

SANTOSH K. SHAH

SCIENTIST 'E'

Birbal Sahni Institute of Palaeosciences (BSIP),
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EDUCATION:

- 2007 Ph.D. in Botany**
Birbal Sahni Institute of Palaeobotany, Lucknow, India and Department of Botany,
University of Lucknow, Lucknow, India
Thesis Advisor: Dr. Amalava Bhattacharyya, BSIP, Lucknow, India
Thesis Title: Analysis of climatic changes in Northeast Himalaya and its comparison with
Western Himalaya during Late Quaternary
- 2001 M.Sc. in Botany**
University of North Bengal, Darjeeling, West Bengal, India
- 1998 B.Sc. in Botany (Honours), Zoology and Chemistry**
Kalimpong College, Kalimpong, West Bengal, India
- 2009 Professional course in Geology (April–July)**
BSIP, Lucknow in collaboration with Palaeontological Society of India, Lucknow
- 2008 Diploma in French**
University of Lucknow, Lucknow, India
- 2007 Proficiency in French**
University of Lucknow, Lucknow, India
- 1999 Diploma in Computer Education**
Aptech Computer Education, Kalimpong, West Bengal, India
- 1999 Diploma in Environment Management and ISO 14000/14001**
National Institute of Labour and Management (NILEM) Adyar, Chennai, India

APPOINTMENTS:

- 01/01/2021 – Scientist 'E',**
Till date Birbal Sahni Institute of Palaeosciences, Lucknow, India
- 01/01/2017 – Scientist 'D',**
31/12/2020 Birbal Sahni Institute of Palaeosciences, Lucknow, India
- 01/01/2013 – Scientist 'C',**
31/12/2016 Birbal Sahni Institute of Palaeosciences, Lucknow, India
- 15/09/2008 – Scientist 'B',**
31/12/2012 Birbal Sahni Institute of Palaeobotany, Lucknow, India
- 29/03/2007 – Birbal Sahni Research Associate,**
14/09/2008 Birbal Sahni Institute of Palaeobotany, Lucknow, India

22/08/2003 – 28/03/2007	Senior Research Fellow, Birbal Sahni Institute of Palaeobotany, Lucknow, India
01/01/2003 – 30/06/2003	Junior Research Fellow, Birbal Sahni Institute of Palaeobotany, Lucknow, India
21/05/2002 – 31/12/2002	Junior Research Fellow, Birbal Sahni Institute of Palaeobotany, Lucknow, India
01/09/2001 – 28/02/2002	Project Assistant, University of North Bengal, Darjeeling, India

RESEARCH INTEREST:

- **Dendrochronology**
- **Dendroclimatology:** Past temperature-, precipitation-, drought-, and Streamflow reconstruction
- **Dendrohydrology:** Streamflow reconstruction
- **Dendroecology:** Forest productivity and forest ecology
- **Climate Field Reconstruction**
- **Palynology:** Holocene Palynology and Modern Pollen-Climate calibration
- **Climate analysis:** Instrumental climate and streamflow data analysis

HONOURS, AWARDS AND RECOGNITIONS:

2025	Vice-President, Breakthrough Science Society (Uttar Pradesh Chapter) Coordinator Member, PAGES 2k Hydroclimate Network Phase 5 – (2025-2027)
2019	President, Asian Dendrochronological Association – (2019-2021) Treasurer, Association of Quaternary Researchers (AOQR) – (2019-2027) Governing body Member, Association of Quaternary Researchers (AOQR) Founder Member, Association of Quaternary Researchers (AOQR) INSA Bilateral Exchange Fellowship: Visited Tree-ring and Environmental Change Group, Xishuangbanna Tropical Botanical Garden (XTBG), CAS, P.R. China; July-August, 2019 (1 month).
2018	Visiting Scientist: Tree-ring and Environmental Change Group, Xishuangbanna Tropical Botanical Garden (XTBG), CAS, P.R. China; Jan.-Feb. 2018 (15 days).
2016	Diamond Jubilee Medal: for publishing papers of high quality in refereed journals during the two years preceding the year of the award.
2014	Fellow, East Himalayan Society for Spermatophyte Taxonomy Sharda Chandra Memorial Gold Medal: jointly with co-authors of paper entitled “ <i>Analysis of vegetation and climate change during Late Pleistocene from Ziro Valley, Arunachal Pradesh, Eastern Himalaya Region</i> ” published in Quaternary Science Reviews 101, 111-123, 2014 Paper of the Month Award: for August-September, 2014 at BSIP, Lucknow: For paper entitled “ <i>Analysis of vegetation and climate change during Late Pleistocene from Ziro Valley, Arunachal Pradesh, Eastern Himalaya Region</i> ” published in Quaternary Science Reviews 101, 111-123, 2014 (co-author) Paper of the Month Award: for December, 2014 at BSIP, Lucknow: For paper entitled “Spring temperatures in the far-western Nepal Himalaya since A.D. 1640 reconstructed

from *Picea smithiana* tree-ring widths" published in *Climate Dynamics* 45, 2069-2081, 2015
(correspondence author)

