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Lecture - 11 The Built Environment Professions in Disaster Risk Reduction and Response

Welcome to the course disaster recovery and build back better.

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Today, we are going to talk about the built environment professions and disaster risk reduction and response. Until the Tsunami recovery, there has been a lot of professionals get involved either in the terms of voluntary organizations or through any development agencies or any local NGOs. So, many of the professional youngsters and even individuals or even groups they try to get involved under the immediate impact of a disaster.

They try to get involved and try to contribute to some sort of assistance but then especially from the built environment because we are trying to talk from the built environment perspective, there are various disciplines comes within that bigger umbrella. My own experience when I was in Devanampattinam village, and I was documenting a few fisherman villages, I have come across even many dentists is involved in the reconstruction part of it in the smaller fisherman Hamlets.

So, they were coordinating with some NGOs, so which means even a medical body apart from his medical profession how he is engaged in a different manner has actually you know and one side it is exciting to see how a different profession is contributing to the shelter process. On another side, I also have to see how the relevant processes are not on the table you know relevant professions are not in the discussions. So, in that way, we can see a good overlap of various professions like what is the role of an engineer, what is the role of an architect, what is the role of a valuer you know.

So, all these come, professional individuals come together to contribute for building back better. So, this is where to understand this jargon and to classify various categories and roles and responsibilities of each profession and how they can contribute to the disaster risk reduction and more focused into the built environment practice. There is a guide to the corporates, all the NGOs who are working in the humanitarian sector.

It was developed by the Max Lock Center in University of Westminster, London where I was doing my doctoral research at that time and my supervisor Tony Lloyd-Jones and his team they have contributed a guidebook for the humanitarian agencies.

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What is the role for whom and when? So, this is the report which you are looking at it, the built environment professions in disaster risk reduction and response. And this guide have noted a number of challenges. For instance, it presents the variety of different built environment professions and the complexity this presents; because you can see an architect, a planner. A planner's pre-qualification as an architect who have turned into a planner and an engineer can turn into a planner. So that is where a very complex situation of understanding

the professionals contribution and its scale on the spatial scale, a lack of precise understanding of what each profession does and how they relate to one another.

In our built environment education, especially in the architects training, we do have training on the surveying and leveling. But then to what extent it is useful in your daily practice and especially in the disaster recovery programs to how you can actually take away the knowledge from the surveying and how you can implement in the architectural practice. What is the limitation and what actually the surveyor who have done his qualification and what is his role and a person who has a smallest contribution what is his role, you know this matters a lot, this was a complexity.

There is always overlap because everything is interdisciplinary. The architecture has a part of planning, an urban design and on one side you are talking about the structural engineering, one side you are talking about the surveying. So, this interdependency of expertise and the need to bring together teams of practitioners from different disciplines. There was a great need that we have to work with different teams of experts.

Also, a lack of information and how to employ built environment practitioners on individual or teamwork basis, whether a particular individual is likely to have the relevant expertise and experience?. In fact, one has to look at what kind of information do you have. Especially, when you have to hire some agency or form a team of architects or planners to document something or to do a habitat mapping exercise.

What kind of relevant expertise one has to look at it, what kind of relevant experience one has to look at it. If we ever look at any recruitment website of United Nations, UNDP or Aga Khan Foundation or any other agencies who are working on the humanitarian shelter programs, they often describe that if you have an experience working in the humanitarian sector, how many years?

We have the project management on this, irrespective of whether you are an architect, whether you are a doctorate candidate or if you are whatever the rich qualification you have, but they look for whether you have worked in this context or not, whether you have some apprenticeship where you have so which means that forms a basis of an understanding of the professional to get an understanding of the reality of the disaster context.

Uncertainty as to how long they may need to be engaged and for the associated cost. If you have to engage an architect or an engineer, how long one can engage? Is it throughout the reconstruction process? Is it from the relief stage to the post-disaster recovery or the whole reconstruction stage? To what stage one has to be engaged? Which profession has to be engaged in what point? Where are the pickup and drop points of that particular profession?

Where are the travel together partnership positions? The fact that these different professions can vary considerably from place to place both in name and the specific areas of expertise that they offer and also there are many misunderstandings arising through professional jargon.

