

Robert John Chandran

Professor of Biological Sciences

Current Appointments

<i>Position</i>	Professor Department of Biological Sciences Indian Institute of Science Education and Research Kolkata Mohanpur - 741246, West Bengal, INDIA
<i>Position</i>	Adjunct Fellow Ashoka Trust for Research in Ecology and the Environment Bangalore - 560064, Karnataka, INDIA

Personal Details

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<i>Website</i>	www.iiserkol.ac.in
<i>Birth</i>	August 04, 1968. Chennai, INDIA
<i>Family</i>	Married with one son

Academic Qualifications

Ph.D. Tropical Forest Ecology Indian Institute of Science, Bangalore. Supervisor: Professor Raman Sukumar Thesis Title: Habitat associations, density dependence, and tree species diversity in a tropical dry deciduous forest in Mudumalai, southern India	1993-2000
M.Tech. Chemical Spectroscopy Indian Institute of Technology, Delhi.	1991-1993
M.Sc. Chemistry Indian Institute of Technology, Delhi.	1989-1991
B.Sc. Chemistry, Ecology, Botany St. Joseph's College, Bangalore University.	1986-1989

Academic Appointments

Professor 2024 - Present	Indian Institute of Science Education and Research, Kolkata
Associate Professor 2018 - 2023	Indian Institute of Science Education and Research, Kolkata
Assistant Professor 2010 - 2018	Indian Institute of Science Education and Research, Kolkata
Faculty Fellow 2007 - 2010	Ashoka Trust for Research in Ecology and the Environment, Bangalore

Post-doctoral Experience

- Post-Doctoral Fellow** University of Illinois, Urbana-Champaign, USA
Supervisors: Dr. James W. Dalling and Dr. Kyle E. Harms
2004-2006
- Post-Doctoral Fellow** Smithsonian Tropical Research Institute, Panama/USA
Supervisors: Prof. Stephen P. Hubbell and Dr. Richard Condit
2003-2004
- Post-Doctoral Fellow** University of Georgia, Athens, USA
Supervisors: Prof. Stephen P. Hubbell
2001-2003
- Research Associate** Indian Institute of Science, Bangalore, INDIA
Supervisor: Prof. Raman Sukumar
2000-2001

