

Bhutan school hosts international workshop on biodiversity science and conservation

As an exciting addition to our CLP project, "*Schools-based, science-based, participatory approach to conservation in Bhutan*", in March 2023, Phuntshothang Middle Secondary School hosted its first ever international biodiversity workshop. Four experts from UK and Austria, together with members of the local Forestry Department, joined our school for 10 days. They trained our CLP project team, selected teachers, Forestry Department officers, and over 100 pupils in different aspects of biodiversity science. The focus was on hands-on, immersive study, with the aim of encouraging pupils to consider a career in science/conservation. This has advanced and complemented the extensive work on bats and birds that has already been undertaken as part of this on-going project.



Dechen Choden (Class 9, aged 15) holding a White-rumped Shama which was collected in one of the bird nets

The international workshop included four components:

1: Scientific methods of Bird Survey

As part of the CLP project's citizen-science initiative, Dr Swen Renner of the Natural History Museum, Vienna, a renowned expert in ornithology and biodiversity conservation trained our team (including one Forest Department officer), teachers, and pupils in the theoretical and practical aspects of scientific bird surveys. The objective was to provide data on the birds, forest

cover, and conservation needs of Deothang Important Bird Area (IBA). This IBA is situated adjacent to the school.

Working within strict scientific protocols, and guided by Dr Renner, the older children (14 to 18 year olds) took it in turns to become ‘ornithologists’, setting mist nets, observing and identifying birds, and helping to process blood samples on microscope slides (for the study of DNA and parasites). Dr Renner trained the teachers and pupils to gather accurate and reliable data based on a systematic approach.

Through learning the scientific methods employed by Dr Renner, we have ensured that our team, together with the pupils, will continue to gather data that will contribute significantly to our understanding of the avian biodiversity within the Deothang IBA, including species diversity and richness, migration, ecological interactions, and avian diseases. The data collected will be instrumental in informing conservation strategies, habitat management plans, and policy decisions aimed at preserving the area’s rich birdlife.

2: Lesson-in-Box

Beatrix Lanzinger of the Harrison Institute joined schoolteacher Ms Tshering Yangzom and her colleagues to conduct a highly impactful workshop on the development and implementation of a 'Lessons-in-a-box' environmental programme. This is a totally new concept for the Bhutanese education system. The aim of this initiative is to assist schools by providing comprehensive well-structured lesson plans in conservation and environmental protection that are tailored to the local context, aligned with the curriculum, and which can be easily transferred from teacher to teacher, and school to school.

The lesson plans incorporated interactive and multisensory activities to make learning a fun and engaging experience for the children and included art, performance, and film. At the end of the workshop, 24 children, aged between 7 and 9 years old, performed a song about trees to the whole school (some 972 pupils and 80 staff).

As a result of the workshop, the school is committed to developing, implementing, and disseminating lesson plans through its Nature Club to other teachers and other schools. This will ensure its continuity and sustainability. The programme will serve as a valuable resource for

teachers and educators, enabling them to incorporate interactive and experiential learning activities into their curriculum.

3: Remote Sensing and Landscape Ecology

Dr Marcela Suarez-Rubio of the University of Natural Resources and Life Sciences, Vienna introduced the team members, 4 staff of the Forest Department and 20 children (14 to 18 year olds) to the theory and practice of remote-sensing. Despite the challenging nature of the subject, the pupils responded with enthusiasm and intelligence. Working on 10 laptops in the school's computer room, they performed a series of tasks to gain practical experience of GIS. Dr Suarez-Rubio taught the pupils and colleagues from the Forest Department how to analyse remote sensing data using state-of-the-art software to assess forest cover within the project area. Participants were provided with the necessary skills to interpret remote sensing imagery, allowing them to identify different land cover types, vegetation density, and changes over time. Through this process, Dr Suarez-Rubio emphasised the importance of utilizing technology to gather accurate and reliable data for conservation planning. This is particularly relevant in our understanding of land management and conservation strategies in Deothang/Narphung IBA.



