorly into like India is divided majorly into three parts and this is very evident. Once can actually understand for if you study the regional vernacular architectural systems of India. And the other countries also you can see how they are divided and we can see

the details over here. So, this map is sourced from like that encyclopedia which gives a beautiful examples of architectural system from these many vernacular divisions of the world.

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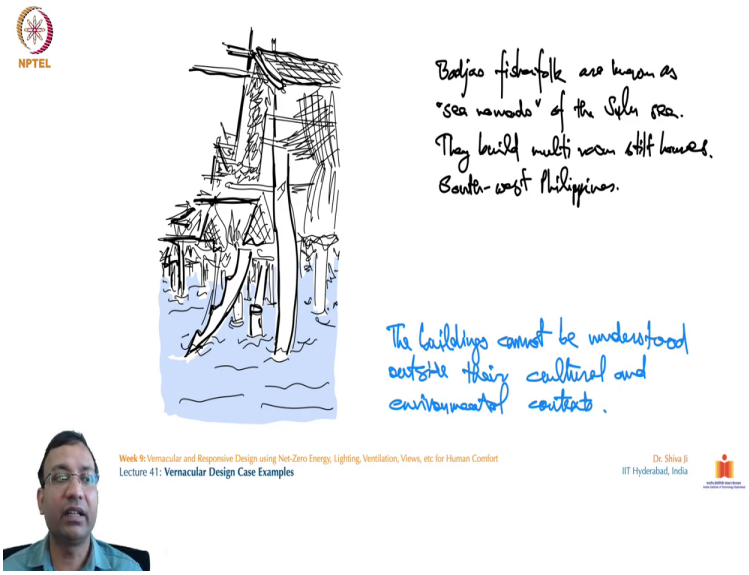

Here another example which I have shown earlier. You see how beautiful they have used these a log of wood to create steps kind of a ladder to rise from these waters and reach the houses on the top. So, this building cannot be understood outside their cultural as well as their environmental contacts. A fact which raises the issue of the who of the vernacular architecture. So, you can see over here, a building is very, very rooted with the environment of course and the context and is very, very rooted with the culture also. So, the culture is the driver, driving force which gives the details and the other features of any architectural system.

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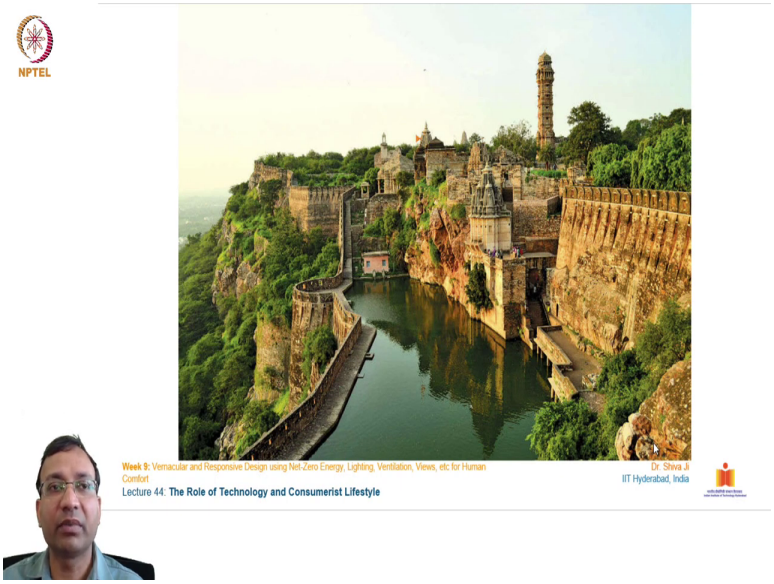

In the next slide here, you can see this is example taken from state of in Rajasthan in India. And this particular place is known as Chittorgarh Fort you may be aware of or you may have seen this *stambh*. This is a *stambh* in the commemoration of the victory and you see this fort over here. This is sitting on the top of a hill and it has this amazing this water pound also over here which harnesses which replenishes from the water received from the in the monsoon months, in the rainy seasons and it stores it for the utilization over here.

And you can see a temple is here and some more quarters are here created at the surface level of the water flow for bathing and other activities for sourcing water. You can see these steps are going down from here. And there is an arrangement actually have this waling system. So, this is an amazing piece of architecture you can see on the fort construction from these ancient times.