Publications

- Bhowal, S., Banerjee, S., & **John, R[#]**. (2026). Three Decades of Grassland Emergence in the Terai–Duar Savanna and Grasslands Ecoregion: Patterns and Drivers. *Annals of Botany*, mcag051. <https://doi.org/10.1093/aob/mcag051>
- Baruah, G., Barabás, G., & **John, R[#]**. (2025). When Do Trait-Based Higher Order Interactions and Individual Variation Promote Robust Species Coexistence? *Ecology and Evolution*, 15(4), e71336. <https://doi.org/10.1002/ece3.71336>
- Bhowal, S., Banerjee, S., Das, D., & **John, R[#]**. (2025). Fire, anthropogenic influence, and habitat factors affect grassland persistence in the face of woody encroachment in a Terai-Duars savanna and grasslands habitat. *Environmental Monitoring and Assessment*, 197(8), 971. <https://doi.org/10.1007/s10661-025-14425-4>
- Yang, Q., Zhang, Z., Zhang, H., Yang, H., Pandey, S., & **John, R.** (2024). The contributions of rainfall and fog to leaf water of tree and epiphyte communities in a tropical cloud forest. *Frontiers in Plant Science*, 15. <https://doi.org/10.3389/fpls.2024.1488163>
- Zhang, H., Li, Y., Xu, Y., & **John, R.** (2024). The recovery of soil N-cycling and P-cycling following reforestation in a degraded tropical limestone mine. *Journal of Cleaner Production*, 448, 141580. <https://doi.org/10.1016/j.jclepro.2024.141580>
- Banerjee, S., Das, A., Rahman, M., Bhowal, S., Das, D., & **John, R[#]**. (2023). Grass fires and road structure influence plant invasions in a critical wildlife habitat in north-eastern India [Publisher: Cambridge University Press]. *Environmental Conservation*, 1–9. <https://doi.org/10.1017/S0376892923000024>
- Banerjee, S., Das, D., Zhang, H., & **John, R[#]**. (2023). Grassland-woodland transitions over decadal timescales in the Terai-Duar savanna and grasslands of the Indian subcontinent. *Forest Ecology and Management*, 530, 120764. <https://doi.org/10.1016/j.foreco.2022.120764>
- Zhang, H., Liu, X., & **John, R[#]**. (2023). Editorial: Key determinants of biodiversity, ecosystem functioning and restoration in climate change sensitive ecosystems. *Frontiers in Ecology and Evolution*, 11. <https://doi.org/10.3389/fevo.2023.1297617>
- Banerjee, S., Niyogi, R., Sarkar, M. S., & **John, R[#]**. (2022). Assessing the vulnerability of protected areas in the eastern himalayas based on their biological, anthropogenic, and environmental aspects. *Trees, Forests and People*, 8, 100228. <https://doi.org/10.1016/j.tfp.2022.100228>
- Das, D., Banerjee, S., Lehmkuhl, J., Krishnaswamy, J., & **John, R[#]**. (2022). The influence of abiotic and spatial variables on woody and herbaceous species abundances in a woodland–grassland system in the eastern terai of india. *Journal of Plant Ecology*, 15(1), 155–167. <https://doi.org/10.1093/jpe/rtab080>
- Niyogi, R., Shekhar Sarkar, M., Shekhar Niyogi, V., Hazra, P., & **John, R[#]**. (2022). Habitat connectivity for conserving cervids in a multifunctional landscape. *Journal for Nature Conservation*, 68, 126212. <https://doi.org/10.1016/j.jnc.2022.126212>

