International Studies in Vernacular Architecture
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Lecture 19
Climate Change and Traditions

Welcome to the course International Studies in Vernacular Architecture. Today we are going to discuss about the role of traditions in the climate change scenario. So, climate change and traditions.

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When I was a student Paul Oliver has took us to an archaeological row inside in Dartmoor which are actually a prehistoric settlements, they are known as Grimspound which is from the late Bronze Age and there are about 24 stone roundhouses which are still evident from that particular site.

What you actually see here is as a big circular ring and in within which you have small circular dwelling units, there are about 24 units like that. So, though it was from the historic context we are looking at that, the very first question which came in my mind was why do such settlements perish and today how, what happened to these settlements and what are the factors that are associated to it.

So, obviously it is not only true for this particular settlement but there are many other settlements which have perished away. What were the reasons, is it only because of war or any kind of political issues or it is also something to do with the climate change? So, these are some very first questions which came in my mind. And today I am going to take you

through a kind of narrative of how the climate change scenario was evident from the historic times and how it is evident in the context, in the contemporary situations.

So, I am going to discuss about from the Agricultural Revolution from the early human civilizations and then we take into the context of the contemporary situations in the study of the Himalayan region, where some of our current projects and some of our PhD works are going on.

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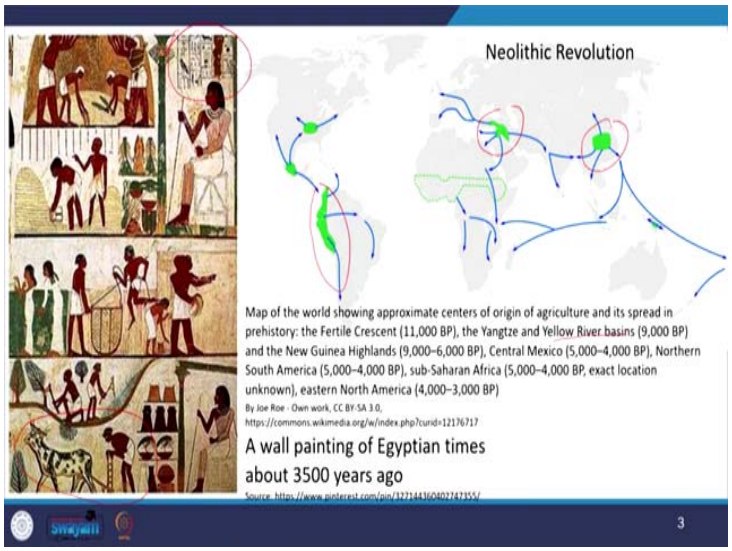

So, what I am going to discuss here is, the very first part it is also coming from an important seminal work from you all know Harari Sapiens and his understanding and his the data, the kind of data which he put through is how the humans have evolved and how their civilizations have transformed and what are the factors associated to it and in that he discussed a very significant aspect how agricultural revolution has become a trap for the civilizations.

So, before that it was all the foragers whether it is Neanderthals or Sapiens they are all the forages lives so people wander around here and there and they hunt animals and that is how they used to live. But then wheat was a very rare grass which was found in Middle East and other places. But then when he started looking at how we can cultivate wheat and how we can store wheat and that is the very beginning stages of agricultural revolution.

Like in a, within a millennium time it has spread across the world of the cultivation of the wheat and people started relying on the processed food, they started relying on as an agriculturalist, they started cultivating the lands, they started clearing the forest to making

their crops and that is where we can see an important evidences because every day this particular map is going, growing upon and then there is a very significant discoveries happening all around the world which dates back to the agriculture revolution.

And for example, you say the degrees where the Fertile Crescent degrees and the Euphrates Delta Region and you have this yellow valley civilizations and this is where and you have these Nile Valley and you have this the Incas and the Andes civilization the South American and you have this Sub-Saharan Africa.

So, in that way there are many archaeological discoveries which actually points out, yes, there was evidences of these agriculture, the history, from the ancient times and even from many of these historic paintings from the Egyptian times about 3500 years ago, one actually can see that the technology how they use the animals in plowing the soil, how used to take the water, how used to sow the seeds, how used to store.

And then again a very important part is the hieroglyphics, all these fonds, where we are talk, cuneiform or a hieroglyphics which comes from the Nile Valley Civilization and the cuneiform from the Mesopotamian civilization, they all are something to do with the accounting process, how much, how we have to store and they have symbolized certain characters so that it can symbolize certain accounting formats.

So, whether it was that day or today we are looking at surviving our next generations, we are thinking about how much we are storing. So, even in today the company is rated in such a way that how much bank balance it has so whether how happy their employees well that is not much important, but how much is their liquid allowances or liquid cash available in their bank balances, so in that way they are safeguarding, if they are not there the other day the company collapses within a day.

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Similarly, it is about even the human civilization thought in the same manner like instead of having 100 why not we have a 1000 DNA copies. Even now we are talking about storing the extinct seeds, the seed bank which we are referring to. So, it is the whole essence of the agricultural revolution, it is the ability to keep more people alive under the worst conditions. So, here this whole process about how our successive generations can lead further.

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Similarly, when we look from the storage point of it, whether it is Mohenjo-daro civilization, Harappan civilization where we find the great granary and then we have even in a Papua New Guinean cultures, you can see these yam houses so these yam houses are nothing but a storage spaces for storing the yam roots of those particular tribes.

So, in fact these are most symbolic in nature, the more storage they have, so they try to decorate these yam houses with the rich ornamentation and as well as they give the finest wood, the finest, they give the finest wood quality and they are built with a fine craftsmanship.

So, in fact the storage becomes an important aspect because we need to retain these food grains or certain aspects of their survival for the future which can actually help the future generations. So, in fact the same way this is where the hunger stones they also created certain warning systems they used to keep these stones and especially when they were found in the river beds, it says these are the hunger stones which says when the level of the water goes down and it is clearly written saying that if you see me weep, so which indicates that yes there is a danger coming soon, so you have to safeguard yourself, so there is a water level coming down, so how it can affect the crops, how it can.

So, in that way there is a whole process of thinking about the future, whether in terms of the storage, whether in terms of warning systems, all these were not today's work but they were all done from the historic times our ancestors have thought in that process. When we talk about the wheat and agricultural revolution, so initially these foragers have turned into farmers so that is an important aspect.

And then gradually when they have storage of food obviously they have also they know that there is going to be enough food for the next generations obviously the reproduction statistics have increased, the capacities have increased, so in order to feed them they need, and they also need more manpower for their agricultural work.

So, in this whole process keep continuing and then obviously it is not a very static phenomenon, it is a very dynamic phenomenon and explain on these populations have increased exponentially and as a result there are some instances where certain unexpected events, unexpected the climate threats which have resulted in certain impacts and this is where they realized that went wrong with them but they never took a step back quitting the agriculture.

It is always they try to find strategies how to accommodate that and how to face that particular situation the threatful situations whether it is a climate threat or any other political threat so that how they can go ahead with it, how can they can adapt to it. And this is where since then they never try to go back but instead they looked at a process of adaptation. So, once upon a time of we call them as luxuries but today they become the necessities.

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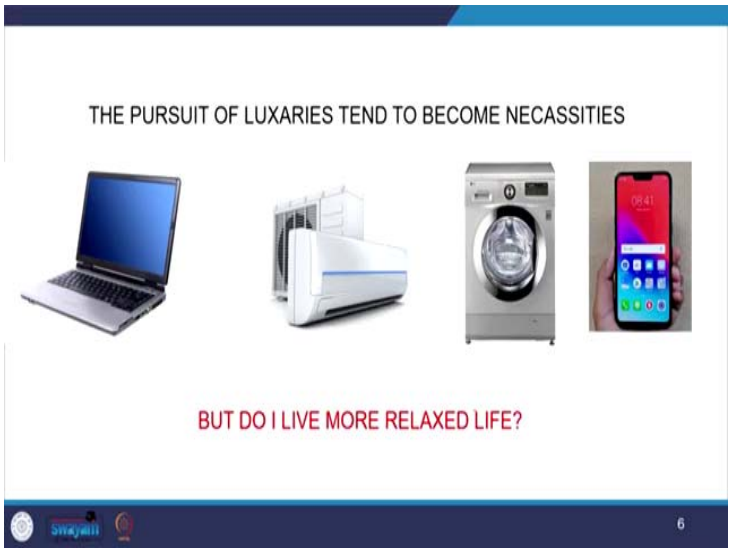

So, in fact when I was a student I have not even seen a laptop, I have not even thought about having a air condition, not even thought about someone, we can talk from our mobile phone or a washing machine but today this has become a necessity. So, once a luxury has now today has become a necessity. So, this is where we need to really think about do we live in a more relaxed life or are we forced to getting into more complicated and dependent life.