So, you see the cross section of wall is almost visible over here how this wall is working as a retaining structure. And it is holding water without leakage or without any problem for several centuries now. So, it is an amazing piece of vernacular system without utilizing the harsher materials and harsher techniques and other things. So, this is a very, very unique architectural, Rajputana architectural system from this place you can see.

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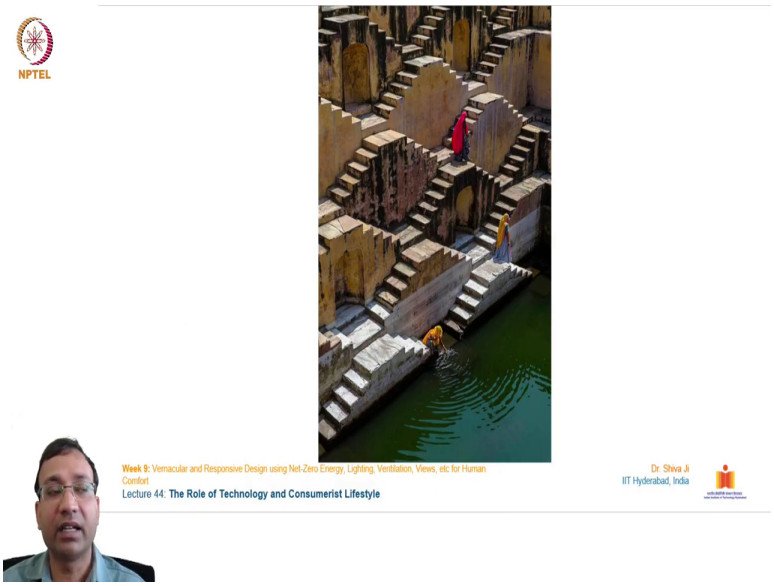

And another piece of wonderful architecture is these step wells. You may have seen some images or you may have been to one of these *baolis*, they are called *baolis*, so they retain water for the summer months when Rajasthan experiences immense heat and arid climate. So, in these months anybody can walk down. So, this, see the arrangements of these, scissor arrangement of these steps.

So, that to create a deep turf over here which retains water without much the evaporation and all. So, this, sometimes these wells are as deep as like 100 feet and even more. So, there is one famous *baoli* this Adalaj in the next to Ahmedabad city. So, that is one of the very famous examples. You can see how the daily activities are being carried out by these women and they are easily a getting down and they are able to fetch water from here.

So, Rajasthan I have been traditionally very dry and arid state. And in the summer months it gets purged and the severe faces like a severe scarcity of water. And even in that like how the communities have evolved ways to deal with it, how they have evolved techniques to deal with it and how they have developed this vernacular architectural system is one of the eye-opening images for like a, as far as the understanding is there of vernacular architectural systems.

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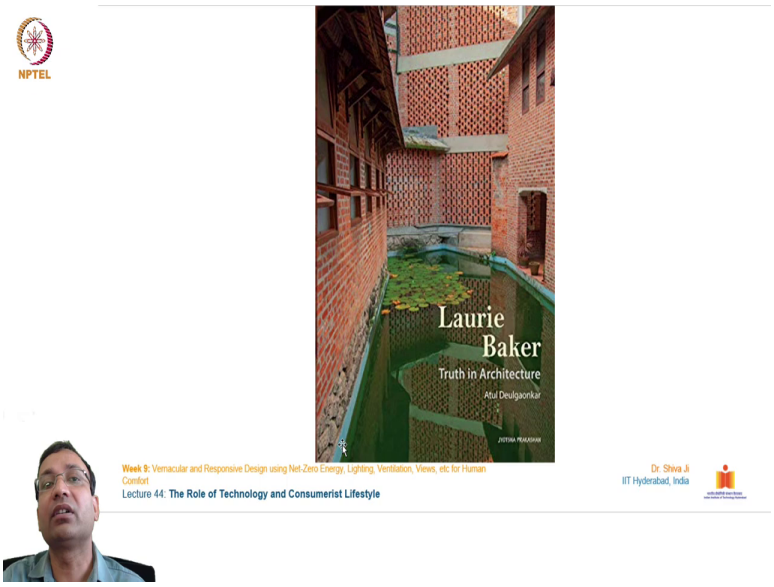

So, now, I would like to give you some examples in the recent times how vernacularity was adopted by some very famous down to earth architects who they have lived in a very Gandhian philosophy, very down to earth person in their perspective in their daily life and how that philosophy has reflected even in their architectural systems. So, this is you may be aware of this name architect Laurie Baker.

