Vernacular Architecture
Lecture 7

Kashmir – Introduction

Kashmir as we already know is a paradise on land and it is famous for its hillsides, excellent water bodies, rich culture, Mughal gardens, Shikaras, Houseboats, handloom industry, its mouth watering cuisine. It is also an important aspect or a location in terms of movies, the socio cultural reason and the political aspects are all a very appealing thing such that it is being captured a lot in movies. Jammu and Kashmir is the top most state of India, it is surrounded by Himalayas, with China on one side and Pakistan on the other side. Pakistan occupied Kashmir on one side which has caused Pakistan and India to have a never ending and long battle. It basically comprises of three districts - Jammu, mainly a plain area. Kashmir, mainly a valley area. Ladakh: mainly a hilly area. The hills, the valley and the plain areas. Essentially these are three most dictating factors in the vernacular architecture of Kashmir. In this image, unlike other types of vernacular architecture, this typology dictates vertical growth of buildings, so you have two or three more storeys.

The evolution of the capital city - the river Jhelum played a very important role in the formation and development of the city of Srinagar. The city has developed at a number of sites on the banks of the rivers and canals formed by it. As much as in a desert, how rivers are important, even by the mountain side, the rivers are important and happened to be the life of civilizations. The network of canals extend through the city structure inward from the river's edge to the edge of Dal lake. The spatial structure of the city has evolved in harmony with the water bodies and topography. Climate and geography is the most important factor in shaping the vernacular architecture. The river's edge is defined by the buildings standing on retaining walls rising out of the water. The main movement spine is formed by the river and parallel streets on both banks, connected across by a series of bridges. Narrow cross lanes run perpendicular to the river. Most of it came along the river. This is a picture of Dal Lake.

We will directly study about a typical dwelling unit. The buildings were generally three to four storey high. When compared to the previous mansions or vernacular architecture, these are two to three storeys high with basements contained within the retaining walls along the river side. When we come to the topography that's steep and varied, the retaining walls are an important form of construction which was obviously prevalent than itself. The plans were generally square so that a minimum of external walls were exposed and heat was conserved in the cold winter. When you have a rectangular or a circular plan, it exposes a lot of your facade to the cold or the sun. The plans were generally square or little bit linear. Bay windows are present overlooking the river or the main street. Windows were thrown out for the views and to capture as much as heat as possible. The dub is generally located on the southern side so

that the sun was available in the winter. It was an important aspect in terms of climate to capture heat to keep the building warm.

Architectural Style

The architectural style of this dwelling unit is rather very old and is existent even today. Even though a lot of buildings are being pulled down. This vernacular architecture building techniques are sound proof because of various reasons that we will see.

The oldest surviving examples of traditional vernacular architecture in the city of Kashmir dates back to early 19th century. This architectural style is solely represented by the residences of the city and broadly falls into two distinct categories; based on the structural system involved. The housing or the dwelling unit were basically divided into two types and that is based on the structural system. These two systems are called; Taq construction system and the Dhajji-Dewari or Timber Braced system. These two conception techniques were the most important aspect of vernacular architecture. Why are these relevant even today is because Kashmir is prone to earthquakes. Not as devastating as in Japan but does have regular earthquakes and tremors. In order to learn from this by learning from their mistakes, by building and letting buildings be lost or ruined in earthquakes, they learnt slowly the technique to build earthquake resistant structures. The above two construction techniques are something that are very resistant to seismic activity. These buildings are very relevant today. They happen to be precious but are being pulled down in Kashmir. As professionals, as architects, it's our duty to understand these systems and maybe if we can't stop our political system from pulling down buildings, we should at least reuse these techniques in building of dwelling units in such areas.