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So, this is of one stage, so here I want to inform you one thing on that, the climate change scenario what we are talking about is not the present or the recent scenario, from the human history it has been evident and agricultural revolution itself is becoming evident that is one of

the major factor which played and people there are it has brought many cataclysmic changes as well as the fruitful aspects, which it has brought along to the human civilizations.

So, there are some of the important archaeological evidences which talks about the Gobekli Tepe which is in Turkey, which again dates back to the agricultural revolution about 9500 BC but then here the complexity was, how this evidences talks about, these were built by the nomadic tribes. But how are they able to settle down at one place and build and how did they invested a time and effort to build this particular temple?

So, this is where so many of the questions are nearby about few kilometers away they found some of the evidences on the human settlements. So, now and also, they have found some of the wheat production, the very ancient evidences of the wheat production, so in that way now there is a big question whether the temple have been built first or the village might have grown later, because there is something how many people who can bond them at one place.

One strong reason could be a religious position where it can bond these group of people together to build a temple, maybe when they are started building the temple and they need some food production for it so that is how the nearby villagers they started this wheat production to supply the food resources. So, these are some of the theories which have started about whether the temple have come first or the villagers have come, normally villagers have come first and then the temple have started there, but in this case this in a reverse process.

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So, also the man has domesticated the animals initially what he used to do is he used to get the sheep, the herd of the sheep and then he used to first kill the most arrogant sheeps first

and then that obviously gives a message to the rest of the herd that yes they need to obey the master. So, that is how he started domesticating the animals, he started using them for the agricultural needs.

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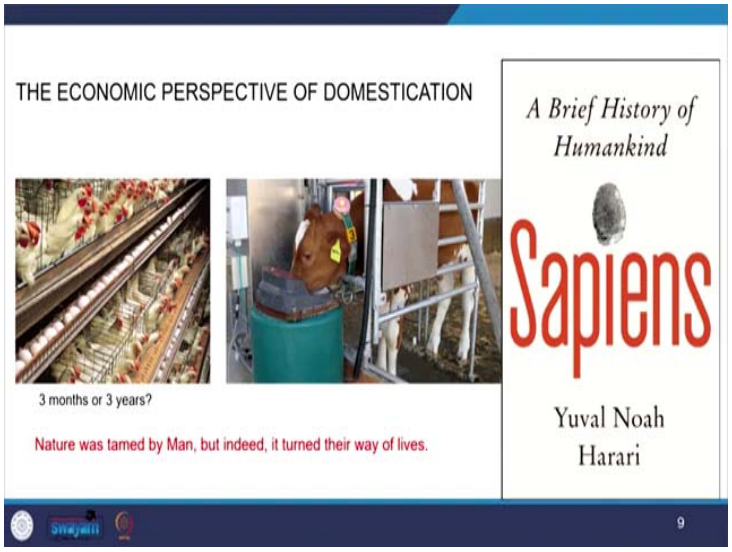

And whether it is the chickens they take normally about three years to grow but by the three months they get the full capacity of their weight. So, why should we wait for three years. So, in that way so man has domesticated these animals. Obviously, it was also need because the chicken's population how exponentially they increase and versus with the our human population there are always the loss of nature which go on.

But look at the other side of it and for example the calves and how the man has restricted their movement, earlier they were all wandering in the forest or in the agricultural fields but now most of them are restricted the whole life in their cage, because, and even either they are mostly used for the reproduction and the moment they are not able to reproduce further than they butcher it up and otherwise they mostly cage them up.

So, in that way the man believed that once the movement is reduced obviously the meat becomes softer, once it is not able to give any further reproduction aspects so obviously they send it to the butchering shops. So, like that so it had, the man has control the way the animals were living and they similarly in turn it has also turned our the ways we are living. So, that is what nature was tamed by the man, but indeed it turned their way of lives.

So, this is where I would like to see the what the seminal work of Yuval Noah Harari have actually talked about this agricultural revolution, how it has brought many positive changes,

but it has brought many cataclysmic changes and which cannot be reversed at any process of time, it is a very complex phenomenon to understand. So, just in my words I would like to read out the understanding of what I understood from this process.

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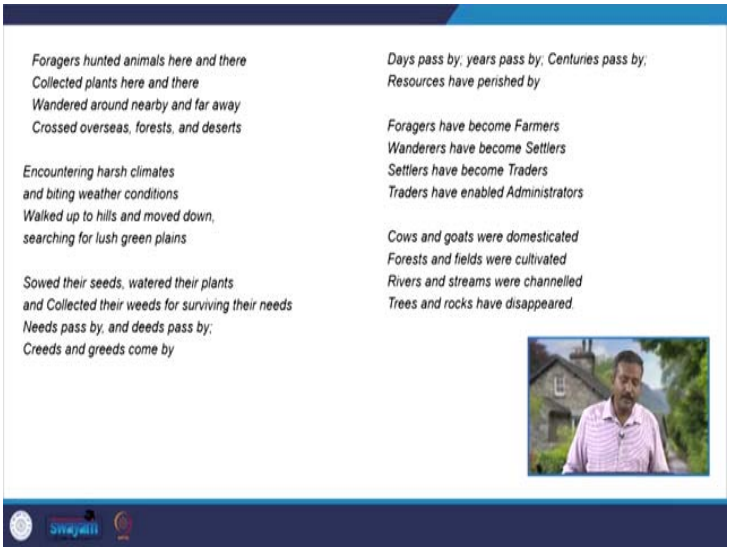

Foragers hunted animals here and there, collected plants here and there, wandered around nearby and far away, crossed overseas, forests and deserts. Encountering harsh climates and biting weather conditions, walk up to hills and move down searching for lush green plains, sowed their seeds, watered their plants and collected their weeds for surviving their needs. Needs pass by and deeds pass by, creeds and greeds come by. Days pass by years pass by, centuries passed by, resources have perished by.

Foragers have become farmers, wanderers have become settlers, settlers have become traders, traders have enabled administrators. Cows and goats were domesticated, forests and fields were cultivated, rivers and streams were channelled, trees and rocks have disappeared. So, this is just a few words in my own understanding, how I could understood the historic aspects of the climate change and how things have changed dramatically.

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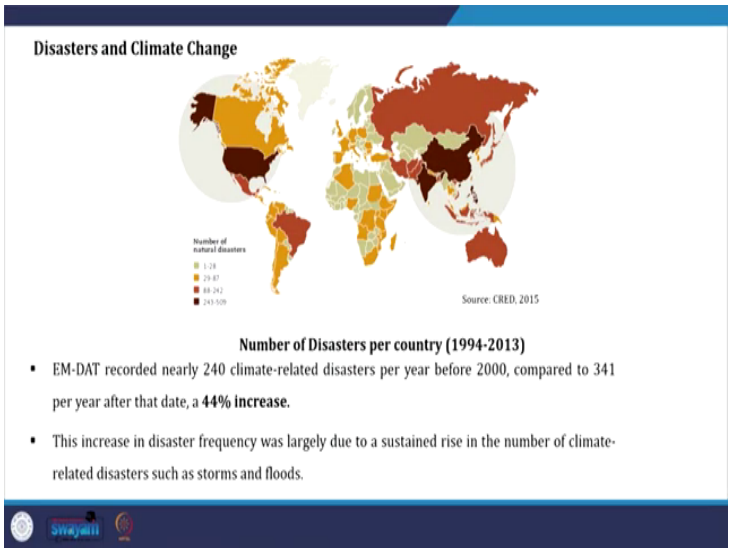

So, the second part of this lecture we are talking about the disasters and the climate change. So, where it is evident and even in our previous lectures we talked about, yes, the disasters are on rise and the EM-DAT information shows that almost 240 climate related disasters per year before 2000 compared to 341 per year after the date, 44 percent of the increase.