- 2008 **B.S.Venkatachala Memorial Gold Medal:** for the best research work done among the Young Scientists of the Birbal Sahni Institute of Palaeobotany, Lucknow, India.
- 2006 **Young Scientist Award and Second-Best Presentation:** by Department of Science and Technology for the research contribution on Palaeoclimate studies (16th December, 2006).
Department of Geology, University of Jammu, Jammu, India

IN-HOUSE PROJECTS AT BSIP, LUCKNOW:

- April, 2025–
March, 2029** Project: *Holocene Vegetation Reconstruction, Climate Change, Extreme Events and Anthropogenic impact in the Himalayan Region*
Status: Ongoing
- Project: *Quaternary Monsoon/Climate Reconstruction through high-resolution multi-proxy studies of lacustrine archives along the East-West Corridor in India (Project Acronym: QLDP-Phase 2)*
Status: Ongoing
- April, 2021–
March, 2025** Project: *Late Pleistocene–Holocene vegetation and climate reconstructions for the Himalayan region: understanding the dynamics and forcing mechanisms*
Working as a core team member
Status: Completed
- Project: *Quaternary Monsoon/ Climate reconstruction through high resolution multi - proxy studies of Lacustrine archives from central India (Core Monsoon Zone and Indo-Gangetic Plain)*
Working as an associate member
Status: Completed
- April, 2019–
March, 2021** Project: *Tree-ring based climate reconstruction of the Eastern Himalaya: A spatio-temporal perspective of multi-decadal variability*
Status: Completed
- April, 2017–
March, 2019** Project: *Spatio-temporal reconstruction of temperature and hydroclimatic variability in eastern and western Himalaya based on tree-rings*
Status: Completed
- April, 2012–
March, 2017** Project: *Tree-ring analysis from high altitude areas of Himalayan region: A comparative approach with emphasis on the eastern sector (Project number: 10.2 under XII Five Year Plan (2012-2017))*
Status: Completed
- April, 2007–
March, 2012** Project: *Analysis of climatic changes based on multi proxy data during Holocene from peninsular and Himalayan region (Project number: 10.2 under XI Five Year Plan (2007-2012))*
Status: Completed

EXTRAMURAL / SPONSORED PROJECTS:

- Co-Principal Investigator** Project: *Response of forest ecosystem to climate change in the Karnali region of Nepal Himalaya*
Sponsor: Tribhuvan University, Kirtipur, Nepal.
Principal Investigator: Narayan Prasad Gaire, Patan Multiple Campus, Tribhuvan University, Lalitpur, Nepal.
Status of the project: Ongoing
- Principal Investigator** Project: *Past climate change and tree line dynamics based on tree-ring data from the Himalayan region*
Sponsor: SERB Division, DST, New Delhi
Status of the project: Completed

Member	Project: <i>Tree line shift in central Nepal Himalaya and climate reconstruction of past millennia</i> Sponsor: Nepal Academy of Science and Technology, Nepal. Principal Investigator: Tree-ring society of Nepal; Status of the project: Completed
Co-Principal Investigator	Project: <i>Analysis of Climatic changes since LGM from South-West continental margin India using multi-proxy data: Pollen, Diatom and Tree-ring data</i> Sponsor: ISRO-GBP, India. Principal Investigator: Dr. Amalava Bhattacharyya, BSIP, Lucknow, India Status of the project: Completed

PARTICIPATION IN OTHER PROJECTS:

22/08/2003 – 28/03/2007	Worked as: Senior Research Fellow (SRF) Project/ Principal Investigator: <i>Analysis of climatic changes in North-east India during last several thousand years using pollen and tree-ring data</i> / A. Bhattacharyya, BSIP, Lucknow Sponsor: Department of Science and Technology, New Delhi
01/01/2003 – 30/06/2003	Worked as: Junior Research Fellow (JRF) Project/ Principal Investigator: <i>Analysis of climatic changes vis-à-vis glacial fluctuations using pollen and tree-ring data in Gangotri glacier area, Garhwal Himalaya</i> / A. Bhattacharyya, BSIP, Lucknow Sponsor: Department of Science and Technology, New Delhi
21/05/2002 – 31/12/2002	Worked as: Junior Research Fellow (JRF) Project/ Principal Investigator: <i>Analysis of climatic changes in eastern Himalayan region using tree-ring data</i> / A. Bhattacharyya, BSIP, Lucknow Sponsor: Department of Science and Technology, New Delhi

PUBLICATIONS:

Publication's summary:

Total Publication **83** [Journal Articles, Reviews and Book chapters **78**; Scientific report **5**]

