

Thank you Dr.Rathore. It's a pleasure to be here

When I was asked to talk about the forests of the Himalaya, initially I thought what is there to talk about. When you have forests that span vast mountain ranges, two and a half thousand kilometre stretch as we move from east to west, where you have precipitation patterns that vary from cold desert to some of the wettest places on earth, Where you have an altitude gradient that gives you everything from tropical, to subtropical, to temperate, how do you actually do a talk that encompasses all of these things and all of the extreme diversity that we have in the Himalayan region?

And then I thought I'd just talk of some points that I thought were important to talk about in these forests. So my talk is going to be 10 points.I am talking a little bit about the current, but much of the time I will spend talking about the future-the possibilities of what can be done and what needs to be done.

1. Forest cover is declining

Let's maybe start with the most obvious one, an important one but perhaps one that we all know about. But it's important enough that I will post it on two slides. Forest cover in the Himalaya is declining. This is happening both in terms of quantity and quality. I regard quality as being more important- the degradation of forest that is happening, the loss of dense forest cover. By some very good estimates, by the turn of the century, if current rates of degradation continue, the Himalayas will have only 10% of its land covered by dense forests. The definition here of dense forest is a fairly conservative one. Anything over 40% canopy cover is considered to be dense, whereas most Himalayan forests have over 80% canopy cover. Why is this happening? well, the picture is from the western Himalayas, Kashmir. Free use of these forests, the biotic pressure on these forests, from local communities in terms of fodder, fuel wood, fertiliser. there are of course other reasons as well. The other reason is the quantity of forest. that loss of forest cover is something that is better documented. The degradation of quality is not as well documented. The official figures often underestimate the loss of quality that is happening. Quantity is better documented, it's happening for a variety of reasons: hydroelectric projects which are built in large numbers, urbanisation is an important reason, building of roads, conversion of forests into Jhum lands. So that is one fact there.

2. Similar narratives across the E-W arc

Despite all the differences I've talked about in the Himalaya, there are similarities in narratives across the east to west arc. Chronic disturbance, a low-intensity repeated disturbance can be found in forests across the region. A weakening of community institutions, despite the projects that have gone into it, despite all the efforts that have been made, the general consensus is that community institutions have not become any stronger, they have actually degraded in the last few decades.

Developmental pressures. It's about good, about India becoming a richer country. Some of that has also been accompanied with higher developmental pressures, a much larger building of roads and other things across the region.

The fragmentation of forests. Now this is particularly important when you talk of things like climate change. Climate change requires a migration of species to areas of precipitation that are more appropriate to it. When forests are fragmented, this migration does not occur.

3. Recognition of ecosystem services.

Here's a slightly more positive one. The goods that come from forests have always been recognised such as the beautiful timber that comes from forests, the myriad biomass products and the non-timber forest products. But recognition of ecosystem services which has been there for a hundred years or more, its only in recent years that there has been a little more emphasis on them, particularly on the flood dampening effects of forests and the ability of forests to store carbon. This has become more important since the clean development mechanism came in, when it was thought that our forests could get money due to these international mechanisms. There has been some progress in monetizing these ecosystem services, Dr. Tolia and Dr.SP Singh were instrumental in securing payments for services rendered by forests.

so that is the background. There is a decline in forests, there is a decline in institutional mechanisms, and greater definition of ecosystem services. So where do we go from here?

That's a picture of the Himalayan arc with the rivers that flow from the Himalaya and support a billion people or so in the flood plains of the Ganga, the Indus and the Brahmaputra.

so what should we be doing? I am borrowing a line. 'We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect'. And keeping that in mind, I present the next seven points.

4. Forests are part of a varied landscape.

We need to recognise this fact, that they do not exist in isolation. They are part of the larger biosphere and the cultural landscape, the agricultural landscape all impact forests. Just legislation that bans the cutting of forests or planting seedlings of species that need to be protected is not enough. To protect forests, we need to empathise with real world needs of local communities and beyond. The picture there is of a mithun in Arunachal Pradesh, where we have a project of preserving large tracts of forest so that mithun can be kept there. And here's a picture from the Western Himalaya which shows the agricultural pattern which is so dependent on forests for fuel, fodder and leaf litter which provides fertiliser for the fields.