Here, this particular guide brings the Hyogo Framework for Action and built environment practice. It talks about the guiding principles, what have been listed under the Hyogo Framework for Action and how it is relevant to the built environment practice and what kind of activities one has to look at it.

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The first point talks about ensure that disaster risk reduction is a national and the local priority with a strong institutional basis for implementation. I would like to share my own experience. When I was doing my architectural thesis on disaster recovery in Gujarat, many of my friends advised why are you taking that project, do you really have a future in that profession?

And because unless you may have to wait for a disaster because there is not much of awareness during my time whether this field has such a large gateways and different disciplines to work together. And later on after the Tsunami, the many of the state governments and the national governments and the international sectors, they have emphasized that it has to be a national priority also with the local priority.

And there should be a strong institutional network, and that is where the National Institute of Disaster Management has been formulated and then you can see the State Disaster Management Authority, you have the District Disaster Management. So, there is from nation level to the state level, and you have the local level that whole hierarchy has been established.

When all these has to work in an instrumental level and also the institutional level, which can formulate land-use planning, the building codes, the control mechanisms which can reduce the disaster risk from hazard. Also, ensuring that appropriate zoning and building regulations are in place and being properly implemented. In India, until the Tsunami, no one have realized the importance of coastal regulation zone which was earlier formulated in 1991.

And it has been revised 19 times still there, and even then there is not much serious implication that people started building near the sea-shore, and that is where many of the houses have been damaged in the low-lying areas. So, one has to understand that importance of this policy level decision-making process and how it can be taken to the local level implementation strategies.

That is where we talk about the building safety and the protection of critical facilities such as hospitals and power stations and draws directly from the expertise of the practitioners. So, under the any immediate impact of a disaster one has to look at how you can safeguard the people, what are the facilities the basic like hospitals, schools or where you can put them, how the sanitation facilities? The immediate response could be facilitated, so all this has to be taught.

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Identify, assess, and monitor disaster risks and enhance early warning. So, one has to look at the risk assessment process I think in the whole course we are talking about many of our lectures are focusing on the risk assessment process which rely on systematic hazard mapping and risk information collections, how the historical layers of the risk also talks about yes this is a prone area and inundation maps.

And in Turkey, surveyors catalogue and make available detailed information on building construction throughout the country. So, they make a catalogue that which part of the region and which is affected by the earthquakes because a fault line goes in that region and such kind of catalogues will help, and it can actually give a meaningful solutions for any local authority to work on a disaster preparedness plans or which could also talk about targeting schools and homes and workplaces.

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The third principle is use knowledge, innovation, and education to build a culture of safety and resilience at all levels. So, we also need to talk about the sectoral understanding, the sectoral training of engineers, architects, and surveyors also the masons you know how to train them. That is where in Hunnarshala you can see that the NGO's have been incorporating the skill development programs.

How they train the rural communities so that they can also secure skill as well as the employment and they can enhance their livelihoods. So, it has to become an essential part of culture of safety and resilience in the construction industry, especially in the hazard-prone areas.

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Reduce the underlying risk factors; and it is not just a story of a building which is prone to the hazard, it also we have to talk about the environmental management, how a larger sector can reduce the risks related to natural disaster because it is all a chicken-and-egg story you know something happens here, something happens big, something happens big it happens it affects the small thing.

We talk about the climate change, is there a relationship between climate change adaptation and the disaster risk reduction.

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So, the fifth principle, strengthen disaster preparedness for effective response at all levels. So, practitioners have a key role in disaster preparedness and response, and it also has to outlay the human and financial cost of any catastrophe and what kind of repair and the reconstruction is going to cost and how to procure the local skills, how to procure the resources, so all these things fall within there.

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When we talk about the built environment, the guide describes the built environment which refers in general terms to human settlements, building and infrastructure, transport, energy water, and waste and related services and it also includes the commercial property and construction industries and the built environment and the related professions.

So, when we talk about the professional, who is a professional, the term built environment professional includes those we refer to as practitioners primarily concerned with providing technical support services, consultation and briefing, design, planning, project management, and implementation. Also, someone who can investigate the technical failures including monitoring and evaluation studies.