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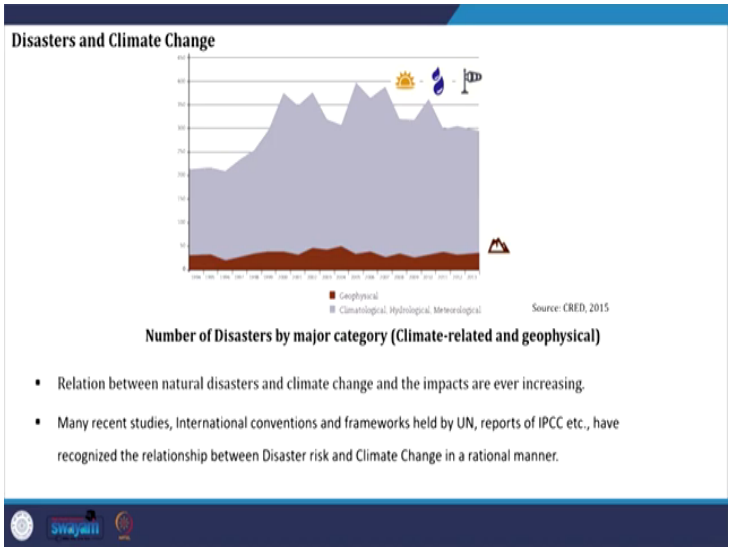

So, if you look at these statistical information many of them are actually the climate induced disasters. Apart from the geophysical or the hydrological or meteorological disasters the climatological and hydrological and meteorological disasters are more prominent.

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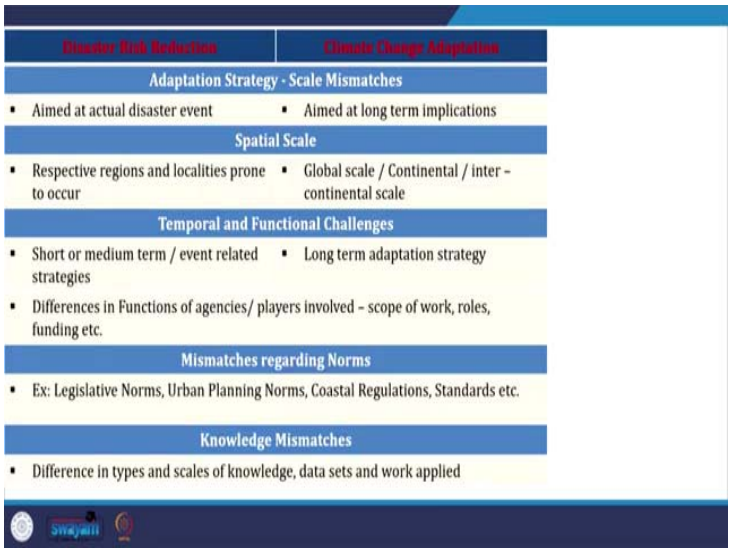

So, now there is different theories we need to integrate the disaster risk on the climate change adaptation. Why are we not able to integrate? Because these are the fundamental reasons. One is, the scale mismatches, because in climate change we talk about a very long term implications, but whereas in disaster we talk more of a disaster event if it happens in Banda Aceh we may talk about the Banda Aceh but here we may talk about the whole Indian Ocean Tsunami or the coral reefs across the world, and much more long-term implications.

Similarly, the spatial scale. In disaster it can talk about a particular scale, it could be a locality but whereas in the climate change it could be global scale, it could be continental, it could be intercontinental scale. Whereas a temporal and functional challenges we have the short- and medium-term related strategies and disaster point and there is a long-term adaptation study like the German climate change adaptation strategy.

And there is also differences in the functions of the agencies the disaster the NGOs which work on these disaster areas, there are short term maybe 2-year, 3 year, they come and do the work of the recovery or reconstruction they move out. But whereas in the climate change it involves the local authorities, the local governments, the national governments to play an important role, it may need certain long-term infrastructure, so the players are very different, the scope of work is very different, their roles and fundings are very different.

So, similarly, we have the mismatches regarding the norms. So, where we talk about there are the legislative norms which at a local level would be might be very different but where we talk about from the national level or maybe it from the global level they are very different.

And similarly the knowledge mismatches. So, we are all positioned ourselves in different domains.

So, for example, earth science people will talk about what is happening in the geomorphological dimension, whereas a environmentalists will talk about on the surface temperatures on the pollutions but whereas the landscape architect will be talking about the flora and fauna of it. So, like that way each of our work contributes to the disaster on the climate change is focused in different scales.

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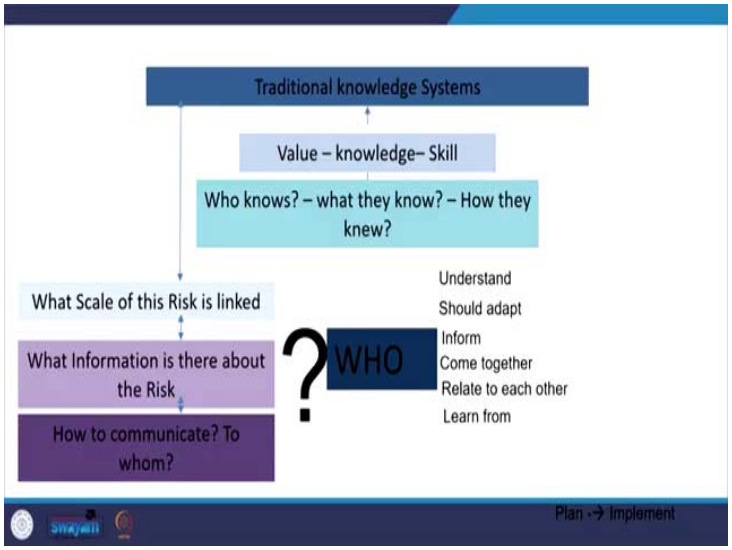

Unfortunately, the problem is how we can integrate these different scales is very important. How are these the traditional knowledge systems, how do, what do communities know, what do they value, what do, what kind of skills they have, who knows, what they know, how they knew, what kind of risk they it is linked with, what is the information is there about the risk, how to communicate and who should understand this, who should adapt, who should inform, who should come together. So, it is all a very fundamental questions when we talk about how we can integrate the traditional knowledge systems in the climate change adaptation.

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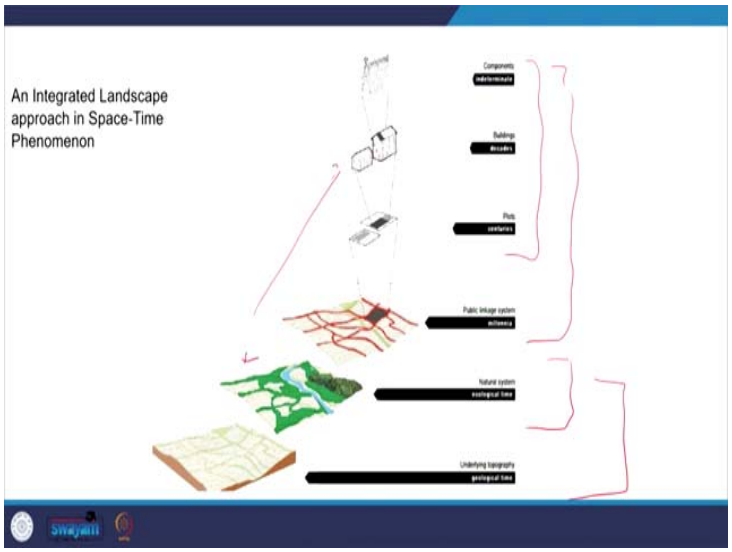

So, this is where I would like to bring Bentley's work on the space-time framework, where he talks about the underlying topography, the natural system, the public linkage system, the plots and the buildings. Many of our architects and planners we work mostly about here, maybe planners may extend a bit of here, but then the landscape architects or maybe the ecologist may work here but the geomorphology they work here. But unfortunately, something happens here will also have an impact on this. If some, so this is something where we need to put different databases together, spatial information on different spatial scales together.

