Dr Ajith Kumar's association and passion for Sikkim Himalaya: pioneer in initiating conservation biology research and developing human resources in the region

Dr. Ajith, Sikkim and biodiversity: an introduction

A series of hydropower projects were commissioned along the Teesta River spanning northern parts of West Bengal and Sikkim during the 2000's. A multidimensional study to assess the carrying capacity of the Teesta River basin in Sikkim was conceptualized by experts representing different institutes across the country in 2002. The project was funded by National Hydro-electric Power Corporation (NHPC), through the erstwhile Ministry of Environment and Forests (now Ministry of Environment, Forest and Climate Change), Government of India and coordinated by Prof. Maharaj K. Pandit from the Centre for Interdisciplinary Studies of Mountain and Hill Environment (CISMHE), Delhi University. Salim Ali Centre for Ornithology and Natural History (SACON), based at Coimbatore was one among the partner institutes and was entrusted to undertake the faunal component in the project. Hence, SACON took up a sub-project titled "Ecology of Mammals, Birds, Herpetofauna and Butterflies along Teesta River Basin in Sikkim" in which Dr. Ajith Kumar was the Principal Investigator along with Dr. Lalitha Vijayan and Dr. S. Bhupathy as Co-Investigators. Soon, with his passion for wildlife and the Himalayan landscape, Dr. Ajith initiated the project in Sikkim with his keenness for biodiversity and developing human resources for wildlife research.

Dr. Ajith envisioned building local human resources in Sikkim Himalayan Region

An advertisement was published by SACON in Employment News in April 2002 with a call for various project-based research positions. SACON is a national institute and is mandated to recruit staff from across the country through national advertisements. However, Dr. Ajith knew that recruiting local people and making them skillful will be of immense value in the long run as those people will continue working for the region's welfare even after the completion of the project.

Additionally, the Sikkim Himalaya, which also includes adjoining Darjeeling hills was not much given attention with regard to higher education in general, and wildlife biology and ecology research in particular. Hence, he wanted to conduct the interview for the selection of project staff (four research fellows and one project scientist) at Gangtok, the capital town of Sikkim. This arrangement was made by SACON (may be for the 1st time) with a sole aim of giving opportunity to young minds of the region, who otherwise would miss attending the interview if held in Coimbatore.

Consequently, the interview was held in the month of July 2002 at Sikkim Government College, Tadong (now Nar Bahadur Bhandari Government College), and as envisioned by Dr. Ajith, out of five positions four got selected from the region (three from Darjeeling and one from Sikkim). Sikkim, a tiny Himalayan state, lacked higher educational institutes then (except few degree colleges and one or two private universities). Hence, this multidimensional multi-institutional project by leading institutes (including SACON) of the country provided opportunities for aspiring candidates who wished to undertake higher studies, especially research leading to a PhD degree. We were among few others (associated with other institutes) to be

a part of the project, and blessed to be mentored by Dr. Ajith and other investigators.

Our journey with wildlife biologist

Initial interaction

Our first interaction with Dr. Ajith Kumar was in July 2002 at Gangtok during the project interview. As mentioned above, Dr. Ajith's main aim was to develop human resource on wildlife biology research from Sikkim and nearby areas, and therefore, we got an opportunity to work with him. Being a lead PI, he had a major role in recruitment, and implementation of the project. We could not understand him much until we visited SACON in the 3rd week of August 2002 for formal paperwork and initial training. Dr. Ajith was excited and happy to have us in the project. We did not have any prior research experience and were clueless what to do next. We travelled around 3000 km away from home with a goal of doing PhD but did not have any idea how it can happen. But after meeting Dr. Ajith and other project PIs, we got some solace and started feeling confident. Within no time, we became friendly with Dr. Ajith and started learning basics of wildlife biology research. We have so many fond memories of working with him, and he has immensely contributed in building our careers (see details in the inset boxes 1, 2 & 3).

Field-based training and exposure tour to Valparai and Varagaliyar: Tropical Rainforests in Western Ghats

All of us were completely new to scientific research, including wildlife biology. In order to provide basic training and exposure to the subject, Dr. Ajith organized a field trip to the tropical rainforest in Western Ghats. We started from his house at TVS Nagar, near SACON in the afternoon, and after travelling for a few hours, reached Valparai when it is almost dark. In this remote location, we were welcomed by Sankar Raman and Divya Muddapa, both mentored by Dr. Ajith. After a simple dinner, we had a chit chat on wildlife research, including the ongoing Sikkim project.