They may be employed directly by a client or indirectly through a contractor. So, apart from this monitoring and assessments, they also are very much concerned with the designing and implementing the policies, standards, codes and the regulatory frameworks which have a crucial influence on reducing the risks from the hazards and apart from the dissemination part how this built environment practitioners, how they disseminate the knowledge with the training and the professional education and the research.

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So, we have a set of expertise, the surveyors, the engineers, the architects, of course in the architectural profession, we have another one the builder and the client, but in a disaster context it varies with the context in the context. So, the main question is what expertise to use and when. This is a very fundamental question which this whole guide talks about. So, for this, the team has understood that how one can look at the process of understanding the disaster management.

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They have identified the 7 phases; one is the risk and vulnerability assessment, risk reduction and mitigation, disaster preparedness and pre-disaster planning, emergency relief, early recovery and transition, reconstruction, post-reconstruction development, review and ongoing reduction. So, we are talking from that is where we draw a line, so this is more of pre and then during and then a long-term. So, this is how they looked at the process of before disaster, during disaster and the postdisaster. So, in that process they have classified.



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So, a framework have been understood a conceptual understanding how a disaster risk management and response spiral from the impact, you have the relief which happens only for a few days like providing you know securing them, clearing the debris and water, food you know for the immediate, as immediate response and then gradually how they secure the livelihoods or how they get on to their works or how they can provide some temporary early recovery in transition.

And one can look at the reconstruction phase, and that is where when we talk about, when we are talking about this, we have to understand that you know how we can integrate the sustainable development and that is where one has to look at the disaster prevention and the sustainable development. So, there is you have to create that because this might repeat again because the same incident might occur again and again at the same place.

So, how one can understand this and how can plan for it so that you can reduce these risks later. So, that is where one will try to you know improve the resilience of vulnerable communities and inform the disaster management process to reduce the further risks. So, here the cycle actually shows the unfolding over time and offer the opportunity of achieving sustainable development in the disaster management process.

So, it talks about if you want to achieve the sustainable development, you need to understand that pre-disaster conditions which can reduce the risk and vulnerability and increase the capacity, the resilience of local communities to a goal of disaster prevention. So, that is where your training, all the capacity building will focus so that it can actually help the communities further.

	Activities	Architecto	Roles of pro	plessionals	Engineers	
T	Pick and vulnerability accessment	Architects	Surveyors	Flanners	Engineers	
	Disaster risk reduction and mitigation					
	Disaster preparedness and pre-disaster planning					
6	Emergency relief					
٤	Early recovery/transition					
(-)	Reconstruction					
T	Post reconstruction development and review					

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So, this is how all these 7 phases have been listed out by time and then 4 different professionals, architects, surveyors, planners, engineers. This is a kind of framework which they try to describe the whole guide. Now, let us say a few activities.

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What are the activities that include in the risk and vulnerability assessment? It can talk about the nature and magnitude of current and future risks. Are we predicting any earthquakes, are we predicting a Tsunami, are we predicting a landslide in this process, which are the areas which are landslide prone and in that process, where you can procure you know where we can actually facilitate them like hospitals, schools.

And how different techniques could be used in using computer modelling, satellite image GIS techniques, and it could be also the participatory the communities knowledge and how their knowledge on the vulnerability and the ability to cope. So, all these things will come under within the risk and vulnerability assessment.





If you look at the social causation of the disasters, God has given as a natural environment and then if you look at how this environment has been distributed, it is distributed, it is spatially varied; it is unequal distribution of opportunities and hazards. In South America, they have rich gold mines, but they have again some disaster affected areas. Similarly, in some other part of the country, they do not have anything, but they have very less resources.

So, there are obviously talks about their good opportunities and the hazards, and then this social process determines unequal access like for example even the gender and Tsunami recovery time you have noticed that many of the women have died because they are unable to swim. It may be a different case if it has affected in a different part of the Western continent because the women they know how to swim; they are taught in the school.

If you do the same thing in Saudi because there is a huge in the Middle East, so they have the skill difference is so huge because women have certain restrictions. So, in that way, it

obviously talks about different opportunities, different access to certain resources, different class, different gender and the disability. What about the disabled people? The refugee, immigration status and what kind of facilities we provide and not.