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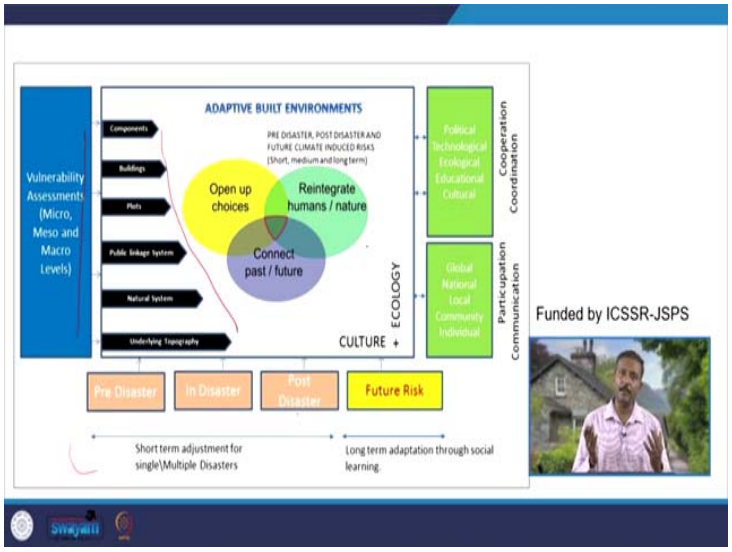

So, this is where in one of our ongoing project of an integrated framework on climate change adaptation and disaster risk reduction and this is a kind of framework where we need to

assess the vulnerability at different macro, meso and micro scales and also how we can relate the information from a smaller spatial scale to a larger spatial scale. And in a disaster what was the situation in a pre-disaster, during disaster, post-disaster and the future risk.

So, this is where the short-term adjustment will talk about and this is where the long-term adaptation how we can develop a social learning process in it and what kind of cooperation between and the coordination between political, technological, ecological and educational cultural institutions.

And similarly, what kind of participation and communication that happens with the global, national, local and community and even at an individual level. So, how we can put these things as a framework because this is all, this actually gives us an understanding of how different data sets could be brought together.

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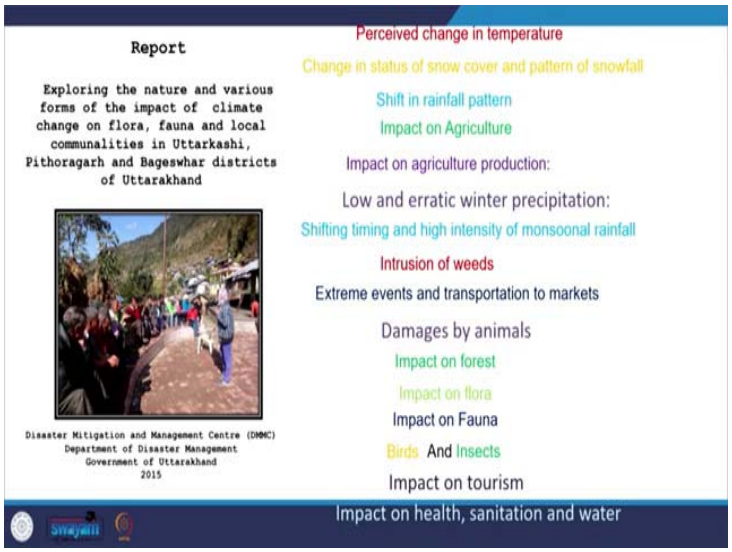

So, I would like to give you certain understandings on how the traditional knowledge systems and how this climate change is affecting these traditional settlements. So, DMMC Uttarakhand have done some studies on how the impact of climate change on the flora, fauna and local communities in the Uttarkashi district and Pitthorgarh and Bageshwar districts.

So, I am just summarizing their findings, one is the perceived change in temperature, yes, many of these local communities in the Himalayan region, they are perceiving certain changes in their temperature, which have affected their snow cover and the pattern of snow covers.

For instance, earlier in some of the villages they were having a huge snowfall maybe for 5 months, say 4 months but today they are hardly saying maybe 2 weeks or 3 weeks. So, it has a different implication when the snow cover is less obviously they can actually yield more crops that is one advantage of it but the other advantage would be because how it reshapes the whole agricultural ecosystem and their living structures.

And it definitely there is a shift in the rainfall patterns you can see the frequent cloud bursts which are happening around and the impact on the agricultural products, impact on the agricultural production. See there are in our own studies in some of these villages which we are studying many of them complain nowadays the langurs or the monkeys they are coming from the nearby forest and they are damaging all the crops.

So, why does all these scenarios which are evident right now because there is on one side there is a deforestation activities happening on because of either highway expansion or some hydropower projects or any other development projects. Obviously, it has an impact on the forest and their ecosystems and their wildlife. So, obviously they tend to come to these human habitat places.

And the shifting the monsoon rainfall, the shifting timing and the high intensity of monsoon rainfall, intrusion of new weeds and there is also how the damages by the animals impact on the forest, the forest fires is one of the evident, impact on the flora and impact on the fauna, birds and insects now they can see even at a 2500 meters high they were able to witness certain cobra which is evident recently. So, this all these changes are happening, rodents are coming up in these higher altitudes, which was not there earlier but now the impact of tourism that is one, and impact of health, sanitation and water, because water is a crucial resource in these mountain regions.

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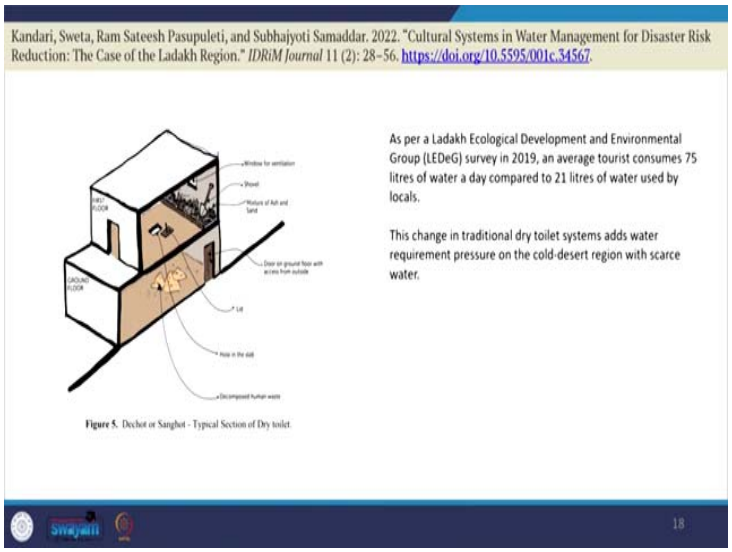

In one of our publication we have given the reference of the publication and from the literature reviews we can see that in the context of Ladakh where a small element of a toilet which was a dry toilet and where they used to shovel the mixture of ash and sand and then it goes back in the ground floor and there is a hole in the slab and it actually gets decomposed human waste, so then it can be used as a manure for their crops.

So, in that way these are the dry systems which they use and they have adopted locally, with the local conditions, local climatic conditions. But now so some of the reports talk about because the tourism has increased exponentially especially in the summer times and the people have started constructing their individual toilets with the flush toilets and that actually have given rise to the average tourist consumed 75 litres of water a day compared to 21 litres of the day used by the locals.

So, now earlier they were all relying on the traditional knowledge systems of the Churs and the Zings systems where they used to collect the water and they use it for the rest of the period. But now the water is directly taken from the river Indus and that is where it definitely the usage of water have increased and the tourists, the tourists who are coming to these places are not aware of these traditional systems in that way to accommodate these tourists definitely it has a direct and impact on these water requirements and it definitely adds certain pressure on the cold desert regions with scales water.