- Banerjee, S., Das, D., & **John, R[#]**. (2021). Grassland vegetation and roads have dominant influence on decadal-scale spatial-temporal patterns of fires in a species-rich protected terai habitat in northeastern india. *Agricultural and Forest Meteorology*, 304-305, 108411. <https://doi.org/10.1016/j.agrformet.2021.108411>
- Niyogi, R., Sarkar, M. S., Hazra, P., Rahman, M., Banerjee, S., & **John, R[#]**. (2021). Habitat connectivity for the conservation of small ungulates in a human-dominated landscape [Number: 3 Publisher: Multidisciplinary Digital Publishing Institute]. *ISPRS International Journal of Geo-Information*, 10(3), 180. <https://doi.org/10.3390/ijgi10030180>
- Sarkar, M. S., Niyogi, R., Masih, R. L., Hazra, P., Maiorano, L., & **John, R[#]**. (2021). Long-distance dispersal and home range establishment by a female sub-adult tiger (*panthera tigris*) in the panna landscape, central india. *European Journal of Wildlife Research*, 67(3), 54. <https://doi.org/10.1007/s10344-021-01494-2>
- Xue, Y., **John, R[†]**, Liu, X., Wang, X., Su, S., Tan, Z., Yang, Q., He, Q., Jiang[‡], K., & Zhang, H. (2021). Rocket launching activities are associated with reduced insect species richness and abundance in two types of tropical plantations around the wenchang satellite launch center, southern china. *Ecological Indicators*, 127, 107751. <https://doi.org/10.1016/j.ecolind.2021.107751>
- Cheng, Y., Zhang, H., Zang, R., Wang, X., Long, W., Wang, X., Xiong, M., & **John, R.** (2020). The effects of soil phosphorus on aboveground biomass are mediated by functional diversity in a tropical cloud forest. *Plant and Soil*, 449(1), 51–63. <https://doi.org/10.1007/s11104-020-04421-7>
- Rath, S., Banerjee, S., & **John, R[#]**. (2020). Greater tree community structure complexity in sacred forest compared to reserve forest land tenure systems in eastern india [Publisher: Cambridge University Press]. *Environmental Conservation*, 47(1), 52–59. <https://doi.org/10.1017/S0376892919000390>
- Das, D., Banerjee, S., & **John, R[#]**. (2019). Predicting the distribution and abundance of invasive plant species in a sub-tropical woodland-grassland ecosystem in northeastern india. *Plant Ecology*, 220(10), 935–950. <https://doi.org/10.1007/s11258-019-00964-7>
- Sarkar, M. S., Niyogi, R., Hazra, P., & **John, R[#]**. (2019). *Panna landscape corridor connections: Fine scale assessment of tiger (panthera tigris) connectivity networks in the panna landscape, madhya pradesh*. Madhya Pradesh State Biodiversity Board.
- Zhang, H., **John, R.**, Liu, K., Qi, W., & Long, W. (2019). Using functional trait diversity patterns to disentangle the processes influencing the recovery of subalpine grasslands following abandonment of agricultural use [Publisher: Frontiers]. *Frontiers in Ecology and Evolution*, 7. <https://doi.org/10.3389/fevo.2019.00128>
- Kanade, R., & **John, R[#]**. (2018). Topographical influence on recent deforestation and degradation in the sikkim himalaya in india; implications for conservation of east himalayan broadleaf forest. *Applied Geography*, 92, 85–93. <https://doi.org/10.1016/j.apgeog.2018.02.004>
- Rath, S., & **John, R[#]**. (2018). What factors influence the abundance and distribution of sacred forests in odisha, a densely forested state in eastern india? *International Journal of Environmental Studies*, 75(4), 553–564. <https://doi.org/10.1080/00207233.2017.1406731>
- Sarkar, M. S., Pandey, A., Singh, G., Lingwal, S., **John, R.**, Hussain, A., Rawat, G. S., & Rawal, R. S. (2018). Multiscale statistical approach to assess habitat suitability and connectivity of common leopard (*panthera pardus*) in kailash sacred landscape, india. *Spatial Statistics*, 28, 304–318. <https://doi.org/10.1016/j.spasta.2018.07.006>
- Zhang, H., Chen, H. Y. H., Lian, J., **John, R.**, Ronghua, L., Liu, H., Ye, W., Berninger, F., & Ye, Q. (2018). Using functional trait diversity patterns to disentangle the scale-dependent ecological processes in a subtropical forest. *Functional Ecology*, 32(5), 1379–1389. <https://doi.org/10.1111/1365-2435.13079>
- Zhang, H., **John, R[†]**, Zhu, S., Liu, H., Xu, Q., Qi, W., Liu, K., Chen, H. Y. H., & Ye, Q. (2018). Shifts in functional trait–species abundance relationships over secondary subalpine meadow succession in the qinghai–tibetan plateau. *Oecologia*, 188(2), 547–557. <https://doi.org/10.1007/s00442-018-4230-3>
- Das, A. A., **John, R.**, & Anand, M. (2017). Does structural connectivity influence tree species distributions and abundance in a naturally discontinuous tropical forest formation? *Journal of Vegetation Science*, 28(1), 7–18. <https://doi.org/10.1111/jvs.12474>
- Zhang, H., Zhu, S., **John, R.**, Li, R., Liu, H., & Ye, Q. (2017). Habitat filtering and exclusion of weak competitors jointly explain fern species assemblage along a light and water gradient [Number: 1

