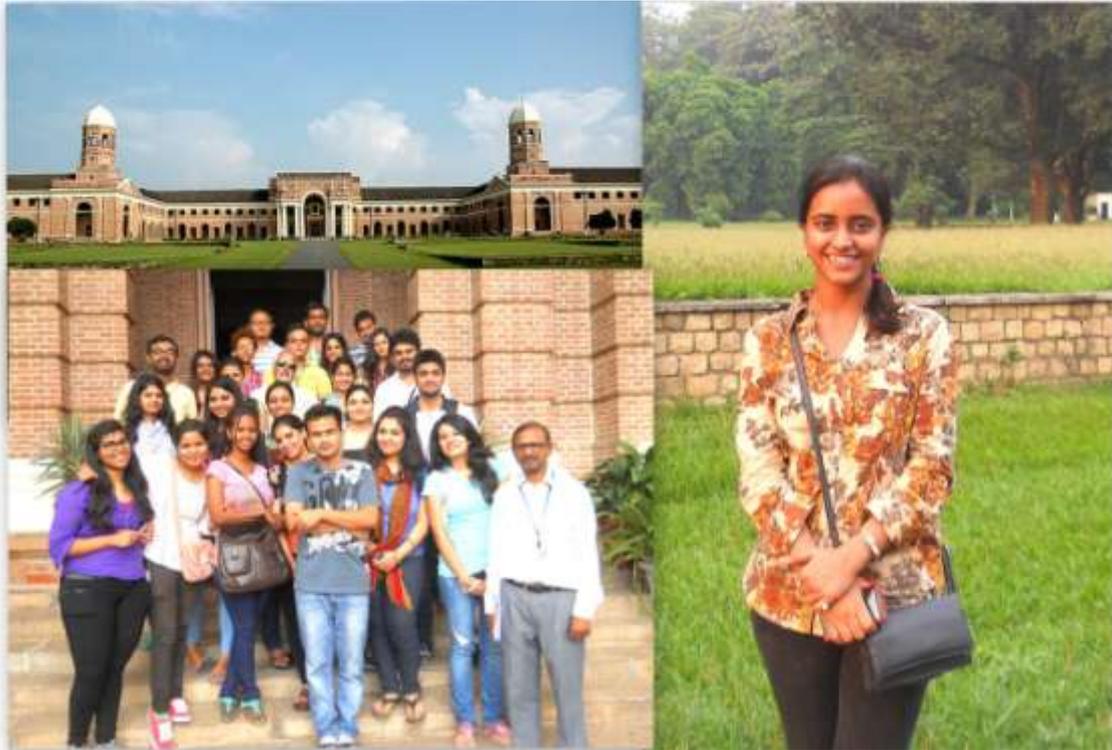


## **FIELD TRIP TO DEHRADUN-TEHRI**

*A Report on my learning and experience gained.*



**By-**

**SHOBHNA JHA**

**M.Sc Economics (First semester),**

**TERI University.**

**[Written before the trip as asked]**

What I expect to see and experience during Field trip?

I am grateful for the fortunate opportunity by TERI University for getting to visit Dehradun, Dhanolti and Tehri Dam as part of my field trip.

Hills have always been my favourite destination for any tripping so firstly, am very excited for the very idea of travelling and I am looking forward for lot of greenery and beautiful sight-seeing.

Secondly, the highlight for me in this trip would be visiting Tehri dam. I haven't visited it before and have only read in textbooks and over internet about it, being the highest dam of India. I expect that from our visit there, I would be able to understand more about the economics along working of a Dam and how a dam construction carries trade-offs with the livelihoods of people displaced/already living there.

I am also looking forward to our stay at Forest Research Institute and gather how it carries out the research especially into environment related issues. Have read about the magnificent architecture of FRI and its specialized research work into Forestry especially-so I am willing to explore about how it functions. Then Dhanolti Eco Park seems interesting especially the Deodar tall trees so am sure that will be a good adventure too.

I am expecting a lot of learning experience and fun with my friends.