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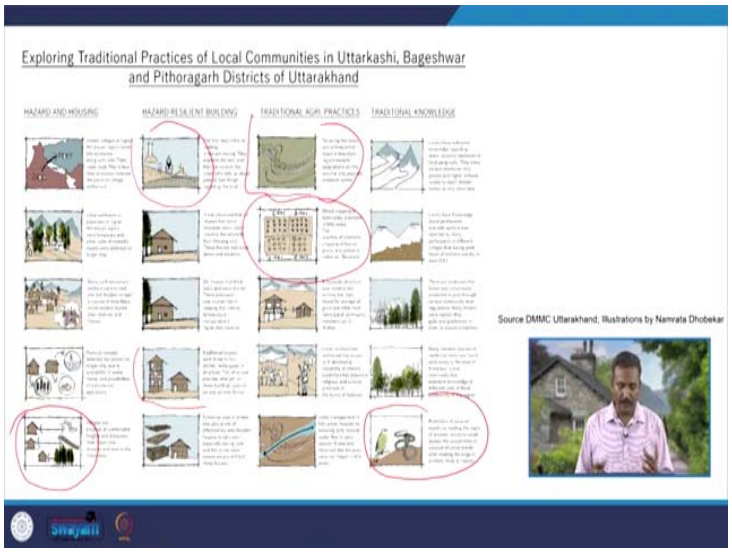

So, there are many reports on these traditional practices of especially in the context of Uttarakhand and the sources are there what we did was so I tried to put that in a one of our student Namrata she developed the illustrations of each of these contexts, like how they developed the mixed cropping method and how they terrace these sloping steps so that they can maintain these agricultural forms.

Similarly, how they use these traditional houses, how they use the wood as a timber material so basically how they distance themselves in how they can identify the better locations for their space, for the dwelling units, instead of having next to a river they try to maintain certain distances and what kind of thumb rules they follow in selecting a site. So, all these are the aspects of the traditional knowledge how the local people can mitigate certain hazards even the sound of birds, sound of reptiles, the evidence of reptiles can also hint something for them. So, this is where how the knowledge systems play an important role.

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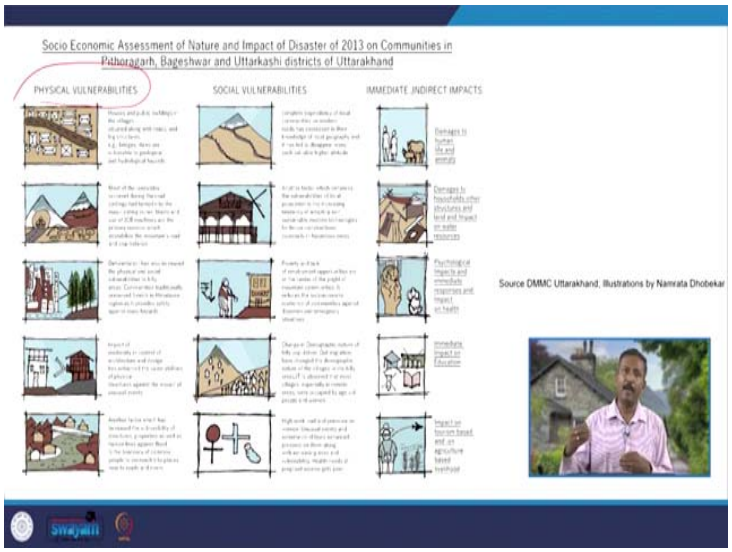

And what kind of damages it causes like for instance you have most of these buildings which were damaged in the past disasters many of them are hotels or the guest houses which were built along the rivers. But actually, the many of the villagers they build slightly on the mid level or in a ridge, so in order to safeguard themselves.

So, in that way they had certain impacts on their physical vulnerabilities on the property damage, on their housing and there are also certain impacts on their livelihood aspects, whenever whether it is a crop production like for instance in our own studies in many of them they said, yes, it has been difficult for them because the animals from the nearby forest it is attacking their crops and most of them are getting damaged.

So, how even then still they are making some more efforts to protect them, at the same time they are also coming because their climatic changing, they are coming up with the mixed crops and so that they are also taking some advantage of that and again how to, how we can channelize these water systems so that so in each of these problematic situations communities are evolving certain indigenous systems or supported by certain development activities.

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So, I am also bringing especially in the mountain areas I am also bringing one of these cultural roots, the many of these people they live in two places, in the summer they go up or up hills and in the most of the winter times they stay in the downhills. So, like that there is also certain trade routes which do exist and in fact they travel across, this is one of the indo-tibetian trade routes from the Pithorgarh district and the paper is published and you can actually go through that.

So, from the Daruchula they go to these high lying places and for them it is not just a target to reach to the higher place but then they go with certain products and then they stay in different villages and go around and because now after the 1961 war and there are certain challenges how to have certain relations with the cross-border relationships especially with Nepal and Tibet. And obviously still people do migrate and they collect something from here, they get when they are coming back, they get something from there.

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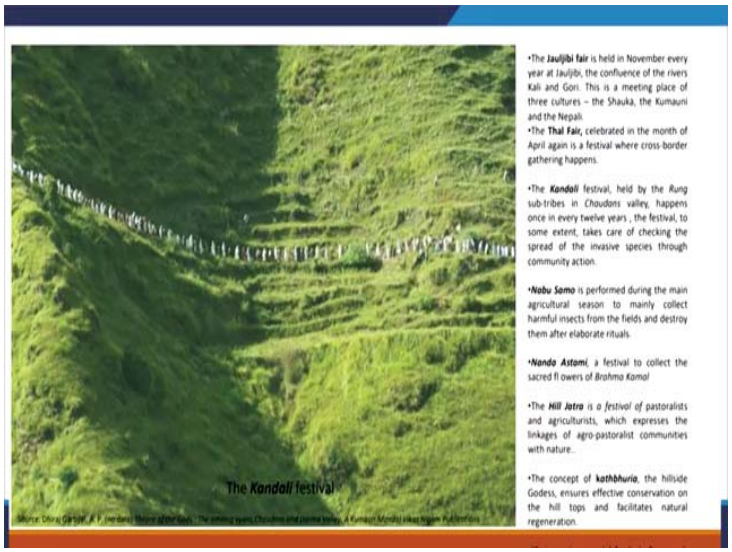

So, in that way they do have certain semiotic understanding of the nature around them and all these communities they follow certain intangible traditions. For example, you have this Kandali festival by the rung communities, rung communities in the Chaudans valley, it happens once in every 12 years and this festival that is actually considered for checking and spread of the invasive species through the community action.

So, in fact all the villagers come together and they take out these weeds and in that way they also maintain their ecosystems not only that they also have certain understandings of the community reserve forest so in fact they really consider that these are the places we should not do anything.

So, in that way they understand why we need to protect these forests, the communities play an important role in understanding these ecosystems and their living with these ecosystems and they are actually responsible whether through they are tangible or intangible traditions they are responsible in safeguarding these ecosystems.

So, unfortunately with various tourism interventions with other development activities which mostly ignore these native the practices. For instance, when we were studying in some of the villages I was looking at documenting each and every house and we were going to every house and many a times these communities they offer you a tea. So, every house they were offering a black tea and I was little surprised why everyone is offering a black tea.

And I asked them what was the reason is it a really a traditional practice of having a black tea or not? Then many of them they come up with some different stories, earlier they were

having a milk tea but then because earlier the animal husbandry is proportional to the population they had, but today their population have increased and the animal population gradually has not sufficient or decreased in some cases.

But many of them shifted their jobs so in that way whatever the milk production which is happening within the village is not suitable for their daily needs or the communal needs. Similarly, now the milk is coming from the plains to the hills, and similarly the solid waste management, earlier they used to have these indigenous festivals like Pahadi Diwali, so where they had certain myths associated to it, there was a kind of a wrestler who went to China and he was released on that day and then that is how they celebrated.

And the way they celebrate is they bring all the solid wastes from each dwelling and they burn it on that day. So, in that way it is a self-processed structure where they manage the solid waste management. But today not even many of them does not know what that means and also the water harvesting systems like the Gratte Water Mills. So, now many of the youngsters not even know where these Grattes in their own village, because they are not used for some years now.

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And how do one can investigate these indigenous systems like the buildings how they use the timber and the stone the Kath Khuni Styles and they have the timber buildings including the religious buildings.

