And UNDP and CBRI and IIT Delhi and they have all been partners of technical institutions, they have already covered Assam, Chhattisgarh, Himachal, Jharkhand, Manipur Orissa, Rajasthan, Tripura, Uttar Pradesh, West Bengal so, I will just show you, I will not show you everything but I will show you one state how there; what is the pattern they have try to addressed.

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First of all, the design of the manual itself is the important thing when you are developing a guidance, for example, this is a zone A, this is how the coding is worked so now, it says UPA 01, UP is Uttar Pradesh, A is what is the zone and within the zone, you might have 2, 3 typologies, so that is where the typology number. So, for example when you say, the state name and then zone; 1, 2, 3, 4, 5, like that.

So, this could be done by ABCDE zone and then within the zone, you have 1, 2, 3, 4 typology, this is how it has been organized and how one can read this document.

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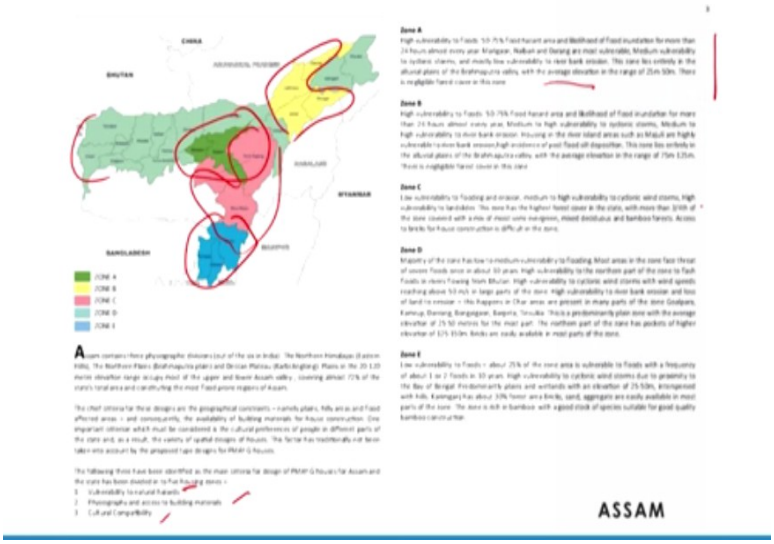

I will show you one example of it, for example, you take the Assam state where you have the zone A is here and the zone B okay and the zone C which is towards the Bangladesh and the Manipur side of it and you have the zone D and zone E, so this is how and they are all classified by vulnerability to natural hazards, physiographic and access to building materials and the cultural compatibility.

So, here, they have even described what actually this zone A comprises of in the high vulnerability especially to floods and what kind of floods they are talking about, what kind of riverbank erosions, they are talking about and you know, it is also talking about what kind of elevations and the forest cover, so that's how the descriptions of each zone has been given.

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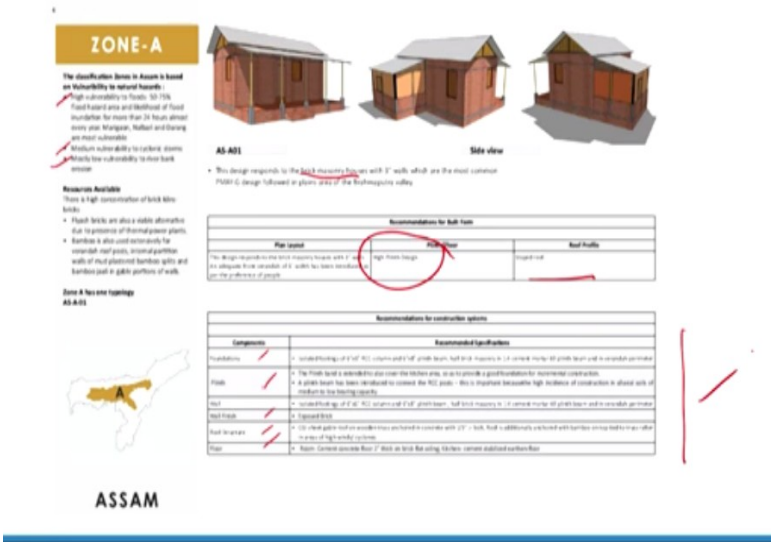

Then in the zone A, where we talk about, here, this is the zone A and it is based on the high vulnerability and medium vulnerability cyclonic storms and mostly, low vulnerability riverbank erosion, so here, this particular typology, this is a typology of a house where they try to document it and this response to brick masonry houses with three-inch walls which are most common.

And because it is an effort how one can validate these rural housing typology which are already existing you know, so how structurally one can validate how, so that earlier whatever the rural technology exists, they try to ignore it and they try to give their own uniform and standardized solution but this is an effort, how we can bring that local character still and how we can validate those techniques.

Now, it says about the plinth; the high plinth design and a sloped roof, it also talks about the foundations and the wall, wall finish, plain roof structure and the floor and it's all talking about the recommended specifications of it.