Over 20 pupils attended the various remote sensing classes

4: Communication and outreach

As part of a wider programme in communication and outreach, Dr Paul Bates of the Harrison Institute introduced over 30 staff and pupils to the fundamental principles of photography, composition techniques, and tips for capturing stunning images of wildlife and the natural environment. The learners were captivated by Dr Bates's engaging teaching style and his ability to simplify complex concepts. Through practical demonstrations and hands-on activities, he encouraged the participants to explore their creativity and experiment with different camera settings and angles. They learned how to capture the intricate details of flora and fauna, the play of light and shadow, and the essence of the natural world. The photography session not only honed the technical skills of the participants renowned for his expertise in photography and conservation, brought his wealth of knowledge and experience to guide our learners in the art of capturing the beauty of nature through the professional lens to the school level.



Dr Marcela Suarez-Rubio of the University of Natural Resources and Life Sciences Vienna set the pupils in remote sensing a range of practical tasks on the computer

Conclusion

The feedback from the Nature Club members and staff was overwhelmingly positive to all four activities. All expressed their gratitude for the opportunity to learn from experts in the field and were inspired to continue their exploration of the natural world and its conservation.

Leading the project has greatly progressed my science and conservation network within Bhutan and internationally. Within Bhutan, I have been regularly communicating with colleagues in NBC (National Biodiversity Centre), RSPN (Royal Society for the Protection of Nature), and with various government ministries. I am currently looking to develop further this relationship and am exploring the idea of an honorary research position in an in-country NGO.

Internationally, our team has expanded its network. Recently, I was appointed an Honorary Research Fellow of the Harrison Institute, UK. I have developed a close and very valuable scientific collaboration with the Natural History Museum, Vienna and the University of Natural Resources and Life Sciences, Vienna.

My colleague, Ms Tshering Yangzom, and myself have been discussing the possibility of undertaking an MSc and PhD respectively as part of this citizen science programme. Ms Tshering Yangzom is interested to study an aspect of pedagogy – for example, the role of children in delivering scientific data for conservation. My study would focus more on changes in bird diversity and composition within natural and disturbed forest habitats.

I am immensely proud of our team and our pupils. The international workshop has been the highlight of the project so far in terms of impact and profile. However, the project has also been collecting numerous data on the bat and bird fauna of Deothang IBA over the previous months. It has genuinely enthused school pupils, especially those in the Nature Club and hopefully some of these may become part of a new generation of young scientists. In addition, we have all learnt that the forests of Deothang IBA (our home environment) is rich in rare and globally threatened biodiversity, including three conservation dependent species of hornbill.

I thank our international colleagues for their support (scientific and financial) and their encouragement. I look forward to growing and developing this project over the coming years.

(To learn more about the international workshop, please see the YouTube video -

<https://www.youtube.com/watch?v=Xj-TMaWC87A>)

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Figure 1. Recording bird data in the field



Figure 2. Rigden Samdrup (Class 9, aged 15) setting a bird net



Figure 3. Dechen Choden (Class 9, aged 15) holding a White-rumped Shama which was collected in one of the bird nets



Figure 4. Class 9 pupils using binoculars in the field



Figure 5. Dr Swen Renner of the Natural History Museum, Vienna showing pupils how to measure birds in the field



Figure 6. Younger pupils of the Nature Club learning about trees (part of the training for Lessons-in-a-box)



Figure 7. Twenty-four younger pupils of the school's Nature Club took part in the Lessons-in-a-box training



Figure 8. Beatrix Lanzinger (centre) with pupils of the Nature Club; they are drawing and labelling trees as part of the training for Lessons-in-a-box



Figure 9. Pupils of the Nature Club drawing and labelling trees as part of the training for Lessons-in-a-box



Figure 10. Young Nature Club members received certificates for their participation in the workshop



Figure 11. Over 20 pupils attended the various remote sensing classes



Figure 12. The pupils in the remote sensing class were set a range of practical tasks on the computer



Figure 13. Dr Marcela Suarez-Rubio of the University of Natural Resources and Life Sciences Vienna set the pupils in remote sensing a range of practical tasks on the computer



Figure 14. At the end of the workshop, 17 pupils were awarded certificates for participating in all the remote sensing classes



Figure 15. Teachers and pupils learnt how to take photographs with smartphone and camera



Figure 16. Pupils and teachers celebrate the commitment of the school to a Green Bhutan