- Li, R., Zhu, S., Chen, H. Y. H., **John, R.**, Zhou, G., Zhang, D., Zhang, Q., & Ye, Q. (2015). Are functional traits a good predictor of global change impacts on tree species abundance dynamics in a subtropical forest? [00000]. *Ecology Letters*, n/a–n/a. <https://doi.org/10.1111/ele.12497>
- Zhang, H., Qi, W., **John, R.**, Wang, W., Song, F., & Zhou, S. (2015). Using functional trait diversity to evaluate the contribution of multiple ecological processes to community assembly during succession. *Ecography*, 38(12), 1176–1186. <https://doi.org/10.1111/ecog.01123>
- Krishnaswamy, J., **John, R.**[#], & Joseph, S. (2014). Consistent response of vegetation dynamics to recent climate change in tropical mountain regions. *Global Change Biology*, 20(1), 203–215. <https://doi.org/10.1111/gcb.12362>
- Baldeck, C. A., Harms, K. E., Yavitt, J. B., **John, R.**, Turner, B. L., Valencia, R., Navarrete, H., Davies, S. J., Chuyong, G. B., Kenfack, D., Thomas, D. W., Madawala, S., Gunatilleke, N., Gunatilleke, S., Bunyavejchewin, S., Kiratiprayoon, S., Yaacob, A., Supardi, M. N. N., & Dalling, J. W. (2013). Soil resources and topography shape local tree community structure in tropical forests. *Proceedings of the Royal Society B: Biological Sciences*, 280(1753). <https://doi.org/10.1098/rspb.2012.2532>
- Baldeck, C. A., Kembel, S. W., Harms, K. E., Yavitt, J. B., **John, R.**, Turner, B. L., Chuyong, G. B., Kenfack, D., Thomas, D. W., Madawala, S., Gunatilleke, N., Gunatilleke, S., Bunyavejchewin, S., Kiratiprayoon, S., Yaacob, A., Supardi, M. N. N., Valencia, R., Navarrete, H., Davies, S. J., ... Dalling, J. W. (2013). A taxonomic comparison of local habitat niches of tropical trees. *Oecologia*, 1–8. <https://doi.org/10.1007/s00442-013-2709-5>
- Dalling, J. W., Schnitzer, S. A., Baldeck, C., Harms, K. E., **John, R.**, Mangan, S. A., Lobo, E., Yavitt, J. B., & Hubbell, S. P. (2012). Resource-based habitat associations in a neotropical liana community. *Journal of Ecology*, 100(5), 1174–1182. <https://doi.org/10.1111/j.1365-2745.2012.01989.x>
- Zhang, H., **John, R.**, Peng, Z., Yuan, J., Chu, C., Du, G., & Zhou, S. (2012). The relationship between species richness and evenness in plant communities along a successional gradient: A study from sub-alpine meadows of the eastern qinghai-tibetan plateau, china [Publisher: Public Library of Science]. *PLOS ONE*, 7(11), e49024. <https://doi.org/10.1371/journal.pone.0049024>
- Anitha, K., Joseph, S., **John Chandran, R.**, Ramasamy, E. V., & Prasad, S. N. (2010). Tree species diversity and community composition in a human-dominated tropical forest of western ghats biodiversity hotspot, india. *Ecological Complexity*, 7(2), 217–224. <https://doi.org/10.1016/j.ecocom.2010.02.005>
- Dalling, J. W., & **John, R.** (2008). Seed limitation and the coexistence of pioneer tree species. In W. P. Carson & S. A. Schnitzer (Eds.), *Tropical forest community ecology* (pp. 242–253). Wiley-Blackwell.
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- John, R.**, Dattaraja, H. S., Suresh, H. S., & Sukumar, R. (2007). Fire in tropical dry forests: Results from a long-term study in mudumalai, southern india. In *Proceedings of a national workshop on forest fires in india* (pp. 101–106). Ministry of Environment; Forests.
- Wills, C., Harms, K. E., Condit, R., King, D., Thompson, J., He, F., Muller-Landau, H. C., Ashton, P., Losos, E., Comita, L., Hubbell, S., LaFrankie, J., Bunyavejchewin, S., Dattaraja, H. S., Davies, S., Esufali, S., Foster, R., Gunatilleke, N., Gunatilleke, S., ... Zimmerman, J. (2006). Nonrandom processes maintain diversity in tropical forests [Publisher: American Association for the Advancement of Science Section: Report]. *Science*, 311(5760), 527–531. <https://doi.org/10.1126/science.1117715>
- Uriarte, M., Hubbell, S. P., **John, R.**, Condit, R., & Canham, C. D. (2005). Neighborhood effects on sapling growth and survival in a neotropical forest and the ecological equivalence hypothesis. In D. F. R. P. Burslem, M. A. Pinard, & S. E. Hartley (Eds.), *Biotic interactions in the tropics: Their role in the maintenance of species diversity* (pp. 89–106). Cambridge University Press.