Well, he is no more now, but he has lived and he has kind of spent his life in India and all of his architectural designs they are very, very rooted to the place, very, very rooted to the traditions, how to deal with the sun, how to deal with the wind, how to deal with the humidity of that place and they have evolved a wonderful pieces architecture. So, you can see over here in this building, so this entire a wall is made up of like a brick.

And you can see over this brick is layered in a jail function, allowing wind moment inside the quarters and with the presence of this water body over here, certainly this water body is going to add to the cool breeze, it is going to add to the minimizing, lowering the temperature of the prevailing wind and this premise.

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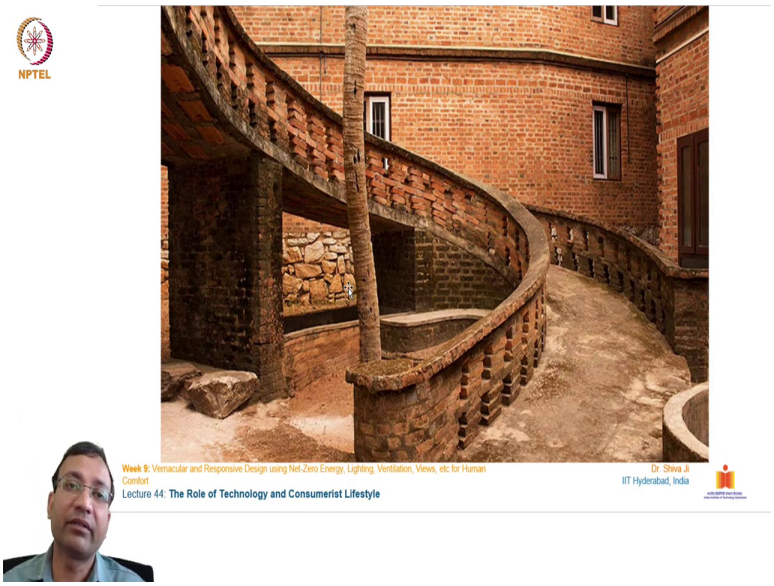

Another picture from his one of the projects so you can see like how he has created even ramps using nothing much, but these brick jail structures and a piece of concrete over here for this creating this slab and even at the bottom you can see there are a brick pieces laid even in the flooring of this material over here. So, you can see how he has arranged the stone blocks in the lower areas or even foundations to utilized the local resources and minimize the uses of factory-made structures or a factory made building components.

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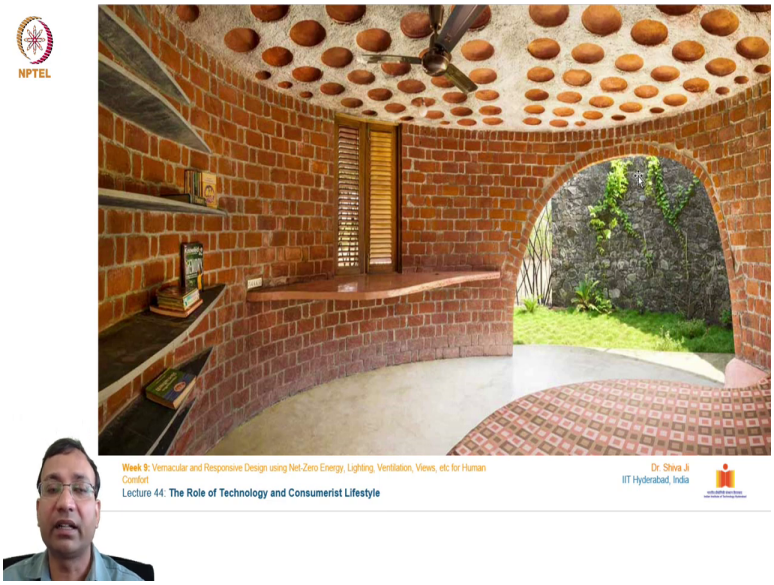

Some more examples of how wide span roofing also can create out of such vernacular architectural systems, how the wider openings can created by these arched brick formations and how the shelves, see the each and every detail, each and every component of this building. Even if you see this treatment in the ceiling, it is not just a piece of aesthetics, but it works as a structural member giving strength to this entire roofing systems and eventually working as smaller, smaller components and smaller, smaller beams constituting into the entire this roofing system.