## **DIARY OF ACTIVITIES**

S.No	Event/Activity	When & Where	Experience
1	Initiating stay at Scientist hostel, Forest Research Instt.(FRI)	22 sept- 25 sept' 14. Dehradun.	Breath-taking architecture, immense greenery.
2	Visiting Museums of FRI. (Silviculture museum, timber museum, on minor forest products, lastly on biodiversity)	22 & 23 sept' 14. Dehradun.	Excellent display of rare artefacts, well maintained. Great learning.
3.	National Forest Library & information Centre, Presentation of ongoing activities of FRI and interaction with heads of various divisions of FRI.	23 Sept' 14 Dehradun.	Exposure of what FRI does and consists of.
4.	Visit to UREDA	23 sept' 14, Dehradun.	Witnessed many innovative solar energised and water-channelled (renewable) devices.
5.	Dhanolti Eco park	24 Sept' 14 Dhanolti(on Mussorie-chamba highway)	Great interaction with the IFS officer and then trekking across the park. Enjoyed to the hilt!
6.	Tehri Dam	24 Sept' 14 on Bhagirathi river(near tehri, Uttarakhand)	Fortunate to get opportunity to visit the very interiors of Tehri Dam, witness so close the working and structures involved.
7.	Himalayan Environmental studies and Conservation Organisation (HESCO)	25 Sept' 14	Exposure to the work HESCO has accomplished and carries through its initiatives. Interesting learning.
8.	Wildlife Institute of India(WII)	25 Sept' 14	Nice knowing what WII does and how it carries its tasks based on 'demand' across India. The forensic lab was particularly interesting.

### *Connecting the Visits....*

The Forest research institute served a great place for our entire tripping stay. Not only the Scientists Hostel was well equipped-clean rooms, good food and courteous serving staff, the institute was spread across lush greenery all over and well maintained. Established since 1906, the most attractive part I felt about FRI was its museums and the Convention Hall-fully wooden and huge in build.

The day we reached, i.e. 22 sept' 14, we visited the four premiere museums at FRI-first, the Museum on Silviculture, second, Timber museum, third one was on minor forest products and lastly, we glanced the museum of bio-diversity and reserved species.

On 23<sup>rd</sup> sept (day 2), we did two main things-visited the various divisions of FRI and UREDA. The divisions included- Botany, Genetics and tree propagation Division, Forest Pathology, Pulp and paper division, Entomology and Ecology and Environment division. Every division offered something different to know and highly enlightening it was to interact with heads of those divisions, as knowledge for us. I especially liked the Pulp and paper division where we were shown how papers are made and then sheets generated through simple equipments and forest products. The other, UREDA-Uttarakhand Renewable Energy Development Agency, was a good visit where we saw various solar energy channelled and water-driven devices as- Solar still, Water pump, Energy Drum, Solar Cabinet driver, Wind battery charger, Dish type solar cooker etc.

24<sup>th</sup> Sept- Day 3, proved a long day for all of us. Starting at morning, 5.15am, we travelled 56 km, to Dhanolti Eco Park, where we initially were addressed by the IFS Officer-in-charge there and later got to visit the park and do full leisurely trekking. It was great fun. This was followed by our main part to the trip-visiting the Tehri Dam. For me, it was the biggest suspense and it just proved worthy. The blue-green Bhagirathi river, the sky-high mountains, lush green trees all over and those narrow scary with steep turn roads-all made reaching Tehri a big adventure in itself. Then inside the main dam, like getting such an opportunity was itself a golden chance and seeing through models and the actual turbines inside, it felt great to witness and know about the highest dam of India, so closely.

On 25<sup>th</sup> Sept, we visited firstly HESCO-Himalayan Environmental Studies and Conservation Organization. It was great to know how it had achieved milestones through all its initiatives and was continuing to produce great steps towards environmental conservation. Some of us even bought the products made by local ladies and it was great seeing how their models worked. Also in the afternoon, we visited the Wildlife institute of India. After briefly getting introduced from WWI's chief, the forensic lab of WWI had a lot to show us of what it carries as its projects through WWI members. Throughout the trip, we also have some leisurely breaks too-visit to Robber's Cave on 23rd and the Main market on 25<sup>th</sup> September!