- John, R.**, Dattaraja, H., Suresh, H., & Sukumar, R. (2002). Density-dependence in common tree species in a tropical dry forest in mudumalai, southern india. *Journal of Vegetation Science*, 13(1), 45–56. <https://doi.org/10.1111/j.1654-1103.2002.tb02022.x>
- Sukumar, R., Suresh, H. S., Dattaraja, H. S., **John, R.**, & Joshi, N. V. (1999). Mudumalai forest dynamics plot, india. In *Tropical forest diversity and dynamism: Findings from a large-scale plot network* (pp. 551–563). University of Chicago Press.
- John, R.** & Sukumar, R. (1999). Distance- and density-related effects in a tropical dry deciduous forest tree community at mudumalai, southern india. In E. Losos & E. G. Leigh (Eds.), *Tropical forest diversity and dynamism: Findings from a large-scale plot network* (pp. 363–383). University of Chicago Press.
- John, R.**, Tyagi, R., & Gupta, M. N. (1994). An insoluble aggregate of commercially available bovine serum albumin shows antiproteolytic activity. *Biochemistry and Molecular Biology International*, 33(2), 263–272. <https://europepmc.org/article/med/7524898>

corresponding author; † joint first author

Teaching (Undergraduate and Graduate levels)

Ecology <i>Ecological principles: Environment, Interactions, Populations, Communities</i> 2021 - present	Indian Institute of Science Education and Research, Kolkata
Plant Sciences <i>Plant Ecophysiology and Plant ecology</i> 2011 - present	Indian Institute of Science Education and Research, Kolkata
Biostatistics <i>Probability and Modern Statistical Methods</i> 2011 - 2019	Indian Institute of Science Education and Research, Kolkata
Scientific Communication <i>Science Writing and Presentation</i> 2011 - 2018	Indian Institute of Science Education and Research, Kolkata
Terrestrial Ecology/Forest Ecology <i>Communities and Ecosystems</i> 2008 - 2009	NCBS Bangalore and ATREE Bangalore
R Programming and Data Analyses <i>Data analyses in Plant Community Ecology</i> 2001,2002,2003	STRI/CTFS Workshops, Bangalore, Panama, Cambridge

Fellowships and Grants

Principal Investigator. *Recent decadal-scale changes in land use/land cover in the Terai-Duar Savanna and Grasslands Ecoregion: Implications for terrestrial carbon cycling and plant biodiversity.* **Rs. 54,24,013.** Funded by: Anusandhan National Research Foundation (ANRF), Government of India. (Mar. 2025 - Feb. 2028).

Principal Investigator. *Investigating adaptive strategies of forest trees to temperature and water stress to inform climate-resilient forestation in central India.* **Rs. 44,90,000.** Funded by: Scheme for Translational and Advanced Research in Sciences (STARS), Ministry of Education, Indian Institute of Science. (Oct. 2023 - Sep. 2026).

Principal Investigator. *Monitoring Biodiversity and Ecosystem Services for Ecosystem Enhancement under the Green India Mission: Phase 2.* **Rs. 64,71,000.** Funded by: Madhya Pradesh State Biodiversity Board, Government of Madhya Pradesh. (Jan. 2023 - Apr. 2024).

Principal Investigator. *Monitoring Biodiversity and Ecosystem Services for Ecosystem Enhancement under the Green India Mission.* **Rs. 44,72,049.** Funded by: Madhya Pradesh State Biodiversity Board, Government of Madhya Pradesh. (Aug. 2020 - Mar. 2022).

Principal Investigator. *Life-history constraints in grassland plant species of the Eastern Terai in India: Are trade-offs associated with competition, growth, and defense important for community structure.* **Rs. 35,60,577.** Funded by: Science and Engineering Research Board (SERB), Government of India (Feb. 2019 – Feb. 2022).