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Further you can see over here, it is not just the brick only like how the bamboo can be utilized for creating a suns screen of the building. So, one beautiful example I found here with this picture. So, how these windows and other building surfaces, which are attentively exposed to the sun they are covered in this bamboo pieces and these bamboo pieces are also arranged is very pleasing to look at and they are actually becoming a part of this building. In whole sense this is not just like external treatment or something given as aphasia, but it works as integral member of this building.

So, this bamboo utilized even the formation of these windows systems over here and the other framing system also over here. At this portion which is the completely exposed brick it appears to be the staircase block and that is why these bamboos not covered on this, but it follows some like a brick jali structures over here to allow like a light and ventilation inside.

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This you may be aware of. This is in the city of Trivandrum in Kerala. So, this is the Indian coffee house building which is designed, which is existing busy place in the city and this is situated right next to may be moment area where is a bus station or social activities. And this building you can see is very unique. Its approach, it appears this is building which is forming through a helical structure. So, this is how this was designed and executed. And you see these triangle openings to allow a passage of light and ventilation in this a humid place such as a like a Trivandrum.

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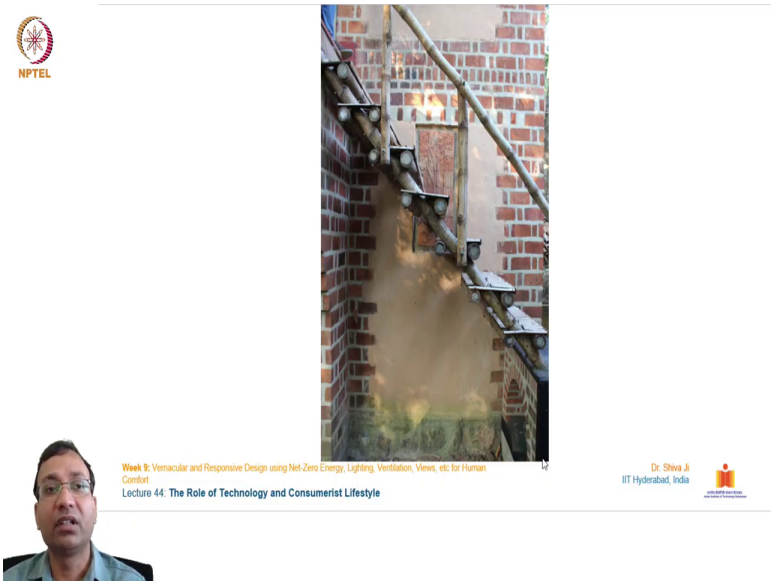

Further, you see how this bamboo is fashioned to create this staircase. So, usually we see ladders in bamboo but this is a staircase you can see made out of bamboo. So, a building made up of a brick mud, treatment and bamboo, well if we compare it with our LCA exercise, so the sources of this material is the nature only and very little intervention little processing as done with this mud, these materials and months their lifetime is over.

Well, they are not going to lie down somewhere and waiting for 1,000 years to decay and decompose. They can easily go back to nature and become part of some other thing again in a very short span of time. So, this is the actually that factor of time in the biodegradability, because in principle everything is biodegradable even if it takes 50,000 years to decompose and decay, but that time factor is very important. How long it is going to take to get decay and decompose without leaving any hazardous effluents. So, this is one of the amazing pieces of how thought process can be utilizes to create such structures.