Finally 26<sup>th</sup> Sept, starting early morning by 5am, we started for Delhi and bid bye to hilly Dehradun! Reached Delhi by afternoon, 2pm.

---



## Short Summaries (150 words) of each visit

**Stay at the Forest Research Institute, Dehradun:** FRI, having great architecture and immense greenery spread all over its campus, took all of us in awe-inspiring mode as we entered from the gates. Nearly each of us was out with our cameras! To catch the campus greenery in the lens of cameras was a sure delight. Ms. Smita, from FRI, could guide us through the museums and various divisions at FRI (discussed separately in visits to each museum and divisions). Not to miss, the Scientist Hostel, in which we particularly were allotted rooms to stay, was a very comfortable providence. They looked after each of our needs or any discomfort, prepared good food for us which surely made it a fine abode. Above all, with *Nandan Sir*, disciplined living (with respect to schedules of our visits) and so much learning while exploring through the entire tour was worth the experience.



### **EVENTS (in chronological order):**

#### ➤ ***Visit to the museums of FRI:***

- a) **Silviculture:** The first museum we visited was about “Silviculture”-the characteristics of trees. We could see soil conserving practises’ displays, like-contour trenching, step farming; exposure of soil to various kinds of climatic conditions-as how they react and behave in them. We even came across a model which was shown as about “skyline crane.” Consequences of destructions of forests were beautifully depicted. An interesting part I liked about this museum was the depiction of natural felling systems through illustrative models showing all the different stages involved. There were several maps all inside the museum, showing different forest types in India etc and also, eye-catching feature for all of us were the endemic species portraits which is rarely available so raw and accurate even on sources like internet.
- b) **Timber Museum:** It had a chart showing Deodar trees-704 years life scale, ‘Lantara’ made structures were carved out and put in display. This museum was full of maps, facts and location details where all timber is found in India and one interesting fact I found here-was- Water in woods, average is 16litre per 0.0283cubic metre of greenwood. One

fascinating feature inside were the Britishers' times seating arrangements reserved in form of chairs as they existed-suggesting, how old FRI is and it has lived significant times in Indian history too.

- c) **Museum of Minor forest products:** Here, we saw resins, turpentine-making process, *lac* (*Lacardia Lecca*)-which is found only in India, medicinal plants. I liked the guide sir present in this museum who could guide us very well through every forest product and vent our curiosity into meaningful knowledge for us. The Indian willow we could see, vegetable preserves of about 125 years were kept and last but not the least, extracts of Katha and cutch, gums etc all made the exposure worthwhile.
- d) **Museum on biodiversity:** This was a short visit as only some of us went in. Seeing skins' display of dead tigers, bulls, bears etc hung on those tall walls was something unexpected. This I felt was a *negative* thing to keep in museum, more so because for their idea to preserve them and keep for visitors' view- they had coloured and highlighted the flesh too! Also I learnt here about termites, 'pupa' stage how it is the most dangerous stage for growth of trees etc.

➤ ***Visit to National forest library and information centre(at FRI) and exposure to various divisions of FRI:***

On 23<sup>rd</sup> Sept, we went exploring the different divisions and started our point from CECBPT, the national forest library and information centre where we saw the information base of FRI-their library! Well this seemed like a 'teaser' to us, as with very little time in hand and seeing great books on book shelves every library, we were helpless due to paucity of time.

**Site #2: Wood science technology-** There, we learnt how Bamboo is more efficient than sal, wood etc. 'Lantara' has a lot of potential for use, still latent in use in India. There were Bamboo splitting machines to make bamboo mats, tiles etc. "Vinear" was a particular machine-50/60 years old, forms of plywood could be made, applying resins and their methods were explained to us. Interesting facts about Bamboo we got to know.