We looked at two construction techniques, we will not look at each of them, for starters - the Taq construction technique. In this system of construction 2 - 3 feet thick brick masonry piers supporting wooden floor beams formed the basic structural system of the building. Imagine piers, piers are nothing but huge column based things. You have basic brick masonry piers. These columns make the walls or the enclosures between which spaces are formed. The space formed in between becomes the window. Brick piers with spaces in between, these spaces are either filled and closed or form the windows. The distance between two brick piers used to be normally around 3 - 4 feet and was known as the Taq. The Taq is nothing but the video, the gap in between each Taq would be filled in with either a window opening or brick masonry. The roof comprised a layer of Earth covering over birch bark and wooden planks resting on wooden rafters. You have wooden form or wooden planks that act as rafters, above which mud plastering or Earth covering is laid over with bench mark. This is the basis of the Taq construction. You have brick piers, these are based with wooden rafters that act as pier

platform and the space in between is filled with a window or a door, this is called the Taq construction.

We will move on to the Dhajji-dewari construction. This is nothing but a framework. The dhajji-dewari construction is based on a braced timber framed structural system. This is a simulated image of how a dhajji-dewari system works. You'd notice there is a wooden framework at the bottom that acts as the base on which 4 - 9 inch bricks or stone masonry is used to infill the gaps. Just above that layer, you notice bricks. Bricks or stone masonry can be used to fill these gaps and this forms the basic wall. This is called the Dhajji-Dewari system. Normally this system is limited to upper floor levels or attics, this is because these frameworks help resist seismic activities. The foundation of retaining walls or hold the main ground, even if that shakes, it usually doesn't break. The loose or framework sits tightly which is a good way to resist earthquakes. This is the Dhajji-Dewari construction, you'd notice the framework in which windows are made and also brickwork or stone masonry is filled. Next we move on to the spatial planning. Spatial planning is directly dictated by topography. Most of the building constructed above the mentioned structural system. This is the basic construction system that show a common spatial arrangement and therefore, relative decorative elements. The buildings can be divided into two categories - the square plan and the linear plan, these are the basic two types of plans which are aspects of the spatial planning. Many of the traditional buildings are based on a square plan with the main entrance opening into a centrally located staircase lobby. These buildings are used extensively in movies, if you had a chance to look at the movie 'Roja' directed by Mani Ratnam, we go into interspaces of the spatial planning of the Kashmir houses. You enter the building, the staircase is such an important part of the whole dwelling unit. You'd notice that the staircase is the central part, it opens into rooms rather than doors. Staircase goes directly into a room, that's how important the staircase is because vertical growth is an important aspect. The lobby is flanked by one or two rooms on either side on the ground floor as well as the first floor. The staircase is the main thing, in the movie, the terrorists take the protagonist around the place, there are two to three rooms that are wall less and open with temporary partitions. The space above entrance in first floor in some cases also encloses a projecting wooden bay window. Bay windows or very open windows that throw out views are very regular. The second floor normally comprises a single large hall which can be subdivided into three smaller rooms whenever required with the help of partition screens. It is actually an open plan around the staircase in which there are partition screens. This image is a sketchy version of that. You notice the staircase, around which the house comes around, the second floor has a sloped roof, it is just treated as the attic and can be used as rooms. This is an image of the same thing. This is the roof, another thing is the building materials that are used. You'd notice that the present day buildings have corrugated iron sheets as their roof because that is more easily available. Initially it is wooden or birch, Wooden drafter with burch but now it is

mostly CGI. The entrance to these buildings was from a staircase lobby located near one of the corners of the house. Many of the larger and more aristocratic houses also known as Havelis, comprise a linear, two or in certain cases three storey buildings. That's how it developed. Initially it was an aristocratic status to have three or four storeys but later with urban chaotic formation, it became necessary to go vertical. Lattice work screens and window shutters, profusely carved wooden brackets, are some of the main architectural elements associated with them. The second floor is surmounted by a cruciform shaped attic space. We've talked about spatial planning and dwelling units specifically, now we will talk about region specific architecture cause Kashmir dictates architecture in terms of region. We have talked about three regions; plains, valleys and hilly regions, that's how we will differentiate architecture within Kashmir.