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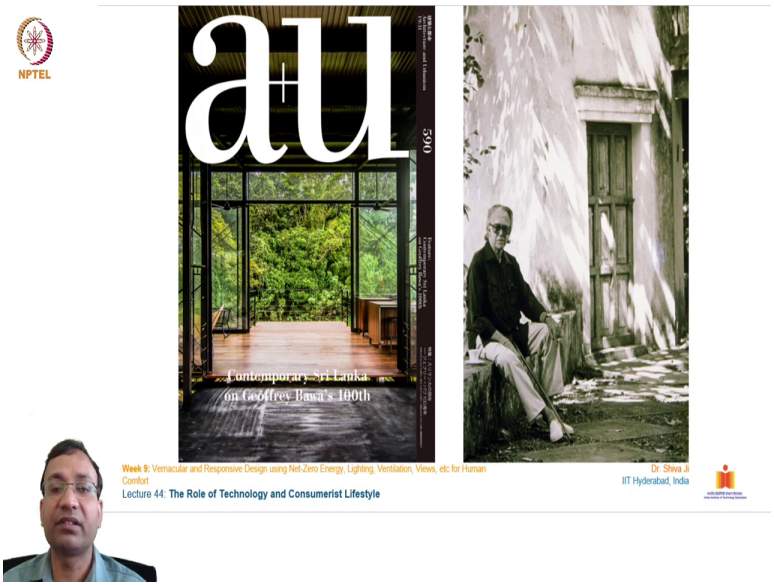

Another example I have taken from an architect from Sri Lanka. He is an architect, Geoffrey Bawa. You may have heard his name or seen his examples. He is also kind of a we can say kind of a Laurie Baker of Sri Lanka who was very Gandhian in is approach and he has utilized these vernacular architectural systems to create and design and execute several marvelous structures and which are still standing and they are landmark pieces of the philosophies, this sustainability and they represent such philosophies.

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The picture you are seeing over here is the parliament building of Sri Lanka. And you will be amazed to see this building is made up of sustainable material, the natural materials. It does not utilize extensively high impacting materials or components in its building. And this is as big as any parliament building of the world and it houses the parliament of Sri Lanka and it is sitting next to water body.

As you may be knowing Sri Lanka is a very beautiful country. It has very pleasing features, natural features and it is a scenic country. It has plenty of a water in its, if you see this, these have the actually turfs and these lakes around this building. So, it is setting, it looks like this building floating on top of this lake. And he has utilized this tradition, this pitched roofing system in executing this building and you see how the scale of these openings is getting reduced as we are going ground level to up and up. So, is a very beautiful example of this system.

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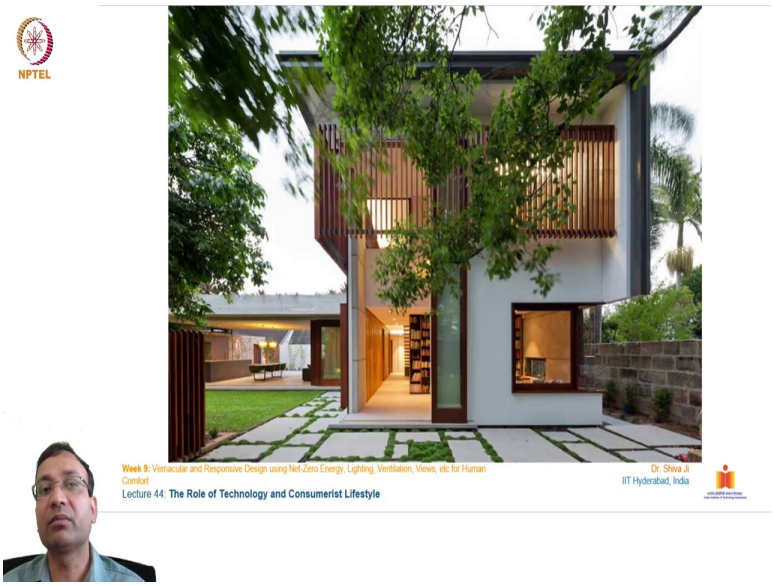

Another example in the modern times is again utilizing these fins for creating controlling the sun or even reducing the ambient temperature in the air. So, that it works as buffer areas or buffer zone to minimize and lower the temperature and then again not going very high in terms of plinth, very close to the ground level outside and with plenty of openings, with the plenty of grass and other vegetation in the surrounding definitely this place is going to be one of the most ambient places for living and working.