Early morning the next day, we started from Valparai to Varagaliar. We were also accompanied by Sankar Raman and Divya Muddapa. On our way while walking, Dr. Ajith kept on teaching about mammals, birds and plants. He would pluck a plant's leaf, smell it and tells us the name, indicating his rich expertise about the biodiversity of the area. After a few hours of walking, there was a heavy rain, and we were completely drenched but then the only option was to walk with all the materials (including eatables) loaded at the back. Since we had no prior field experience, we did not even have rain coats, hence all our items (including spare clothes) got completely wet. We reached the old forest rest house at Varagaliar where Dr. Ajith stayed while doing his research on Lion-tailed Macaque (*Macaca silenus*) for his PhD.

Tired of walking the whole day, with clothes all wet, and cots with dilapidated mattress to sleep, we thought "*Wildlife research is very tough*", and wondered if we will be able to continue? But the next day we realized that we were in a rainforest with almost 100% canopy cover, multilayered vertical stratification, a highly biologically diverse region which was very memorable. We learnt bird watching and identification techniques, and could sight some unique and rare species. We also could observe some butterflies, mammals including elephants, reptiles including Hump-nosed Pit Viper (*Hypnale hypnale*), etc. This is how Dr. Ajith initiated and imparted research skills to us.

Biodiversity research along Teesta River Basin in Sikkim

The main aim of the project in Sikkim was to understand the distribution and diversity of major faunal groups along the Teesta River Basin. Dr. Ajith minutely planned all aspects of the project, including setting up field station at Dalep, South Sikkim, obtaining the research permit, taking us to

Figure 1: Dr Ajith with researchers from Sikkim at the high altitude Gurudongmar Lake (5200 m) in August 2003. Standing (Left to Right, Sophio Riphung, Bhoj Acharya, Basundra Chettri, Dr. Ajith Kumar and Joya Thapa). Sitting (Left to Right, Field Assistant Dil Bahadur Chettri, Driver Buddha Tamang).

different parts of Sikkim (especially along Teesta basin) and training us on various aspects of wildlife ecology research. After that, he made many visits to Sikkim to follow up whether we were on the right track. We traveled to several places in east, south and north Sikkim exploring and selecting study sites, including high altitude cold desert and wetlands (Fig. 1). Despite his specialization on mammals, Dr. Ajith had immense knowledge on plants, birds and herpetofauna. One of his most peculiar traits is he never gets tired of walking and explaining things. Our field sessions lasted for 10-12 hours during the day time, followed by night sessions on flying squirrels and frogs. While he sometimes appeared tough, he used to refresh us with his humorous jokes and intermittent laughs.

Sikkim Project research findings and outcomes

Studying biodiversity in terms of what exists where and how common or rare they are would serve the purpose of the project, as it was envisioned to understand whether any unforeseen consequences will impact biodiversity along Teesta River due to commissioning of the dams. This would have been quite straight forward and easy research involving surveys in different locations along River Teesta. But Dr. Ajith desired deeper understanding on biodiversity trends, and guided us to explore biogeographical patterns along elevation gradients. Sikkim, located in the western extremities of the eastern Himalaya, is one of the smallest states of India (geographical area 7096 km^2). Within this small geographical span, the elevation changes from around 300 m at the lower valleys to >8000 m at the summit of Mt. Kanchendzonga, the third highest peak in the world (Acharya and Sharma, 2013). Due to changes in elevation as well as other biophysical characteristics, the climate changes from hot tropical type at lower, mild temperate type at middle and arctic cold at higher elevations.

The temperature declines with increasing elevation with a lapse rate of -0.62°C at every 100 m rise in elevation (Acharya et al, 2011a). Similarly, there is a clear gradation of vegetation which transitions approximately at every 900 m interval (Acharya et al, 2011a). Due to such a high vertical zonation of

biological, physical and climatic characteristics within an aerial distance of ~100 km, Sikkim creates an ideal situation to test several biogeographical hypotheses. Therefore, as part of the project, we designed our study to understand the elevational patterns of different faunal groups along the Teesta River basin in Sikkim. Additionally, we also delved into exploring causal mechanisms of the elevational patterns.

We covered various vegetation types and elevation sites (Fig. 2) spanning steep landscapes, deep gorges and valleys (Fig. 3) in Sikkim. While our permanent field station was established at Dalep busty, South Sikkim (near Singtam town), we travelled across the valley moving up and down on seasonal basis encompassing diverse vegetation types and high elevation ecosystems (Fig. 3) to collect data from set transects and established plots (Fig. 2). Extensive field-based study for more than three years showed different patterns for different faunal groups. Butterflies declined with increasing elevation showing high diversity below 1000 m and very few species above 3000 m. Reptile diversity also followed declining trend with elevation having no species above 3000 m. Similarly, birds and amphibians followed unimodal pattern with highest diversity at middle elevation, around 2000 m. Mammals showed unique bimodal pattern with two peaks- one between 500-1000 m elevation (tropical semi-deciduous forests) and the other one at 3000-3500 m (temperate coniferous forests). One of the interesting findings of the study was high turnover rates (beta diversity) exhibited by all taxa showing unique faunal communities at each elevation zone.