Architecture by Region

Kashmir valleys are mostly rural areas. The major factors that dictate the local architecture in valleys are; easy to access good soil for brick-making and to water and timber; snow in winter; possibility of earthquakes. These are the three factors; the availability of the materials, the heavy snow that is going to settle on the roof and the possibility of earthquakes. Earthquakes are an important deciding factor. As a result, walls are made mainly out of timber, bricks, baked or unbaked. Soil was available, that resulted in baked or unbaked bricks. Timber which is locally available and the construction technique that was used where earthquake was not a concern was brick wall masonry with mud or cement water and unbaked bricks with mud water and mud plaster. This is very basic rural architecture. The Dhajji timber framed construction with infill of baked brick. As I said, you have wooden framework with baked bricks in cement mortar or unbaked brick masonry in mud mortar. Many structures which are typically single and double storey have Dhajji walls in the upper storey and the gables. You know what a gable is, the gable part of it is also filled with wooden framework and bricks. Roofs slope steeply in two directions. Basically, the role of a roof is to let the snow slide. Although planks or shingles of hardwood like Deodar were formerly the main roofing materials, today CGI sheets on timber supports have become the most common type of roofing. This is a typical valley or rural based architecture, one or two storeys high. You can notice clearly that the final roofing or the uppermost roofing are made from sheets. Corrugated iron sheets that became an important evolution.

Next we talk about the urban architecture in the valley. We talked about valleys and rural architecture, now we will talk about the urban architecture. The urban areas of the valley have architecture that is distinct from all other areas. Why? because we talk about vertical. Vertical growth or two to three storeys high is a bare necessity because of the urban condition. The main factor determining this architecture is the high density of development. This calls for

vertical growth. The two most common walling systems observed are - Dhajji type an Taaq type which we discussed earlier. Here we have a picture depicting the number of storeys, we have the retaining walls after which you have the next set of floors. The above constructions are clearly Dhajji. Architecture by region, Dhajji type - The timber frames in the Dhajji walls are generally well laid out with a system of diagonal bracings. Diagonal bracings other than just having gridiron basins was more effective, it provides a distinct path to the ground for the stresses caused by lateral seismic forces. In addition, the walls are lightweight and hence have less mass and less lateral seismic loads. When it comes to earthquakes, the lateral seismic load is important, the lateral seismic load is higher when there is a shake, the building mass tends to shake even more and gets destroyed but here it is lightweight and has less mass. Thus, this type of wall is able to withstand ground settlement and major earthquakes without suffering much damage. The Taaq type - the Taaq type has a large number of windows, Taaq means windows, the space in between two piers. One in each gap between the piers. The roofs are two and four sided pitched. The wood shingle roofing that was once used in most structures has been replaced by the CGI sheeting on account of economics and availability. Finally we talk about the Hilly areas. The major factors that dictate local architecture in this zone are in major contrast when compared to the ones in valley areas. Here, there is easy access to building quality stone. You won't be going for seventh mortar or break bricks as such, you can use stone that is directly available. There is limited availability of topsoil. Since it is a hilly area, the snow, the rain, the wind, takes away the topsoil regularly, that means that you can't use that soil since it is loose, it can't be used to make bricks. Varying availability of water, ranging from abundant to very little. The amount of water availability also determine the building typology, better availability of timber than in other zones due to lesser deforestation. In the hilly areas, deforestation is rather very less because the availability of timber is much more. Difficulty in carting, non local materials. In other cases, local materials or near by materials could be sourced but in hilly regions this is very difficult hence they keep to locally available or immediately available materials, heavy snow in winter and possibility of earthquakes. These are important factors and response they come up with is coursed random rubble masonry with or without mud mortar and Dhajji wall as we talked about. Historically, the flat roof has been the most popular on account of low snowfall. If there is low or minimum snowfall, flat roof is very good. But with the cost of timber escalating, this gives room for sheet which can be easily carried out.