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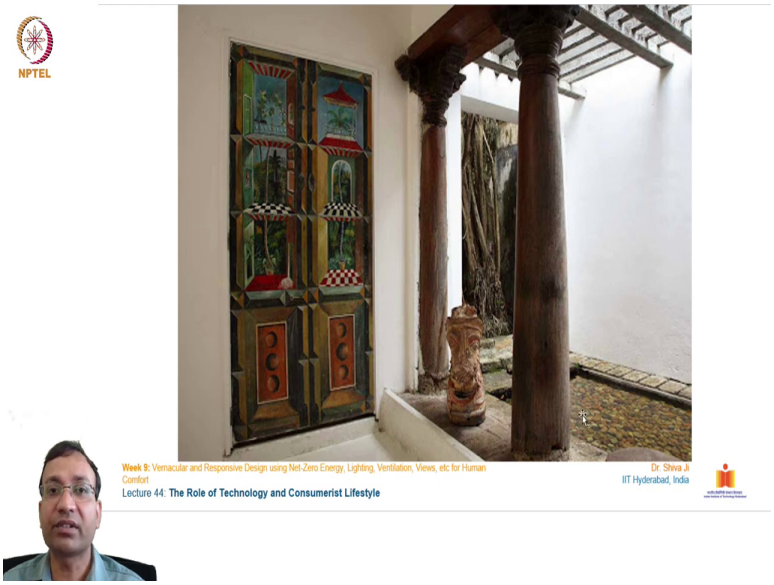

Some more examples utilizing the vernacular architectural systems of creating courtyards and others openings, other controlled openings with the pergolas and other stuff. So, you can see over here with the incorporation of even water in the interiors of this place. So, this is not just for decoration as I have said stated before, but it works as a functional piece of an element, a natural element to bring down the temperatures in the inner quarters.

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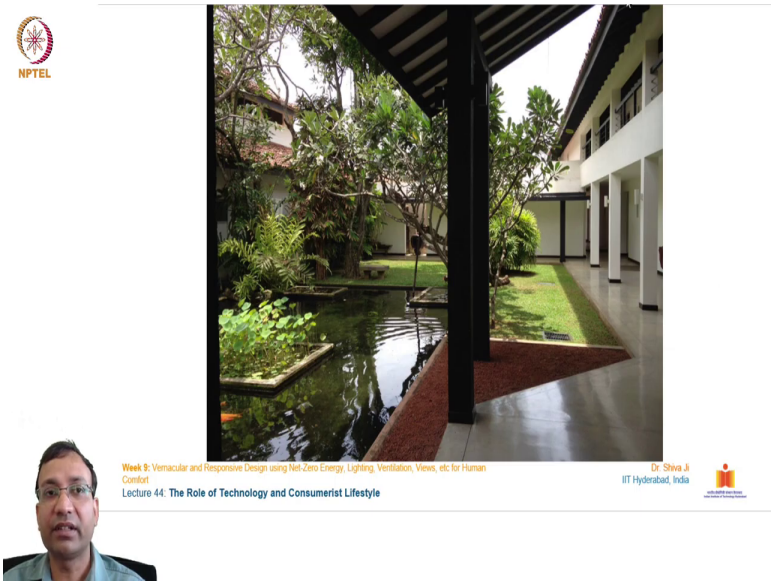

Some more images of the same philosophy in the recently constructed designs also, how the vernacular a feature can be utilized even with the, if you had the building is constructed with concrete and brick.

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This is house, actually private property you can over here the name on top. So, this was also design by Goeffrey Bawa. And it sits right on top of this water body and you see it looks like a example image from wonderland. So, how this place has utilized these fins, these *jalis* and with the glass covering at the same time it gives beautiful view of this beautiful place this waterbody, this lush green vegetation in the vicinity. So, one of the most amazing pieces of architecture we can see from the Sri Lanka which are designed by Goeffrey Bawa.

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Another the example I have taken, the last example in this lecture is of Charles Correa. Well, Charles Correa, we cannot tell him as a complete vernacular, architectural, vernacular architecture, but yes, his architecture is interpretation of his philosophy, it is very well rooted with the vernacular architectural systems. And that is why I have chosen his works and him to portray over here in this lecture.

You see this picture on the top, on the left side this is book over of very famous book Charles Correa by Kenneth Frampton. So, we can see how in his designs he has utilized the philosophy of these pergolas to create interesting interplay of shade and light in the interiors and control the temperatures, controls the glare. So, this is, this visual is from Jawahar Kala Kendra from Jaipur which he has designs.

So, you can see in this courtyard this the steps are designed in the fashion of the stipples which we saw from Rajasthan. So, in the same philosophy he has designed this courtyard, utilizing the red sands and sands stone of Rajasthan. Some more examples you can see in small thumbnails over here which he has designed over the years. So, several such examples you can see from here like this is the Gandhi Museum from Sabarmati Ashram. So, how he has designed the courtyards and how he is planted trees, what is the scale of it. So, they are all actually beautiful examples of adoption in the recent time.