**Site #3: Cellulose and Paper division-** We learnt how tree log converts to chips through solution of sodium hydroxide and sodium and sulphide and converts into paper from pulp. Today as natural felling is completely banned, so much stress is on recycling and not using wood, that is why waste paper and baggies are used for pulp production. Thus the ratio in which wood and other materials are used is 1:3.5. There are processes of bleaching, screening, oil bathing(for optimization); devices as- CSF testers(to check water content-250ml), Air bath-digester, Beaters involved. In the end tensile-testings, smoothening, folding processes are conducted so that sheets of paper are finally made.

**Site #4: Tree Propagating and Genetics Activities:** Here we learnt about air layering, hybridization, plus trees of khair, successful grafting procedures. This division is 60 years old and in India, this idea was initiated here only.

**Site #5: Genetics:** We got to know about how their aim of study was to cut short the rotation period in trees and increase productivity, to study the gene character at seedling stage, 'resin' tap at later age for increased production. Also got to know about 'Timber forensics'-they used this strategy to do DNA matching of stump, for resolving theft cases. It was interesting to know about their fieldwork, First generation v/s second generation trunks (could see the difference!) and clonal reserves.

**Site #6: Botany Division:** Here after getting introduced from the head, we were led to the tissue culture lab. Problems with bamboo were discussed-as long flowering range or seeds very less frequent etc. Also got to know about 'Hybrids' plantation.

**Site #7: Ecology and Environment Division:** We had a good interaction here with 5 scientists, namely Dr. H.B.Vashishta, Dr. Laxmi Rawat and others. They explained how with present scenario, “Applied ecology and Applied forestry” are more into focus. They then discussed about their work-different stages of eco restoration of uranium mines, impact of mono cutting on site productivity and resource, restoration of biodiversity, Ecological urbanization impacts, Slope stabilization etc. Also in the end we visited certain labs-Nitrogen estimation lab, NPK, Chlorine estimation labs etc.

➤ ***Visit to Uttarakhand Renewable Energy Development Agency(UREDA):***

This was a short visit in the afternoon on 23<sup>rd</sup> Sept. Got to see certain solar energy’s using devices like-Photovoltaic cell, Wind-battery charger, Dish type solar cooker, Solar still, Solar cabinet driver, Water pump(working model!) and Energy drum. Here I felt a **negative** observation- seems talks for initiating renewable energies into regular use devices have been happening over decades now but when it comes to actual implementing and establishing them, they lag behind due to heavy cost issues. So eventually they are not very feasible and practical solutions to our energy requirements even today are void and unreachable to many pockets of India. Their cost implications cannot be ignored and these ideas, no matter how fancy they seem, showing “conserving environment” steps, they are not practical rather only theoretical ideas! Also UREDA was completely lying vacant, no travellers, visitors could be seen so all in all, it felt the ideas of renewable energy use which it was fostering, was going waste.



< Solar panels.

➤ ***Visit to Dhanolti Eco Park:***

This was one of the most delightful of all our visits. Dhanolti-located amidst thick Pine, Deodar and Rhododendron forest with excellent weather, served an inspiring place for us after knowing its historical transforming story. The IFS Officer-in-charge explained in detail to us about how the very place which looked so green and beautiful was once nothing, but a garbage bin! Dhanolti has worked upon itself with the help of Community based Natural Resource Management (CNBRM). Its twin objectives-promoting community participation in conservation of biodiversity and second, enhancing livelihood opportunities for the rural people was deeply reflected when we visited the park itself. The attractive part to me was the Revenue sharing system. How the entire project was self-sustaining as the proceeds were divided, say if 100% is total revenues-40% goes to community people, 30%-maintenance costs, 20%-to govt and 10% as corpus funds to committee. In the end, we went to the actual park-there, trekking along the narrow paths carved inside the park was almost of a stretch of 3-

4 kms. Thus, this visit's input I felt was- "Good will" development and ultimately people's participation to implement a project/idea is most crucial for its success.