Additionally, most of the species had narrow elevation range, and were restricted to specific elevation site/zone (Acharya et al, 2011b, Acharya and Vijayan, 2015, 2017; Chettri et al, 2010; Khatiwara et al, 2023; Vijayan et al, 2006). One of the most significant achievements of the project was discovery of one snake species new to science

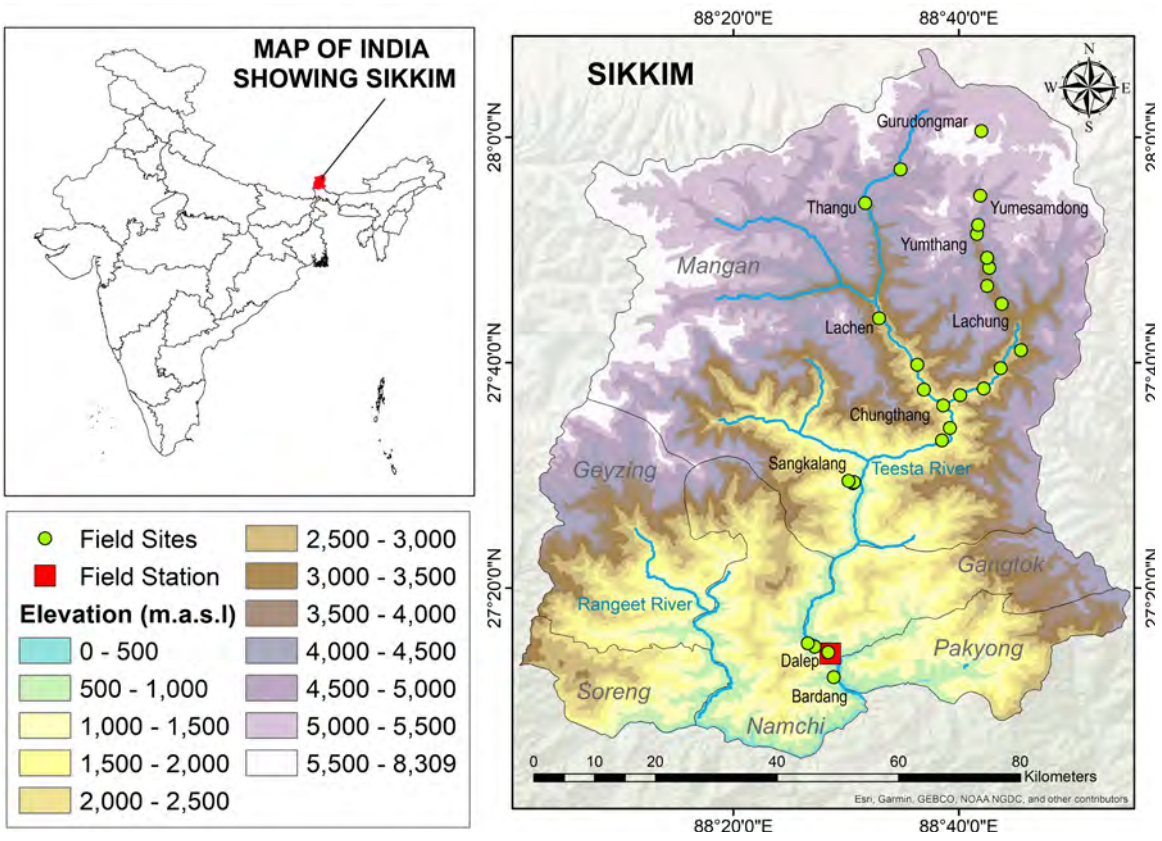

Figure 2: Map of Sikkim showing field station and sampling sites spread along elevation gradient in the Teesta Valley.