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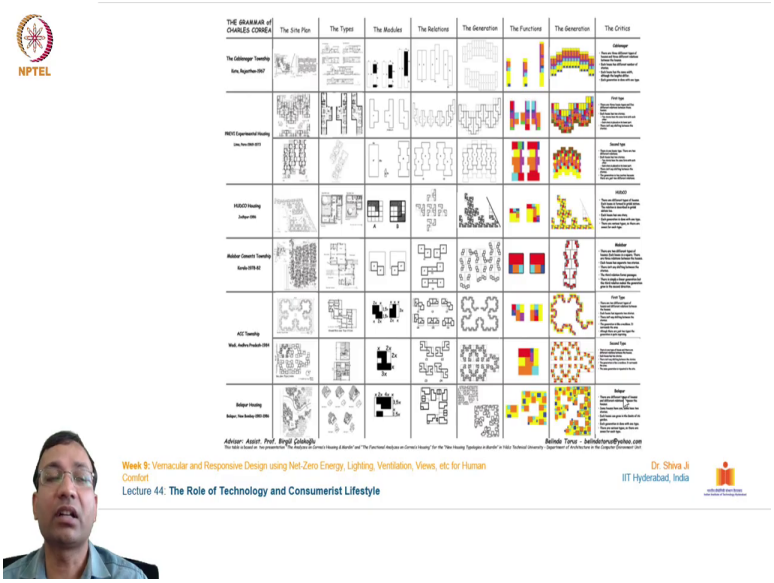

So, we will see grammar of Charles Correa. How he has followed this grammar was the philosophy. So, you can see on the how he has handle site plans. There were several examples given over here on the, on this column. You can see starting from like it has HUDCO housing plan, it has Malabar Cement Townships, several ACC townships, so how he handles the site plan for the planning of the housing and the row housing. So, this is given over here.

The kind of types what he has used in his designs over here in these projects. So, the unit habitations are detailed over here. You can see the very famous Bela housing at the bottom. In the next column you can see the unit modules, how he has designed these unique modules of these projects and how these modules are in relationship with each other, what is the kind of a staggering he has used, what is the kind of the arrangement he has utilized. Somewhere they are at some angles, somewhere they are at sitting at 90 degrees, somewhere they are little bit placed and creating interesting space or courtyard may be in the front. So, this is the kind of the arrangement he has played to create interesting spaces.

And a bigger group like how he has utilized this generation approach of the multiplication, how these entire units in a collective way they are going to be have creating interesting interactive spaces for this community, some working spaces, some spaces for celebrations festivals et cetera. So, and then the functions like what are the functional areas of these units and where they are placed. So, we can see a very beautifully laid this by the assistant professor over here. He has beautifully laid this grammar of Charles Correa's designs.

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So, in one of his very acclaimed projects this is the city center project from the city of Kolkata. So, this was designed by him. So, you can see how he has created brought those natural elements from the vernacular architectural systems. How he has used the wider openings, how he has used pergolas and semi-shaded areas here on the in this part and how the different activities they have, actually he has colored in the different colors altogether, very striking, very appealing, very, very strong colors. So, this is one the claimed projects of his designed.

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And in the planning also you can see how he has worked on the grid and how he has kind of a created this interplay of different activities, how he has always kept kind of this courtyard planning and such philosophy in the center of his designs and there is always a tree a neem tree, banyan tree or *Peepal* tree in the center of that courtyard, bringing in the ancient philosophies of India of this courtyard planning and this community gathering along with the emphasize by the these steps arrangements for smaller performances and events something like that. So, this is the one beautiful piece of composition you can see of different elements, different functional units of this structure over here.

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Further, as I have stated earlier, this is the very famous short from the Jawaharlal Kala Kendra. So, how he has created? You see this podium is working as performance center for the, this group artists and the audience can sit on the surrounding on these steps. Laser links stretching to these grasslands and enjoying a complete open view from the top. So, this is the kind of a philosophy he has used.