The social systems and the power relationships and the political and economic systems at the national and international scale. So, this whole chart talks about how different dimensions contribute to the risks. If you are talking about the statistical aspect, if you look at this particular table from the CRED Center for research in Epidemiology Disasters, you will see that the famines, these are the slow onset and the rapid onset.

The famine which is a drought is 86.9% deaths whereas what you see the rapid onset disaster is very negligible. Similarly, you can see the deaths of the political violence is 270 millions and 62.4% which talks, this is what the data talks about.



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And now there has been advancement in the tools, how a surveyor can naturally do and the geomatics people can develop the hazard mapping, the landside prone area, this is a map developed from my Ph.D student, assistance from the Geometrics Department.

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And risk reduction and mitigation: Here, we talk about what kind of strategies or the policy orientation, how we can frame to reduce the vulnerability to already known risks, and we have to talk about how to strengthen vulnerable structures, prevent building activity in high risk, so how we can prevent those activities and managing and maintaining assets, continuity, also community-based disaster preparedness. So, these are all comes under risk reduction and mitigation.

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Like when we talk about the building regulations, if you are to prevent something and in fact, Cassidy Johnson was talking about the building course, the need for the building course especially in the low and middle-income group countries. So, there is global assessment report on disaster risk reduction talks about creating an enabling environment for disaster risk and this especially focus on the regulatory frameworks for land use planning and building. And if you look at it, it talks about the informal settlements which are often tend to be affected. It talks about the building and construction level; this is more of a planning and land management. So, these are two different scales should try to cover that.

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And the disaster preparedness and the pre-disaster planning, so we talked about you know what kind of skills we have to impart and how we have to prepare for it and later on after the disaster, we have to talk about emergency water supply and sanitation. I do not know if any of you remember after the Hudhud cyclone, the roads have been cut off and being a coastal area, many victims have not even got drinking water.

They were unable to serve some basic needs because of the connectivity issues. Similarly, in Kashmir floods where after one week or two weeks then it has resulted a different set of disaster, the epidemic and endemic diseases because the water have went down and different mosquitos have breed, and it has resulted different set of impacts.

In the emergency relief, one has to look at the logistic planning, how you can procure these materials, the temporary tents, the food, the shelter and how we can transport them, how we can make sure that the livestock is protected you know, so all these aspects, relief shelters and sheltering materials. So, if something happens, how to safeguard them and what kind of temporary structures we have erect and what time it takes, this is all preparation.

The project planning and management: So, this is where a strategic action plan and how this immediate relief conditions has to be operated because the different actors come into the place.



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Like a good example of how the surveyors can prepare using the GIS based database, how they prepare for the future risk events. In the early recovery and transition, which moves on from the relief stage that is where we talk about how one can do a survey of the physical conditions of the audits, the audit process.

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How to facilitate whom, how many houses for this village and which village we have to give priority. So, all this part has to be given and this is where we talk about compensation packages, rapid mapping exercises with community resource mapping, housing needs, land survey and acquisition because the main important part is here that if we want to provide any temporary shelter, where do you provide, where is the space, which is a safe place and how to negotiate it. So, all this comes in the land survey and acquisition.

Housing needs, how many people or given for the whole village or only a set of people who got damaged, partially damaged, or fully damaged. So, this whole audit process goes on, and that is where one has to look at. For example, on the right-hand side, you see for the same kind of activities, architects will advise on the selection of building materials and technology that were part of the compensation package.

Similarly, the surveyors talk about financial compensation package, advise in the breakdown of cash costs per family, so per unit this much cost, this much one has to look at because there is more to do with evaluation, there is more to the assessment. And planners which talk about the qualitative cost and the benefits of individual versus settlement. So, they look at the overall process as well as individual.

And here they talk about the construction methods; you know what kind of methods, prefab methods are we going to use, or some traditional methods we are going to use. So, I just briefly touch upon here and there. So, similarly the architects work with the social development agencies to carry out surveys with community groups and house because one has to understand that habitat mapping exercise.

Like for instance in Tharangambadi, Benny Kuriakose and his team, they work with the communities, they understood even when the Tsunami have struck they did not even get the area of which has been damaged, I mean which was an existing, so they need to involve the community people and so that is where who wants what, there is no documents left over sometime. So, how you have to make a record of that, so that is where a surveyor looks at.