Figure 3: Some unique landscapes covered during the study in Sikkim Himalaya. (Clockwise from bottom right, Waterfall near Bob, Chungthang, Mighty Teesta near Chungthang, Cold Desert near Gurudongmar Lake)

Box 1: Reminiscences by Bhoj Acharya

I had just completed my MSc in early 2002 and was looking for job opportunities, hence I did not realize what it meant to work with a person like Dr. Ajith. The most interesting initial experience for me was how he removed teacher-student barrier, most importantly the fear and uneasiness of being with teachers. Dr. Ajith treated us like his friends and created a fear free environment for learning which really helped us to build confidence and move forward with research. He is the one who introduced me to the basics of research, taking us to field in different parts of Sikkim and Western Ghats, explaining ecological details in the field during day time, and teaching statistics in the evening. Since then, he constantly guided, motivated, encouraged and monitored progress as a real guru and fatherly figure till his last breath. He was a passionate photographer and never missed clicking birds, mammals, plants as well as people's activities in the field (Fig. 4). He also loved driving, and used to drive the Marshall jeep purchased for the project activities (Fig. 4).

Six months after joining the project, I got a job with the Government of Sikkim, and wanted to leave the project. Hearing this news, Dr. Ajith was sad as it was his dream to make me a wildlife biology researcher/scientist (he often used to laugh and say, 1st from Sikkim). He held several counselling sessions, tried his best to explain about my future with research, and strongly motivated me to leave the job and continue with the research. After 1-2 months of indecisiveness, I got convinced and finally decided not to join the job, and that is why I am here today. Now I realize what an invaluable gift Dr. Ajith presented to me and my family. He has crafted my career in higher studies.

Dr. Ajith was one of the most lively and joyous persons I have ever met. His humorous, friendly nature and empathetic approach have touched and changed many lives including mine. I am personally so blessed and fortunate to have him as my Guru as he has contributed so much to shape my career as an ecology researcher. There are very few people in this world with whom I am so dearly connected, and Dr. Ajith is of course one among them. I deeply miss Ajith Sir, and his place in my life is irreplaceable.

Box 2: Reminiscences by Basundhara Chettri

My entry into the field of wildlife ecology is merely a coincidence, however my journey ahead was much shaped by Dr Ajith Kumar. During selection interview conducted by SACON in 2002, I had submitted a write up indicating my research interest on Himalayan Salamander, with no prior idea how and what I am going to do. After selection, we had orientation in SACON, followed by field trip in Annamalai hills. I came to know Ajith Sir during our trip to Valparai and Varaglair. He tried to expose us to the extreme conditions which is to be expected in the subsequent field work. Using different approaches, he used to teach us how challenging yet rewarding wildlife studies are.

Spending two months in SACON, we returned back to Sikkim to initiate our field work. Though we established field station at Dalep, South Sikkim, we used to move altitudinally up and down covering all the seasons. Ajith Sir was instrumental in the initial phase of our research journey, helping us in identifying field sites and sampling, establishing contacts with local communities and concerned authorities including researchers and scientists from various institutes. Since our project had different faunal components, he made sure we learned about other taxa and also the vegetation. He was the only PI who had visited all the field sites spread across the altitudinal gradients in Sikkim.

Meanwhile, as soon as the project was initiated, our research permit was cancelled. Even after several round of discussions and persuasions with the concerned authority, he could not convince them why this research project was important. After coming to field station he narrated the whole story and told us not to worry. In the same evening, he started calling several scientists and institutions related to our field enquiring about research positions to engage us. He felt deeply responsible that we should not get lost on the way. But later, the permit issue was solved and we could complete our research work. His cheerful and humorous persona, made the most difficult and serious issue easily approachable.

As a teacher, he made sure that everybody participates and learns. For a person like me, this was very important to come forward. When I look back, my research journey is largely shaped by Ajith Sir. For me, his association and guidance was not limited to PhD but continued much later. Sir, you are gone too early and your guidance and support will be missed in many of our research discourse.

Figure 4: Some glimpses of biodiversity and field based memories associated with Sikkim project. (A) Camera Trapped picture of Masked Palm Civet (*Paguma larvata*); (B) Group of Nepal Gray Langur (*Semnopithecus schistaceus*) in North Sikkim; (C) Setting Sherman traps at a trapping site; (D) Project personnel in a field site; (E) Blue Whistling Thrush (*Myophonus caeruleus*), one of the most common bird species found in the study area; (F) A jeep purchased by the project, and often driven by Dr. Ajith while in Sikkim. Three photographs (D, E and F) were taken by Dr. Ajith Kumar.