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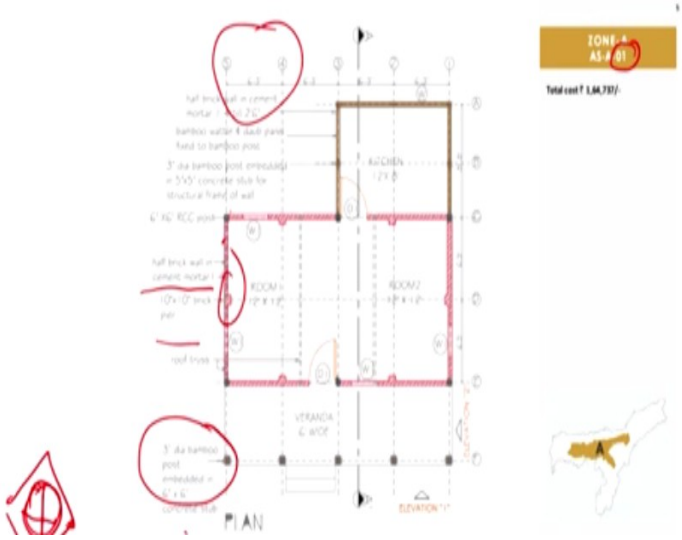

Then, a typical dwelling unit like this is a zero-one, this is one typology and you can even think about you know, the how the basic dimensions, which are existing and how one can actually understand that 6 foot 3 inches because the span between 6 foot 3 inches and that is how a framed structure could be also thought of and here, you can see the half brick wall in cement mortar is 1:4.

And whereas, if it is a brick pier; 10 inches by 10 inches brick pier and for each this is a 6 feet 3 inches span you are getting and also 3 inch diameter, bamboo post embedded in concrete slab so, basically, you have the concrete and then this is a bamboo post which has been embedded with it that acts like a reinforcement so, this is a basic understanding of the plan forms of it.

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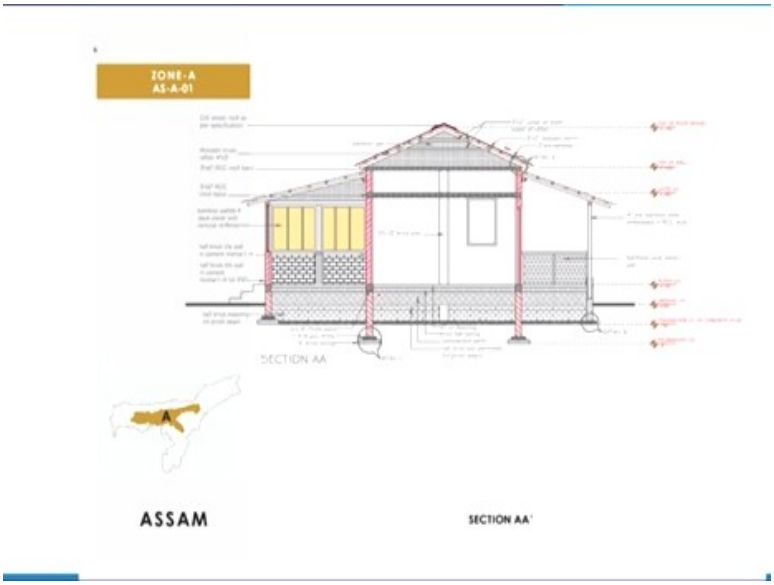

And then, it goes back to the heights and you know, the material components in it so, how the wooden purlins works, how the collar beam works you know so, how the brick foundations you know, how they have to so, it gives the more technical details of how one can construct in this format.

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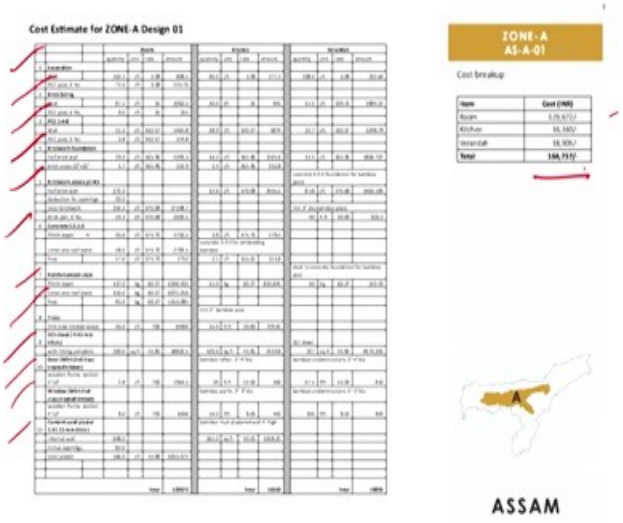

Then, comes to the cost estimate, you know the cost estimate for zone A, design one so, when we talk about cost estimate, it covers excavation, brick soiling, PCC, brickwork foundation, brickwork about plinth, concrete, what is the ratio we are talking about 1:1.5:3 always it's a multiple of the aggregates and the reinforcement steel truss and then GCI sheet and door, window cement and plaster.