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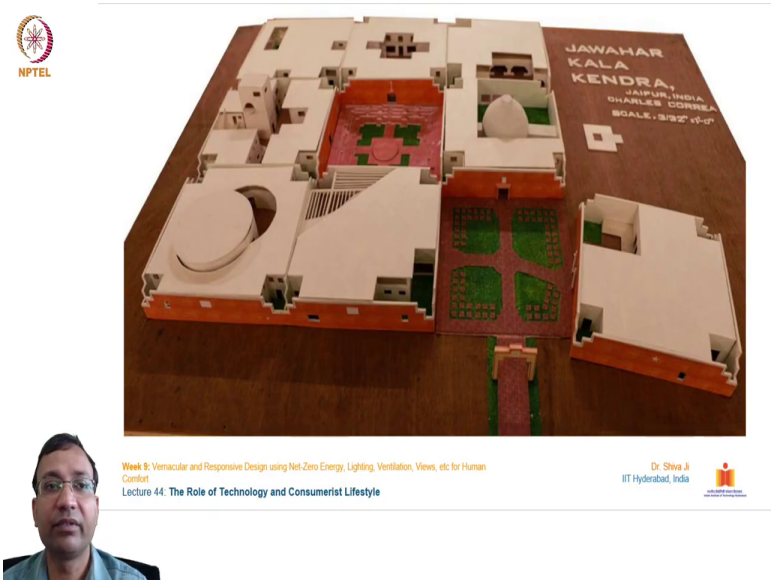

So, this is where model of this Jawaharlal Kala Kendra. You can see over here they created by this student. So, you can see the philosophy how he has created the openings and, in these squares, also how he has created these openings and he has created geometrical actually play depending upon the mandala philosophy. So, this is beautiful example of vernacular architecture.

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Another landmark example how to create interesting, interactive spaces is this project from Mumbai. So, this stands out in this entire landscape as unique architectural piece and it, the kind of the philosophy this building has, so creating a very interesting mezzanine floors, promoting exchange, promoting connection from one unit of this housing to the next unit and that is how he has kind of interconnected the balconies of two to three different housing units at one common space which is double height over here.

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So, one of the very unique approaches in his designs. So, this is some more detail of the same structure.

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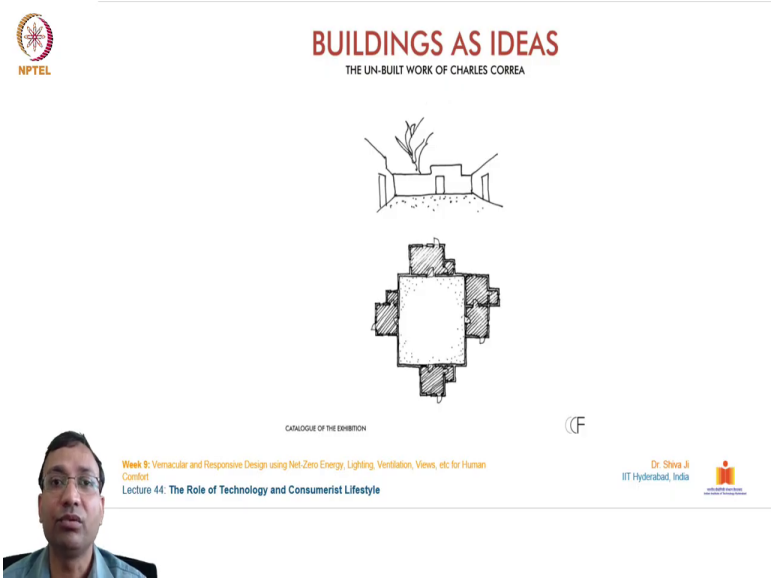

And so this is an overall since if you see vernacular architecture offers connection with the place, connection with the culture, connection with the climate and that is actually that has been the driving force for sustainable design. And this is how the communities have survived for thousands and thousands of years and this is how they have lived along with the nature.

That the philosophy we, I discussed at the beginning of my this, course, even before starting this lecture was how the humans, how our ancestors they have lived for thousands or thousands of years without getting in trouble what this modernity in the after in the post industrialized era has brought in. So, this is the only example if you see living in the sync with the nature. And for that actually this vernacular architecture is the biggest example, vernacular architecture is the actually solution of for living healthy and the nature integrated lives.

So, we must actually put vernacular architectural strategic system in our understanding in our philosophy and wherever and whenever there is any need, so you must actually employ this philosophy to go in the sync with the nature. So, with this, I would like to bring end to this lecture. Thank you, everyone.