<< *Budding mushrooms*

### ➤ *Visit to the Tehri Dam:*

On 24<sup>th</sup> Sept, finally wait got its sweet result when we reached Tehri town and our eyes met the beautiful blue-Bhagirathi river from a distance notifying us that Tehri Dam has come! A rock-filled dam, knowing about Tehri Dam's history was very enlightening. We were told about everything as four aspects of Tehri Dam- *Historical, Technical, Spiritual and Rehabilitation*. Historically, it was with Russia, India had a dream that they decided to build the largest dam, in 1947. 1948 October, agreement was signed for Tehri and the process even started by 1949 December; just to get delayed due to several bottlenecks one after other. In the end, it was actually by 1995, India got control for Tehri in their hands and in 10years 1000MW Tehri dam was ready, i.e. by 10<sup>th</sup> October, 2006-handed to the Govt. Of India. Technical details were told about Tehri dam like the upstream, downstream heights, length and width dimensions etc. It has a carrying capacity volume of 35 Lakh cubic water- surely qualifying it as the largest dam in India.

The real experience came when all of us actually went inside the 16 levels deep, main undergrounds of Tehri Dam. We got to know inside about the role of transformer, gas insulation switchyard, role of PSP, security and safety norms(through Central security forces), Ventilation chamber, Butterfly valve chamber, Head raise tunnel and tail raise tunnel, Shute spillway(longest downstream-220m). It was fascinating to know about the 7-gate system of Tehri dam and the fact it supplied electricity of about 8900 million units per day.



➤ ***Visit to Himalayan Environmental Studies and Conservation Organisation(HESCO):***

On 25<sup>th</sup>, we visited HESCO-a non profit organisation which just got established in 2013 and works for Himalayan regions' environmental issues. Each of us was quite inquisitive to know how their efforts and organization were something different than other NGO's etc in Uttarakhand. HESCO is quite effective because of Dr. Joshi's work which was presented well through an electronic presentation to us. Indeed it was enlightening to know their milestones in terms of their innovative approach towards environmental conservation-'Kisan Bank', WISE, Environment conservation approach, Technology Research Centre for hilly areas, CIC programme with incorporating Switzerland's approach, Lantana craft encouragement, Portable biogas plants, Organic farming formation(focussing on long term stability),Vermi-composting, Isotope Application Technology(since 1992), Ion chromatography, Water storage tank cum research tank.

Two things caught my attention, especially- Food Park for wild animals: these wild parks were developed specially with such plantations which man could not consume! Second, their effort for women-WISE and almost like self help group-kisan banks(micro financing). Enabling the local women training, making simple eatables like-edible jams, honey, apple & chilly pickles-this is really a simple yet powerful step towards women empowerment too.



➤ ***Visit to Wildlife Institute of India(WII):***

The last of all visits, we visited WII on 25<sup>th</sup>, in the afternoon. WII has a beautiful architecture. After quick introduction from one of WII's prominent professors, we got to know about WII more-being an autonomous institute, how it maintains its mandate of-teaching various courses along with research. WII works "on demand" basis, regarding wildlife issues all around India. They explained their "*camp driven*" methodology and how they prepare several stage-wise reports: like Feasibility report, Implementation report depending upon the issue concerning wildlife. Lastly, we were led to the WII's forensic lab which proved quite interesting to all of us. There they showed fake v/s real ivory, a Rhino's horn, canine teeth and many other structures. That was an entertaining cum enlightening learning for all of us. We even visited the sub-labs where real experiments were being conducted and some students were carrying their practical research works.

---

### **Summary on whether there has been any change in my understanding and knowledge in comparison to that I had before the Trip:**

Yes. Indeed I experienced a suitable change and boost to my understanding and knowledge through the entire trip. Before the trip, I had in mind, it would be more of a theoretical 'know-how' of the several organisations we were visiting-like the HESCO or even FRI. So basically nothing new it would be, I thought. But when we covered the itinerary, one-by-one, starting from FRI itself, it served a great exposure. Whether at the divisions and museums of FRI or while visiting the interiors of Tehri Dam, every visit offered unique insight to look at our own depths of knowledge in a more profound way. At every visit, there were more than one fascinating learning like learning about Bamboo's importance or getting to know the innovative ideas of HESCO towards environmental conservation. Then Dhanolti Eco Park, I merely thought it would be a leisure trip before visit, but getting to know its real reason-its success story on actual visit was a great realization for me-as to how for success, years of planning & joint efforts go into its making. How implementation carries lot of *checks and balances*, how sustainability comes into picture-so keeping the carrying capacity of the potential resource always in mind-these parameters' importance are so crucial to study.