So, in that way they have been composed with you know how much it is going to cost per room, kitchen, veranda and total is this much and how do they calculate it, when you talk about this is where the integration of quantity, pricing and specification will come into the picture also, one will have to understand the labour rates of that region, if it is a Delhi area you have to talk about the list analysis of rates you know, DSRs.

And if it is a CPWD agency, then you have to analyse, that at least there are different ways how one can get these rates, whether it is a labour rate, whether it is a material rate, whether it is a steel rate, if it is one ton how much steel it is working, it is brickwork how much brickwork is costing and for this amount of brickwork, how much labour is worked out so this whole thing is a kind of a cost break up.

So that at the end you are able to come up with some kind of guidance from 1 lakh 64,000 one is able to get this kind of house, right so, in that way, this is giving you a detailed version of what to do and how we can bring these rural typologies into the mainstream practice.

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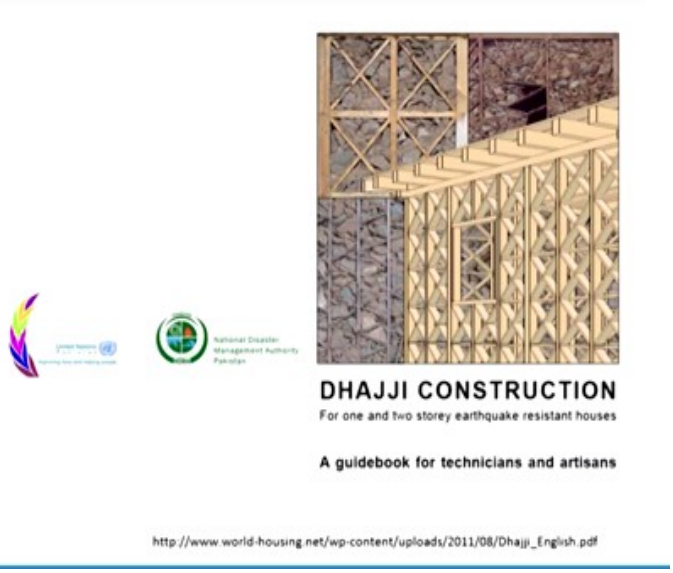

Similarly, there are efforts in Pakistan in countries like Pakistan, there have been a guidebook for technicians and artisans, they call it as artisans. Like in India, also in Himachal and as well as in Uttarakhand, we have the Dhajji wall constructions where it can go of the one and two storey earthquake-resistant houses, where you have the timber frames and the embedded whether it is a stone embedded, whether it is cobbles or pebbles, whether is a flint filling it so, they have developed the technical manuals of doing this Dhajji constructions.

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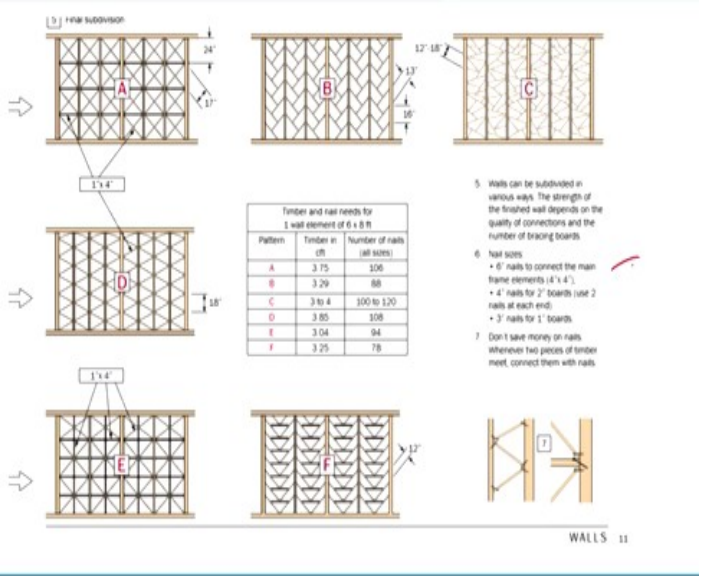

And also, the retaining walls if you are constructing in these hilly areas, what are the methods one has to approach in constructing the retaining walls and especially how, what are the principles we apply in subdividing these Dhajji wall constructions because there is a timber studs and which are embedded within the stone gabions sort of thing or it could be mud-plastered as well.

So, this is where they even talk about the nail sizes, they even talk about the spacings to it you know and now, here 1 inch by 4 inch you know, there even talking about the length of studs, the dimensions of the studs, the volume of the squares you know now, some of the technical details which has been given some guidance to these local carpenters or the artisans who are going to work on these Dhajji wall constructions.

So, I mean this is a brief about these manuals of course, there are many manuals in different, different languages but I try to show you from the Indian context and probably Pakistan I covered so, this is good enough for an architects to look into some kind of thumb rules for a low-cost housing as well and one has to understand that giving it in the local language, how this particular technical information can reach to the common man and the layman to understand it, is one of the important objective of these manuals.

I hope you are familiar with these manuals now and the guidance, thank you very much.