And then you know they look at the participatory surveys, of course you can see some overlap here, and the engineers talk about the access and the provision of key vital services, how the water supply or sanitation has to be provided. So, like that here you can see that carrying out land surveys in concept planners, so they have to relate with the planners, hydrologist and the technical. So, if you are developing an inundation maps, how do you get the data of that inundation map? So, then the hydrological modeling people will tell you, you know what is the data they have done and how you can incorporate that in your modeling and how that can be informative decision-making level. So, this whole process has a multidisciplinary.

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Like for example, you can see in the immediate impact of the cyclone Hudhud, you can see the list of property damaged and the whole statistical information come to the district collectorate, so this is what our needs assessment is all about.

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And for instance, they have also identified which of the buildings have been damaged, which are partially damaged, which could be repaired.

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Like for example, in the compensation package, they talked about yes for a house we are giving you 5000 rupees for the repair but do you think it will cost 5000 rupees.

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So, now the reality is all these people are still living in the same house despite that 5000 was not sufficient, and this is where something goes wrong in understanding the need. Three families still live in the same house because whatever the meager amount is not, so there might be many various reasons or political reasons or the local reasons, but this is the reality. **(Refer Slide Time: 29:17)**



Similarly, the early recovery in transition one has to talk about the physical planning, the infrastructure. If there are roads damaged, if there are hilly terrains which were damaged, so how to build retaining walls, how to renew these things and the transition shelters and because they need to stay for some more months until their permanent shelter is designed. Property rights and claims, land boundary, cadastral survey, and the financial claims whoever have claimed that they have lost this; there is an insurance part of it.

So, this whole process will take, and even here you can see architects talk about establish the footprints of the dwellings and other typical key buildings and drop local area layouts and site planning and consider income. So, they have to engage with the community, they have to understand how the open and build spaces have been networked and similarly the surveyors provide a detailed contour level mapping.

And here that is where they talk about the transport facilities, the planners, they talk about the key networks of the services, and this is where they talk about if you have to implement any infrastructural input that is where they need to look at the civil works, you know the estimations, costing, the contract and tendering process. So, this is how the surveyor and the engineers will coordinate with each other.





And similarly in the reconstruction stage, we have the housing building design and this is where you can see the more of architects involved in it, how they design, the supervise and interface between infrastructure and building boundaries provide training and the delivery of it and the contribution of the communities in the low-cost models and advise on supervision, some guidance, providing some guidance, infrastructure planning and implementation.

So, this is what the built back better means opportunity to provide basic infrastructure services to high level of quality and amenity. Reconstruction is an important opportunity to design and deliver renewable energy, water transport, and waste infrastructure in an integrated way. Integration can produce several benefits, so disaster looks I mean disaster as an event, it is considered an opportunity to build back better.

So, we need to see how we can incorporate the waste management, energy. So there is also training programs, the planning and management and also defining within the given cent of land, 15 cents of land, how you are going to build 300 housing, how effectively you are going to go. So, this is where architect has to again coordinate with the surveyors and there is a macro-level coordination, when micro-level coordination works they have to interface.





And the last phase of post-reconstruction development review and you have the monitoring and evaluation. The problem here is people NGO's construct and they go away, who will review it, how their outcome is realized, how they have been experiencing and this is where a face-to-face interactions, how architect has to engage the community, what kind of gradual amendments they need to make and how to have a development control.

And similarly the project management works at cost-effectiveness and financial advice on depth servicing. If they have taken any kind of financial support, how we have to coordinate with that. And the maintenance advice: so, one has to look at both short and medium and long term maintenance strategies and infrastructure maintenance advice and retraining. So, tomorrow if some agency have developed a particular road and who is going to responsible after 5 years it gets damaged.

So, in that way, you have to look at the performance and the safety part of it. An audit has to be worked. So, that is where this whole process has been categorized with the architects, surveyors. I think you can, one can go through this report.

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And that will definitely help us to understand what are the various activities and which segments of time and what are the various professions, how they can correlate with each of their work. I hope this is helpful for you.

Thank you very much.