What I learnt most importantly was a pragmatic angle to our already existing or the new offered knowledge. Also, before the trip, I had no idea about Tehri Dam and that we would visit so close, but on actual visit, it was great exposure, learning and surely an unforgettable experience. Tehri Dam being an inspiring model was great booster to my understanding of actual working of a Dam, the economics in planning which went behind building while the rehabilitation issues with it-all served great learning. The biggest change I felt, for myself was regarding the Forest Research institute(FRI). Having heard about the architecture and its divisions, I was only sure it would be good to 'know' and visit. But the intricate details and knowledge we were offered eventually was a remarkable experience. Not only the heads at various divisions were so interacting, guides inside museum were well informative to guide us well and the campus was so green. We even interacted with some students studying already at FRI there and got to know how difficult (due to leopards and other wild animals) their studies were, still they loved it. It was their spirit which made me realise how knowledge is worth seeking it in every possible way we can. Their dedication towards their work, whether the Researchers at FRI or the students, was highly motivating for me.

Being in Classical dance(Kathak) field, for over 14 years, I have visited many places, about 10 countries by now, so one of my special intuitive desire was to learn as much, for every day as a different experience and indeed it was so fulfilling and fun. It has been one of those trips where I could enjoy practical learning-a sure break from theoretical classes, or for me, dance performance's tensions to bear!

I thoroughly enjoyed our trip.

---

### **My learnings from the Trip-personal, social, institutional:**

I had significant and worthwhile learning, during the entire trip. Starting from our visit and stay at FRI, to interacting with my field-trippers and with Nandan Sir-to covering every decided visit as per itinerary, I am simply foremost thankful to TERI University for giving me this wonderful opportunity to know some of my University mates closer and gain a pragmatic exposure to knowledge.

Being M.Sc Economics student, this trip helped me to garner my concepts in areas as implementing policy decisions or innovative planning needs through our visits to HESCO or the Dhanolti Eco Park. This could be at *the 'academic' level* for me.

On the *'personal'* count, I felt inspired by Nandan Sir's approach of disciplining and mentoring us, regarding time sense, punctuality, every visit's significance, responsibility, our food needs and demands etc. He himself is much disciplined which inspired I think each one of us to be sincere towards our project and intended study on field trip. Even Gupta sir-both were always readily available to any student's grievances till the very end of our trip.

On *'social'* account, I made good friends with many of our field-tripper mates. Not with every single student travelling, perhaps because we were from multiple courses and some had other priorities to visit this trip (more for leisure), so I could honestly connect with few by the end, who were really interested in listening keenly in every visit, learning at every point-I felt myself more connected with few friends. Throughout I loved to expand my knowledge base and understanding. It was great knowing each other, overall through the trip.

On *'institutional'* account, FRI was simply grand. It not only felt like exposing us to the work and ethos at FRI, but also getting to learn about the lifestyle of researchers, who devotedly work for environment, particularly trees. The manner in which it was maintained was remarkable given its more than 100 years of establishment and huge forest areas, wild animals spotting issues etc. Then Wildlife institutional institute was also a nice visit as we got to know about its actual working, management, being an autonomous institution. HESCO was another good an experience to know how local people participation promoted self reliance along with sustainability ideas to deal with Environment issues. That was inspiring that if such ideas develop into institutions in every needy corner of India, problems shall be nothing but all in man's control and so the cure would be so easy. Of all the visits, I loved visiting Tehri Dam-an institution with at par architecture, rock solid design, and profound innovative successful project.



Thanks to TERI University, Faculty teachers for this wonderful opportunity.

---



***A note:***

*All the above details of my Report are purely my own observations, ideas, pictures and understanding to the best of my knowledge.*