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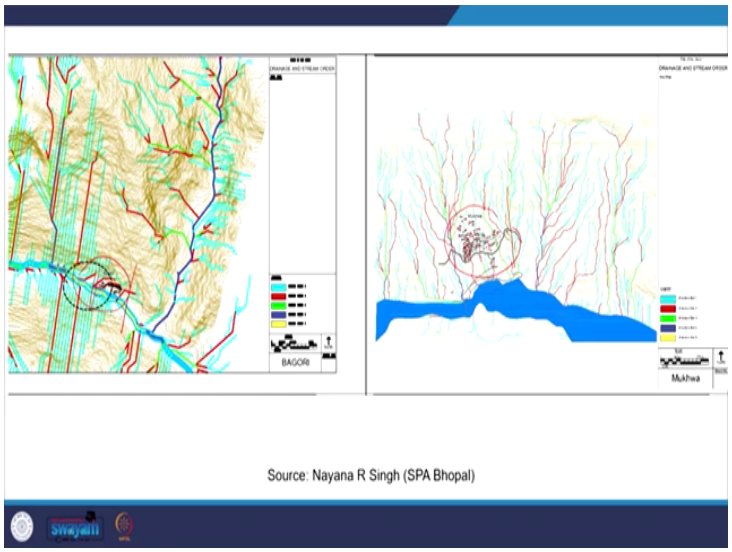

And why do they really located these places, how do they identified these places as a dwelling? Like one can really see like one of our student Naina, she actually used the GIS techniques and come up with the drain patterns and within these drain patterns you can actually see that this is Mukwa Village and none of these patterns are actually not passing through the village, most of it is passing on the either side of the village. In that way with their indigenous techniques they were able to identify the location of these settlements, and they also were able to define the limits of these settlements.

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So, like that and the typology of houses, how and today many of the needs have changed, the people who were living here many of them have gone to the plains and they have got a

different employment and most of the villagers you can see many of the elders are still living and in some of these houses you can find that some of them are abandoned also. So, these are some of the issues one has to really look at it from the development part of it.

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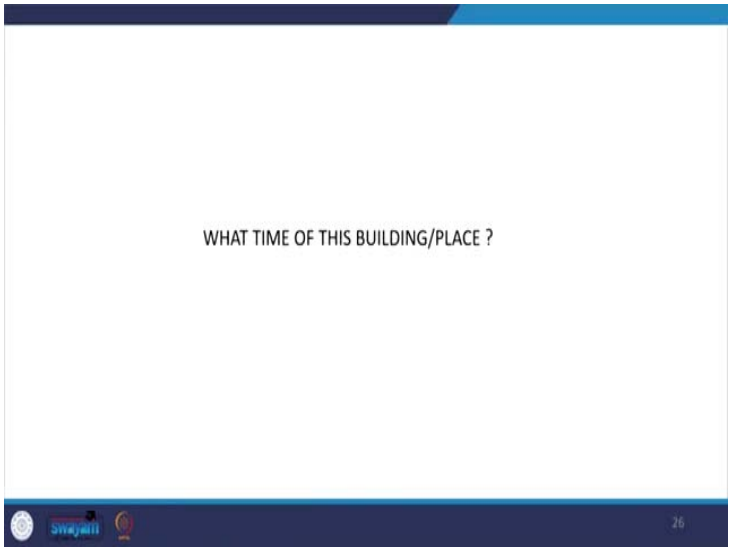

So, this is a kind of background of the climate change and the traditional knowledge systems and how people rely on that both the tangible and the intangible traditions.

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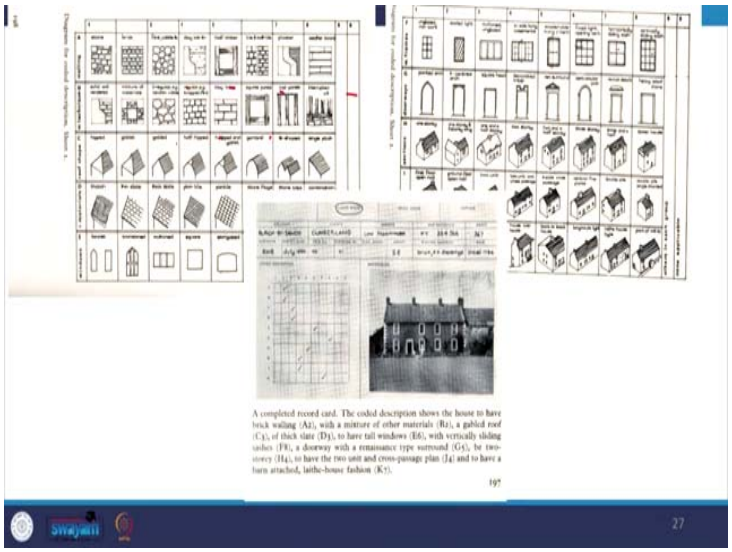

So, let me show you one of the example of the kind of technique what we looked at how communities perceive with the changes and what the reality is about. So, how we can contrast with both, how we can compare and contrast their understandings?

So, here we actually adopted the Brunskills method on how to document these traditional buildings. Because when you are documenting many buildings and we are going to have this kind of templates pre-prepared and then this becomes a kind of coded sheet which place, which address and just becomes this is a complete, this is a coded description shows the house to have a brick walling and which is an A2 and with a mixture of other materials which is again a B2, cable roof and with thick slits like that it gives a nice description of each of the house.

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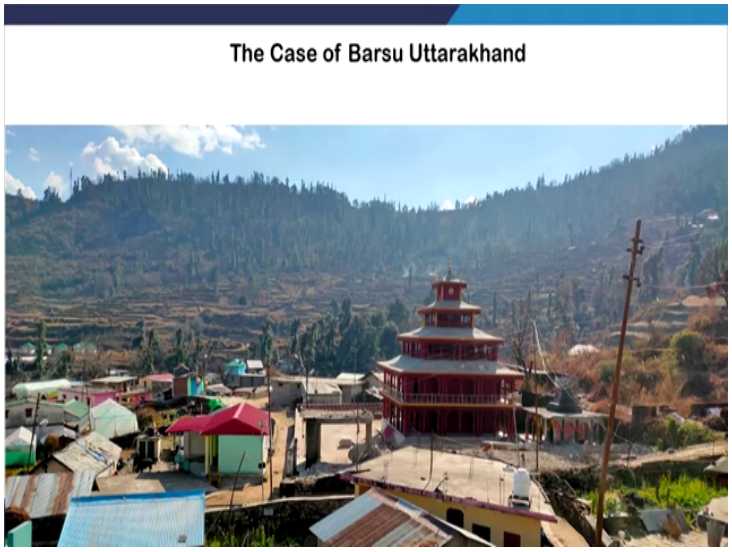

Similar thing what we followed in this particular study, a small village, so as I said what happens at a micro level and what happens at a meso level, these are the things we are trying to bring up together. So, now as a, for this lecture purpose I am going to show you at what happens at a micro level like this is a case of the Barsu which has been affected by the 2012 floods and even till today since 8 years, 9 years many of the houses started gradually they were sliding down and many of them, they were able to, they were able to see lot of cracks in their houses, some of them totally damaged and every new visit I go I see one of the two, one or two houses missing from the service.

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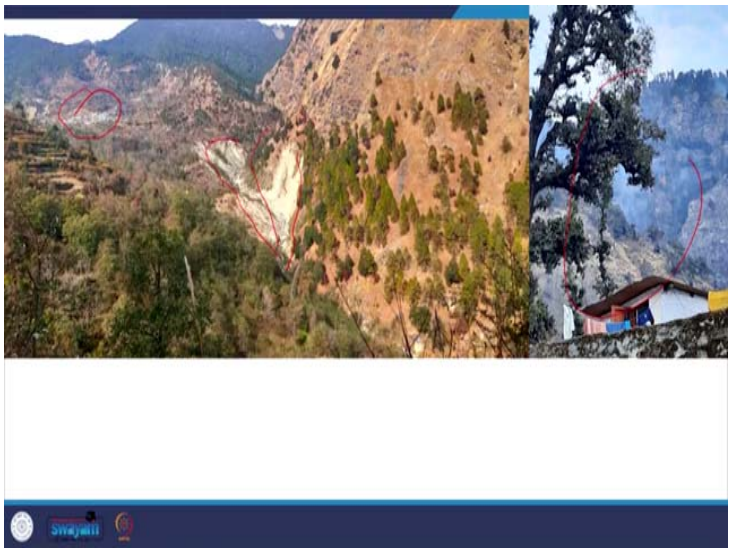

And this was the reason why, this was the swarigad which has fallen down in 2012 floods and this was the Barsu village. So, though the impact is seen from here but you see the glacier lake outburst which actually impacts somewhere down the line here and then and that actually impacts some small settlement there and a group of settlements nearby. And again, the forest fires from the neighborhood villages that is where many of the monkeys or the langurs they are coming and destroying their crops.