House Boats – Dhungas

The unique character of Kashmiri architecture is the houseboats that are called Dhungas. It's actually a dreamy setting to have a house which is a boat but this is very common here. Living on a lake is one of the cheapest housing solutions in India. Living on a lake, living on a boat is a very cheap housing solution. Dhungas provide closeness to nature and is comfortable and pleasant even when the lake rises up in the winter. Essentially the Dongas don't sail away, the

boats are not in use. They are stationary in one place. It makes it very comfortable even if the water rises up. The houseboats in Kashmir are usually stationary. The Dhunga boats are more near the shore of Dal lake, floating on a sea of green weeds. The houseboats are generally made from local cedar woods. Boats are easy to make, a much lesser volume and space is occupied when compared to a dwelling unit. That's easily available, wood is used to make that. The houseboats are usually made from local cedar wood. Many of them have lavishly furnished rooms, with verandas and a terrace to serve as a sun-deck or to serve evening cocktails. It has moved from being a cheap solution to something of a very comfortable and a fancy setting. This is a houseboat, people just get onto the boat by climbing upon the staircase and that is how the boat is. It is stationary basically but it is a part of the house. The houseboats are made of wood and have intricately carved wood paneling. Vernacular architecture has evolved, first it was a boat, they lived in it, then they began to make it aesthetically pleasing by adding individual variety, the houseboats are of different sizes, some even have three rooms apart from a living room and kitchen, they are provided with a balcony in front with intricate carved pillars. Virtually every houseboat in Srinagar has been provided with a municipal water connection. From being vernacular architecture, it has been included in the corporation of the city, the government and the governing bodies and they've been provided municipal water connections. A portion on the roof can be propped open to enhance the circulation of air. These are still aspects of vernacular architecture, where you can still open the roof, this is not exactly always possible in a definitively designed piece of work. Most of the cooking in these houses is performed on the shore. Sliding shutters open for air and views. Adhesive vinyl partially covers the walls. These are more present day changes. This is a scenic pic of a houseboat. You see the weeds, the way people are supposed to enter, the balcony, the intricate carving of how it developed from a simple vernacular solution to a more intricately carved version.

Factors that govern the method of conception. We talked about how it can be a principle of design, how maintaining it can be an important aspect of vernacular architecture. We will be talking about it briefly. The factors affecting the popularity of construction methods and materials are economics, the money and the way to source it out, the maintenance of it and the response to local natural conditions. Its again climate, economic conditions and maintenance. Economics - this is demonstrated most clearly by the use of brick for construction, which is the most economical in the plains. The valley has soil, it is easy to make bricks, you can either have it baked or unbaked. The mountains on the other hand, offer very little soil but offer stone and rock. The economics dictated the architecture.

Moving on, we will talk about maintenance which is an important aspect. In vernacular architecture practical measures and procedural methods are already embedded in construction knowledge. When you apply construction knowledge, when you go forward to construct a

building in vernacular terms, you are doing it yourself, you know what the material is, how it works, how it stands, so it simply means you know how to maintain it and how it is durable. As local builders, they understood it in construction knowledge, they were actively involved and engaged in the building and maintenance of traditional built environments. Construction and maintenance was the same set of knowledge skills to them. Maintenance requires materials and skills. They are no different from what is required in construction. The maintenance of rural structures is easy and within the reach of the people of the lower economic strata. However, if materials from outside the locality were to be used, the maintenance of the structure would become expensive and then we go on to local natural conditions. Winter cold is the most important aspect, thick walls of brick and stone with mud plaster provide excellent protection against this, as does a thick mud timber roof. The lighter pitched roof made of timber and Corrugated iron sheets. The steep pitch of the light roof permits little accumulation of snow and prevents any water leakages. These were the three important aspects that affect the methods of construction. You can study more elaborately about the evolution of Kashmir architecture, it happened from the beginning when there was the topography that directly dictated architecture to present day individual variety that was applied. This is about the evolution of Kashmir architecture, you can go through it.