5. Get data.

Dr. Molden talked about this point, and it's extremely important. We desperately need data for the Himalayan forests. A recent IPCC report referred to the Himalayas as a 'white spot' due to the lack of data. Where data exists, it is often not reliable. Some climate change models I have seen actually use data from analogous forests. So we are using data from a forest which is perhaps in Europe, which is extremely different from Himalayan forests to model our current status. Unless we have the data, this will continue to happen. If we want payment for ecosystem services, if we want CDM credits, we need better quality data. One of the issues here is we need to strengthen institutional capacity. There has been, I'd say, a weakening of institutions like universities

across the Himalaya with a few exceptions and the students who used to be there to collect this data are dwindling. So collecting data is important

6. Not seeing the forest for the trees

Ecosystem structure and function, and ecosystem services are more than individual trees. We need to recognise this. We talk about degradation, but this may not just be at the canopy level. We need to talk also about things like trophic degradation where the loss of flora and fauna, or the increase of invasive species, lead to a decline in ecosystem functioning. In the western Himalaya where I do a lot of my work, we look at leaf litter removal as a fairly benign activity. But some work I had done with a student last summer showed that the mycorrhizal function- mycorrhizae are a fungus which help the tree roots expand so that they can get more water and nutrients-fell by 90% just by litter removal. These are attributes that we don't notice, but which are extremely important.

7. Think like a forest

Aldo Leopold whose picture I showed, talked of thinking like a mountain. We need to think like a forest here and work with nature rather than opposing nature. Forests are not agricultural lands where we can plant things and control the way plants grow. Those are plantations, perhaps of trees. Those are not forests. Do we always need to have nursery grown seedlings? Because in the western himalayas I see we plant saplings that have been planted in nurseries, raised in nurseries, then brought to the mountainsides which they are not adapted to. That's one of the many reasons they die. What about natural regeneration? Why are we not doing more of that in the Himalayan forests? In the plains we are still doing it. 6-7 years ago, we had developed a technique for direct seeding. We had just worked out the protocols. It was not rocket science there. We requested the forest department; they said it's not going to work. GIZ an NGO has worked on direct seeding in the western Himalayas and it has had excellent results. And the cost of that is less than 10% that of nursery grown seedlings. In the eastern Himalaya, people are talking of replacing Jhum cultivation with terraced agriculture. What about looking at something like analog forestry which has been tried in some parts of the world? Here ecosystem functions are retained. You create the structure of a forest, but rather than forest plants, you plant crop plants. That will preserve ecosystem structure and function and make a forest-like structure that will still provide a lot of services. The tree-root bridges of Meghalaya are an example of thinking like a forest where instead of building cement and wood bridges which are going to break in areas of high rainfall intensity, people use these tree roots of ficus and train them and build bridges which become stronger over time instead of weakening.

8. Reduce pressure on forests.

How do we do this? There need to be alternatives to biomass products. For hundreds of years, atleast in the western Himalaya, women have been climbing trees so that they can lop those leaves and bits of fuelwood so that their livelihood systems will function. Why can't we introduce more alternatives to biomass planting? All the hydroelectricity projects that have been built there, why cant a certain percentage be diverted to deliver clean energy to those villages where it is possible. Other forms of energy have also become more cost-effective. Where that is also not possible, at altitudes of 1500 to 1800

metres for example, biogas has worked extremely well. For 20 years in Uttarakhand, beginning on a very small scale, biogas has had extremely good results, but it is not something we have been able to scale up, for a variety of reasons. These kind of things will improve the health indicators- the respiratory and ocular problems and will reduce women's drudgery and the production of black carbon. These days black carbon is a big term everywhere because it is thought to be an important causative agent of glacier melt.

9. Modernise community forests

Largely community institutions have been talking of forest protection. But what about talking more about, and helping and training people in things like monitoring biodiversity in ways that can be monetized. When we talk of REDD benefits, those benefits should not flow to some central pool or to some nameless, faceless entity. There need to be mechanisms put in place where any benefits that come in actually help modernise the communities and the institutions there and help local communities get access to things like clean energy.

And finally in areas that are lower down, we say that they are over populated, but in areas that are closer to the high Himalaya, we actually want to prevent migration to a certain extent. Those communities are important for security reasons, are important to prevent things like poaching and hunting.

10. Increase awareness

That's why meetings like this are extremely important. I have put a picture of the IMI logo there. We need to move beyond technical and academic footfalls and engage with multiple stakeholders- policy makers, people from the political field, and NGOs.

So these are the points I want to share with you, and I leave you with a picture from Nagaland of a system that may or may not work- the Jhum system. We see a small habitation there and the forest around it.

Thank you.