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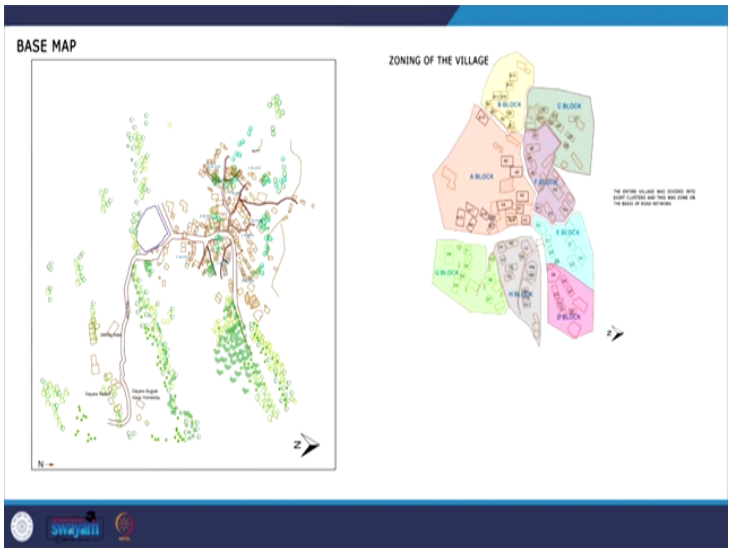

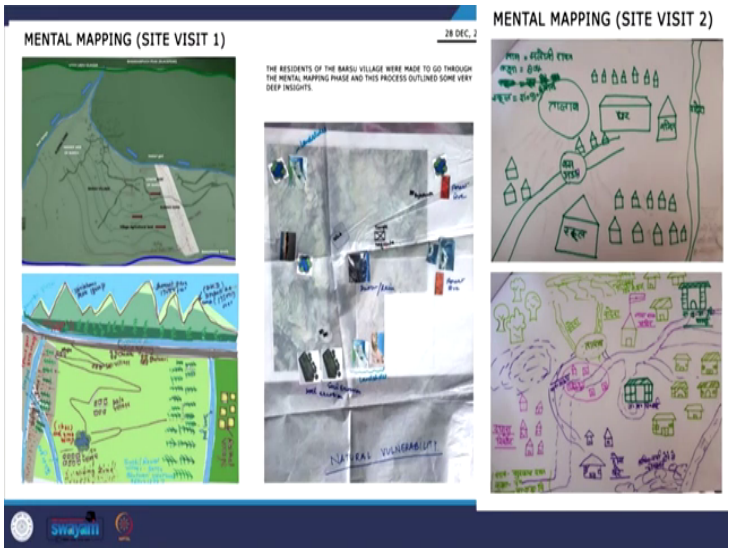

So, what we did was first of all we did some interviews with them, we did some mental maps. And so in the first stage of work we actually interacted with the communities that saying that what is the how do you really understand this place where are the threats coming from, that is where you see people have really pointed out, yes, this is called sliding zone and they also talk about how their mountain peaks that the Srikanta and there is they know what is the height of the mountain, they know what is the height of these mountain peaks, this is Draupadi Ka peak and how it is melting down and how it is affecting our village.

So, they are having an understand the community knowledge is very important and how they have an understanding overall understanding of their setting also it is not about just only about a village but about the settings, what mountain peaks around, how they have been changed for the past 30, 40 years of their life.

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And now you see this is a fish pond they have recently made and then you can see many of them there is an inlet is there but the outlet is not there and this is the whole village and now there are some practices which they have developed to protect their agricultural crops, they are making a small-crops in that.

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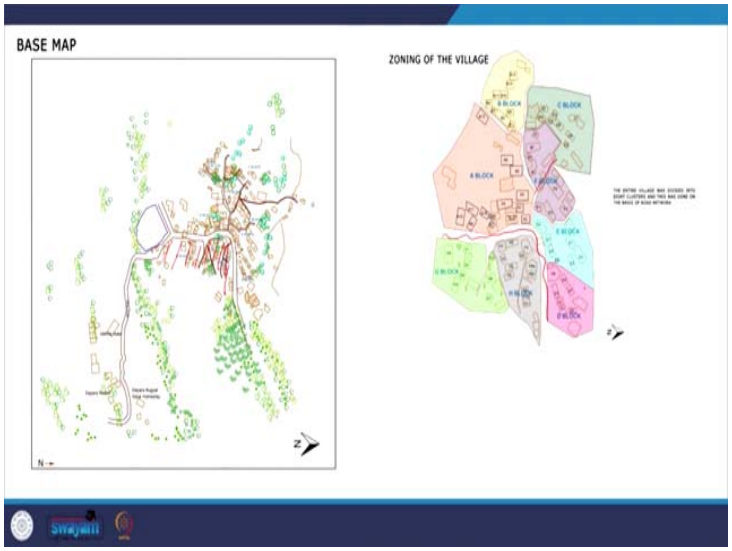

So, when we in the first stage of our interaction we really started interacting about really what do communities understand about this climate change and then what do they understand about the disaster impacts. And they started telling about various oral histories, narratives and we try to put them in different textual formats, all the videos were recorded we put them into textual formats.

And then many of them said yes there is most of this region is affected the others is fine but then we want to really verify whether how the perceptions are changed, then what we did was, we did a household survey almost being a small village we took the whole streets as the dividing component and then we divided into a, b, c, d, e, f, like that.

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And then we developed interaction with each and every household, a group of students we work together and then we documented and we have taken the mental maps from many of these households.

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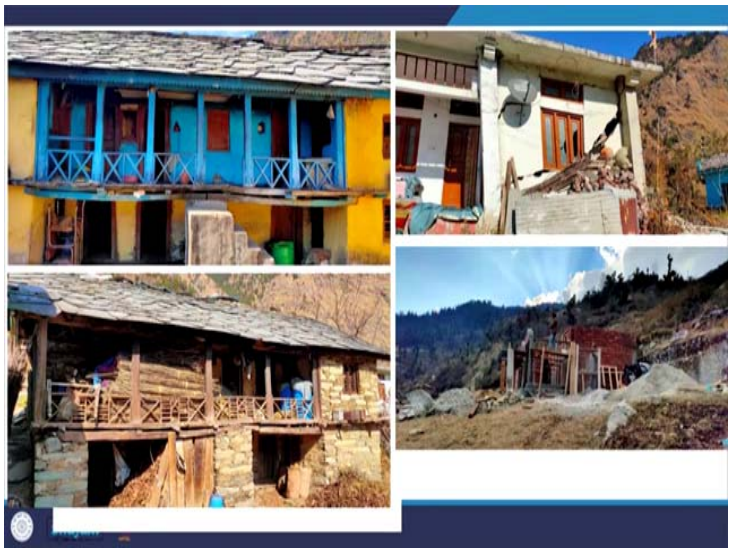

And we can see many of the traditional dwellings today they are not occupied because of many of them were damaged internally. Even the newer buildings have damaged within just

2 year old building got damaged. And now the newer building can you see there is no sill band, there is no lintel band and so now this is giving me a different thing because even the technical guidelines are not followed in the present constructions, this is also evident in that. So, it is not just only what community perceive was the reasons but there are also some technical issues in that.