Principal Investigator. *Population and species survival assessment of red panda (*Ailurus fulgens*) in Singalila National Park, West Bengal: potential trajectory following re-stocking of the population under the captive breeding programme.* **Rs. 21,96,000.** Funded by: West Bengal Zoo Authority. Government of West Bengal. (Oct. 2018 – Oct. 2019)

Principal Investigator. *Fine scale assessment of tiger (*Panthera tigris*) connectivity networks in Panna Landscape, Madhya Pradesh.* **Rs. 11,13,000.** Funded by: Madhya Pradesh State Biodiversity Board. Government of Madhya Pradesh. (Jan. 2018 – Jul. 2018).

Principal Investigator. *Understanding the degradation and loss of primary forest in the Teesta valley of the Sikkim Himalaya: A framework for recovery and management of biodiversity and bioresources.* **Rs. 23,11,200.** Funded by: National Mission of Himalayan Studies, Ministry of Environment & Forests and Climate Change, Government of India. (Apr. 2016 - Mar. 2019).

Co-investigator & Mentor. *Landscape genetics of *Panthera tigris* in northeastern India.* DST-SERB National Post-doctoral Fellowship awarded to Dr. Mriganka Shekhar Sarkar. **Rs.19,20,000.** (2018 – 2020).

Co-investigator & Mentor. *Ecological restoration of mined-out areas in eastern Indian coal fields.* DST-SERB National Post-doctoral Fellowship awarded to Dr. Shruti Mishra. **Rs.19,20,000.** (2017-2019).

Visiting Scientist. *Eminent Foreign Teachers Program,* Hainan University, Haikou, P. R. China (Jul. 2018 – Jul. 2019)

Visiting Scientist Fellowship, Chinese Academy of Sciences. Hosted at the *South China Institute of Botany*, Guangzhou, P.R. China. **RMB 147,000.** (2014 - 2016).

Principal Investigator. *Recovery of the Tiger *Panthera tigris* and its prey in Manas National Park, Assam, India.* **US\$58,610.** Funded by: United States Fish and Wildlife Service. Rhino and Tiger Conservation Program, USA. (Apr. 2012 - Oct. 2014).

Co-Investigator. Institutional project between ATREE, Bangalore and the Norwegian University of Life Sciences on global climate change and biodiversity and agriculture. Total project outlay **Rs. 1,54,92,915/- (~ US\$ 300,000/-)** over a 3-year period. (Jun. 2007 – Jun. 2009).

Principal Investigator. *Research and Monitoring component of the UNESCO World Heritage Biodiversity Project sites in Assam, India.* **US\$120,000.** Funded by UNESCO. (2008- 2011).

Principal Investigator. *Science and Education on the linkages between climate change and biodiversity.* Funded by: HSBC Bank and Coordinated by Earthwatch UK. **£10,000.** (2009-2010).

Lead Principal Investigator and Coordinator. *Programme Support for Technological Innovations and Ecological Research for the Sustainable Use of Bioresources in the Sikkim Himalaya.* Funded by: Dept. of Biotechnology, Government of India. **Rs. 4,49,89,000/- (US\$890,000/-)** (2009 – 2016)

Professional Excellence Summary

Research Proficiency: Plant community ecology, population biology of plants and large mammals, biodiversity and ecosystem service assessments, plant ecophysiology, climate change and vegetation, plant-soil interactions, landscape ecology, conservation genetics.

Technical Proficiency: Advanced knowledge of statistical analyses and inference (Bayesian, Likelihood, Frequentist), experimental design, spatial statistics, geostatistics, GLM, research methodology; Geographical Information Systems (GIS) and Remote Sensing (RS); advanced computer programming in **R** and **FORTRAN 77** in the **Unix/Linux** environment.

Teaching Proficiency: Design and teach undergraduate and graduate-level courses in multiple areas of Ecology, Plant Ecophysiology, Probability and Statistics for Biologists, Environmental Science, Research Methods, Climate Change Biology, Sustainability Science, and Scientific Writing.