Box 3: Reminiscences by Joya Thapa

During the interview of selection of Junior Research Fellows, the barrage of questions started very randomly from the panel with "*Can you name 100 mammals? And your time starts now*" After naming few large mammals, I happen to mention Civets and Martens, that's when I heard him speak "*which species?*" with eyes all lit. I did not even know who's who in the panel then but later came to know that he is none other than Dr. Ajith Kumar, the PI of the project. In his words, "*Sikkim is unique because when you travel from north to south, the distance is only about 100 kms but the wide altitudinal range and a high gradient make it an exciting field to study compared to any other place in the world*". The twinkle in his eyes whenever he spoke about Sikkim was not to be missed. We were all amateurs to the technical aspect of wildlife studies, but his patience was commendable. Though I had worked with ATREE (Ashoka Trust for Research in Ecology and the Environment), Eastern Himalaya Programme in Environment Education, he ensured I attend other courses and meet people from the field as well. Our first trip in the wild with him included his favourite place in the Anamalai hills. We stayed in the Varagaliar forest guest house. The tropical forest was new to us, but with Ajith, the experience was different. Naturally, the realization that there is so much to learn from him became stronger, not knowing that the inspiration would continue not only throughout the project, but throughout our lives.

Once back in Sikkim, loaded with Sherman traps, camera traps, loads of papers and books photocopied from SACON library, high altitude gears etc., we camped up in the field station in South Sikkim and started sampling around in the reserve forests. The initial camera trappings didn't yield much barring few shots of Masked Palm Civet (Fig. 4) and Jackal (***Canis aureus***). Tree shrews in my traps really excited Ajith as well as the night transects looking for flying squirrels. We were to lay the Sherman traps in grids but it was a near impossible task due to the steep terrain. Hence, he came up sampling in trap lines, so we laid 30 to 60 traps at a distance of 5 m along the line-transect. We made our first trip to Gurudongmar Lake with him and the visible difference in vegetation was evident during a day's drive from Singtam (426 m) to Thangu (3962 m) where we halted. The next morning after using fire to heat up the diesel tank of the vehicle, we reached Gurudongmar (5425 m).

With the project work not progressing due to the delayed permissions, he helped me write up a proposal of studying *Semnopithecus schistaceus* in the higher altitudes for which we were to apply for funding. We had sighted a group of them around Lachen area during one of our trips to the north (Fig. 4). However, once the permissions came through, we got busy with tasks that remained to be done for the project. In another instance, around Chungthang, one of my transect would have a very high density of small carnivore scats. The first time, he stunned us by just cleaning the scat and eating one of the seed and told us the family to which the seed belonged. It was a very dry scat with many different fruit seeds visible. I could never emulate that, but it was simply an example of his dedication to the field of wildlife and conservation. During the course of our field study, he had moved from SACON Coimbatore to taking charge of the MSc Wildlife and Biology course in Bengaluru, and formally was not part of the project, but in field, we never felt the change. His guidance as well as our well-being was looked into by him.

Once the exciting field work was completed, the thesis writing period resumed when I had the opportunity to stay in Bangalore. He ensured I was camped up in the guest house meant for the visiting faculty of MSc Wildlife Programme. I wasn't alone in any sense, the first few batches of MSc students had hostels (actually houses) around in the vicinity. Besides, I had the opportunity to meet all the distinguished faculty and enormously benefited from the discussions that used to take place in the evening with the students. He always ensured that I was around for these discussions.

At some point, the project report was submitted then the stipend stopped as well. For support, he employed me with the MSc course to coordinate their classes in NCBS, faculty etc. However, he ensured that I was working for only half a day, the rest of my time was alloted to wrap up my thesis.

Today, when I look back, he was one of the very few persons who has had such a remarkable effect on my life. It is indeed a big loss for me and many others; both professionally and personally. Ajith Sir always remained a humble mentor with high ethical standards with deep empathy and kindness, along with his trade mark of resilience and perspective and most importantly authentic.

(Pan et al, 2013), and rediscovery and taxonomic revalidation of one unique lizard species (Bhupathy et al, 2009).

The findings of the project highlighted rich and unique biodiversity of Teesta basin, and invited immediate conservation attention. The report clearly revealed the fragile nature of the valley, and recommended prohibiting large-scale developmental activities above 1500 m elevation i.e. above Chungthang town in North Sikkim (Vijayan et al, 2006). The findings of the project work led to three PhD theses (Acharya, 2008; Chettri, 2007; Thapa, 2008), and several publications (Acharya and Vijayan 2009, 2010; Acharya et al, 2009; Acharya et al, 2010; Acharya et al, 2011a,b, Acharya and Vijayan, 2015, 2017; Chettri et al, 2009; Chettri et al, 2010; Chettri and Acharya, 2020; Khatiwara et al, 2023). While many individuals have relentlessly worked to contribute to these biodiversity knowledge products, Dr. Ajith conceptualized the whole study and was the main propelling force behind this feat.

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