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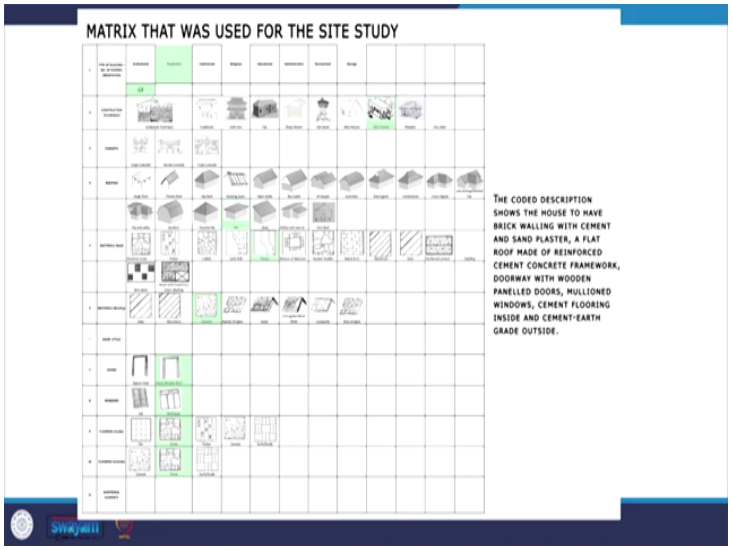

So, we developed this matrix and after doing some reiki studies we developed this matrix so that we were able to tick down so that we take multiple copies of that.

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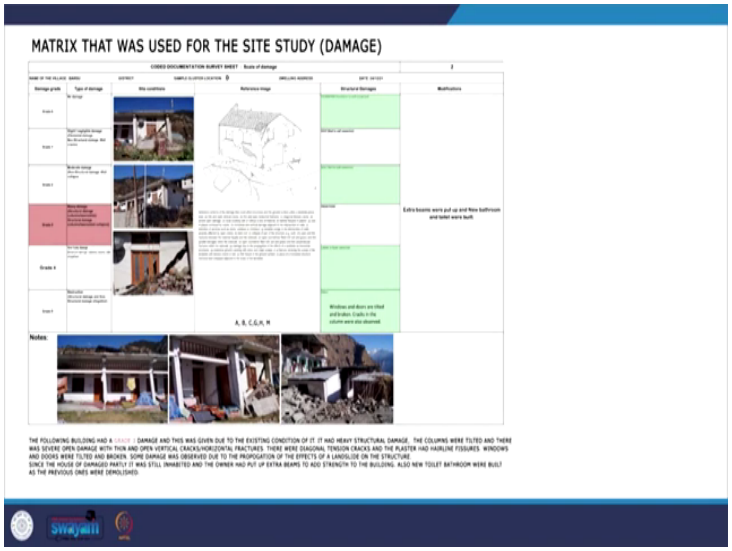

And then we also using the sum of the Japanese framework of how to assess the building damage so in that way we started each of this building we damaged with the photographic

evidence and then with the grade 1, grade 2, grade 3, grade 5, with the kind of damages which we observed in the non-destructive formats, so in that way we graded all these dwellings.

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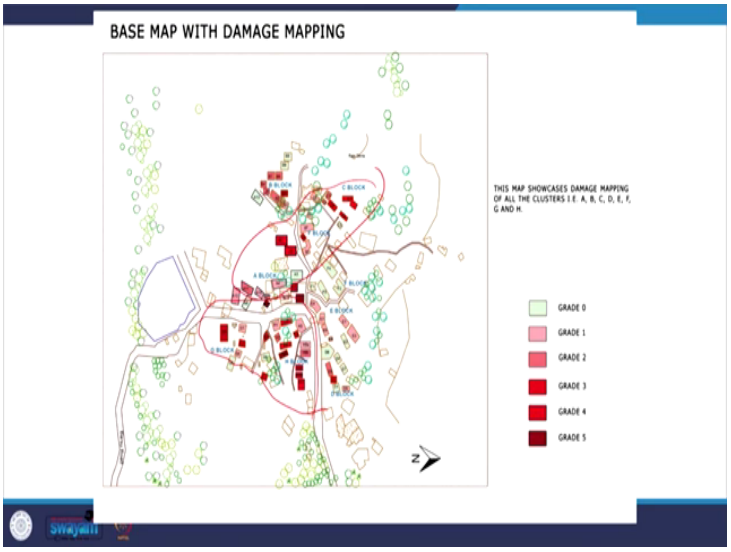

And then we mapped into the overall spatial layer and now we can see what the communities have thought was more, most of the maps are talking about here that what you can actually see is something beyond it, the main grade for grade 4 or grade 5 buildings do exist even above. So, in that way there are certain perceptions which one can see as a community but there are also something as a, these are the facts which we could see as an outsiders.

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And have said the climate has been changing quite a bit and all our life snow was for 2 months, 3 months, now it is only for 14 days or 15 days, so like that then why not we get the real time data so that is where from the NASA we could able to procure 40 years of the data the maximum temperature and the minimum temperature. I am showing you a sample of it and then we could see surprisingly the summers and winters they were almost constant.

But what is really changing was the transition months, the transition months that is where you can see the April the transition months either it is going up or down, either it is becoming very high in the transition months. I think these transition months are very important for especially for these agricultural productions.

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So, like that we in the next phase of our work we will be going to the villages and actually showing them what we did objectively what we did study about their buildings and their settlements and their settings and what they thought and then what were the real problems, is it the problem only because of the land sliding which is happening for the past 8 years, is it the same reasons? And we are going to take some of these technical expertise also to really assess these situations along with the community. And this is how we need to bring the communities and the scientific community together to discuss how we can take it further.

So, with this I would like to summarize this understanding of my experience in working with these Himalayan communities with those small few lines I played in Golden Sun shivering in frozen snow, seeing peaks and melting glaciers around me, playing with flowing noisy streams around my village, sleeping with glittering skies looking at me.

Our village has one chakki mill, chakki is a flour mill, that ran on water streams, chakki mills on hills is a local till, that tills until the water is still. One dark night, a thirsty cloud burst cursing all of us, our fields and our homes, left nothing more, pouring more and more, nothing more, nothing more. A politician came and said let us move from here, an engineer came with a tie and said let us take this stream there. Another colored tie came and said let us expand the highway. Tie and ties came together but never tied together for promoting better and safe environments.

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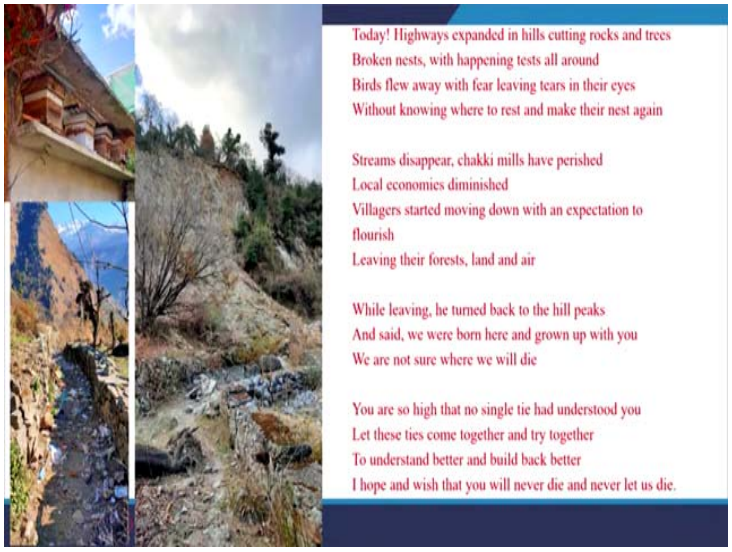

Today, highways expanded in hills cutting rocks and trees, broken nest with happening tests all around, birds flew away with fearing, fear leaving tears in their eyes without knowing where to rest and make their nest again. Streams disappear, chakki mills have perished, local economies diminished, villagers started moving down with an expectation to flourish, leaving their forest, land and air.

While leaving he turned back to the hill peaks and said we were born here and grown up with you, we are not sure where we will die, you are so high that no single tie had understood you, let these ties come together and try together, to understand better and build back better. I hope and wish that you will never die and never let us die. So, this is how I would like to summarize the whole narratives of people's experiences there about what is happening with them around there with their environments. Thank you very much.