Student Mentoring

Post-doctoral Fellows	Current: 0	Past: 2
Ph.D. Students	Current: 3	Graduated: 6
M.S. Research Students	Current: 0	Graduated: 13

Research Areas, Impacts, and Potential

Tropical Forest Ecology: A deeper understanding of the role of multiple ecological processes that determine tree diversity in species-rich forests. These processes include negative density-dependent effects of seed predators and pathogens, resource competition for soil nutrients, habitat heterogeneity, dispersal limitation, and stochasticity. Quantifying the importance of these processes remains an important area of research in ecology. Our results are published in *PNAS-USA*, *Proc. Roy. Soc. Ser B London*, *Ecology Letters*, *J. of Ecology*, *Functional Ecology*, *Oecologia*, *J. of Vegetation Science*, *Scientific Reports*, *Plant Soil* and chapters in publishing houses of Cambridge, Chicago, and Blackwell have contributed to this important effort.

Grassland Ecology: Grasslands are among the most threatened ecosystems. We have focused on Terai grasslands, which are among the most biodiverse but also the most threatened. We have documented decadal-scale changes in grassland and grassland-woodland dynamics in the protected areas of the Terai, and have analysed the drivers of these changes. Our work has shed light on the importance of habitat factors, competition, facilitation, fire, climate, dispersal, plant invasions, and stochasticity for the diversity and structure of grassland ecosystems. Results are published in *Forest Ecology and Management*, *Agricultural and Forest Meteorology*, *Environmental Monitoring and Assessment*, *Environmental Conservation* and *Annals of Botany* and *Plant Ecology*. Our research in alpine meadows in Tibet/China on trait-based analyses of community assembly during succession has been published in multiple journals, including *Ecography*.

Wildlife and Habitat Management: Our studies on the recovery of the tiger and other carnivores, the large herbivore populations, and the vegetation of Manas National Park have informed management options for Manas National Park and the Assam Forest Department. We have analysed fire history and vegetation dynamics and mapped invasive species for this important protected wildlife habitat. In central India, we studied habitat connectivity and dispersal in the Panna landscape (area 89,000 km²) for tiger and ungulate species, which are adopted for management by the Madhya Pradesh State Government. Our study helped to designate tiger dispersal corridors and manage human-carnivore conflicts. Results published as a book (ISBN: 978-81-941948-1-1) and in *ISPRS International Journal of Geoinformation* and *European Journal of Wildlife Research*. We also worked on habitat and species diversity management of sacred forest sites in the state of Odisha, where we examined the potential of sacred sites to contribute to biodiversity conservation. Results published in *Environmental Conservation*.

Ecosystems and Environmental Change: Climate change and land-cover change pose the greatest threat to tropical ecosystems, particularly in montane regions. We performed a global-scale analysis of climate change impacts on montane vegetation and found that the 'greenness' of vegetation in species-rich tropical montane systems is decreasing due to climate warming-induced drought stress. Further, the fundamental nature of the climate-vegetation relationship may be undergoing reversal due to an interactive influence of temperature and drought stress. Moving on, we studied degradation

and deforestation of subtropical broadleaf forest in recent decades in the Teesta River basin of the Eastern Himalaya. This has drawn attention to forest conservation issues in Sikkim, India. A very detailed investigation on woodland-grassland dynamics of the eastern Terai is shedding light on how to manage plant diversity and wildlife habitat in this region, where there is immense pressure from human activities. Results published in *Global Change Biology*, *Applied Geography*, and *Forest Ecology and Management*. In parallel, we are investigating the patterns of alpha (local richness) and beta (species and functional trait turnover across space) in Indian montane forests to understand what governs these patterns and how this knowledge can be used for conservation. I am currently undertaking a large-scale assessment of diversity and ecosystem services in central India. This will contribute to a National Mission on Climate Change, in which large-scale afforestation efforts are underway.