Journal Articles, Reviews and Book Chapters

- 2025 [78] Mehrotra N, **Shah SK**. 2025. Regional climate and vegetation interactions in the high-altitude forests of North Sikkim, eastern Himalaya: A palynological approach. *Journal of the Palaeontological Society of India*. (**Accepted**)
- [77] Kholdaenko YA, Belokopytova L, Zhirnova DF, **Shah SK**, Mehrotra N, Babushkina EA, Vaganov EA. 2025. Wood anatomical structure of *Picea obovata* in plantation stands of different planting densities. *Dendrochronologia* 94: 126396. <https://doi.org/10.1016/j.dendro.2025.126396>
- [76] Islam N, Vennemann T, Büntgen U, Krusic PJ, **Shah SK**, Lane SN. Tree-ring based May-June streamflow reconstruction of Zemu River in the Eastern Himalaya. *Journal of Hydrology-Regional studies* 60: 102508. <https://doi.org/10.1016/j.ejrh.2025.102508>
- [75] **Shah SK**. 2025. Assessing climate-growth relationship with monthly and daily climate: A study on tree-rings of *Abies densa* Griff. from North Sikkim, Eastern Himalaya. *Pleione* 19(1): 121-131. <https://doi.org/10.26679/Pleione.19.1.2025.121-131>
- [74] Mehrotra N, **Shah SK**, Malsawmliana, Kar R. 2025. Modern pollen distribution across Mizoram, northeastern India, impacted by regional climate and anthropogenic activities. *The Holocene* 35(4): 434-445. <https://doi.org/10.1177/09596836241307299>
- [73] Husna A, **Shah SK**, Mehrotra N, Thomte L, Deeksha, Rahman TW, Pandey U, Islam N, Gaire NP, Singh D. 2025. Streamflow reconstruction using multi-taxa tree-ring records from Kullu

- Valley, Himachal Pradesh, western Himalaya. *Quaternary* 8(1): 1-22.
<https://doi.org/10.3390/quat8010009>
- 2024 [72] Gaire NP, Dhakal YR, **Shah SK**, Fan ZX. 2024. Potential of tree-ring chronologies for multi-centennial streamflow reconstructions: an insight from Nepal. *Proceedings of IAHS* 387: 33-39.
<https://doi.org/10.5194/piahs-387-33-2024>
- [71] Belokopytova LV, Zhirnova DF, Mehrotra N, **Shah SK**, Babushkina EA, Veganov EA. 2024. Improving the equation of nonlinear relationships between cell anatomical parameters of conifer wood. *Trees* 38: 1593-1599. <https://doi.org/10.1007/s00468-024-02559-w>
- [70] Tshering C, Thomte L, Dukpa D, **Shah SK**. 2024. Increasing growth sensitivity of *Pinus wallichiana* to summer season maximum temperature – Evidence from central Bhutan Himalaya. *Dendrobiology* 91: 125-136. <https://doi.org/10.12657/denbio.091.010>
- [69] Mehrotra N, **Shah SK**, Kar R. 2024. Palynology: a tool to decipher the impact of anthropogenic activity on palaeo-vegetation - a review based on fossil pollen records from India. In Samanta B, Thakre D. (Eds): *Application of Palynology in Stratigraphy and climate studies*. Springer. Gewerbestrasse, Switzerland. https://doi.org/10.1007/978-3-031-51877-5_8
- [68] Singh AK, **Shah SK**, Pandey U, Deeksha, Thomte L, Rahman TW, Mehrotra N, Singh DS, Kotlia BS. 2024. Vegetation Index (NDVI) reconstruction from western Himalaya through dendrochronological analysis of *Cedrus deodara*. *Theoretical and Applied Climatology* 115: 1713-1723. <https://doi.org/10.1007/s00704-023-04718-4>
- [67] Babushkina EA, Zhirnova DF, Belokopytova LV, Mehrotra N, Dergunov DR, **Shah SK**, Veganov EA. 2024. Conifer quantitative wood anatomy as proxy data: application in agricultural yield reconstruction. *Trees* 38: 573-589. <https://doi.org/10.1007/s00468-023-02437-x>
- 2023 [66] Pandey U, Nakatsuka T, Mehrotra N, Zhen L, Kato Y, Sano M, **Shah SK**. 2023. Tree-rings stable isotope ($\delta^{18}\text{O}$ and $\delta^2\text{H}$) based 368 years long term precipitation reconstruction of South Eastern Kashmir Himalaya. *Science of the Total Environment* 892: 164640.
<https://doi.org/10.1016/j.scitotenv.2023.164640>
- [65] Mehrotra N, Basavaiah N, **Shah SK**. 2023. Revisit the Medieval Warm Period and Little Ice Age in Proxy Records from Zemu Glacier Sediments, Eastern Himalaya: Vegetation and Climate Reconstruction. *Quaternary* 6(2): 32 <https://doi.org/10.3390/quat6020032>
- [64] Gaire NP, **Shah SK**, Sharma B, Mehrotra N, Thapa UK, Zan ZX, Aryal PC, Bhuju DR. 2023. Spatial minimum temperature reconstruction over the last three centuries for eastern Nepal Himalaya based on tree rings of *Larix griffithiana*. *Theoretical and Applied Climatology* 152: 895-910. <https://doi.org/10.1007/s00704-023-04432-1>
- [63] **Shah SK**, Berkelhammer M, Li Q, Mehrotra N, Thomte L, Shell R, Pandey U, Gaire NP, Kathayat G, Sinha A. 2023. Regional tree-ring oxygen isotope deduced summer monsoon drought variability for Kumaun-Gharwal Himalaya. *Quaternary Science Reviews* 301: 107927.
<https://doi.org/10.1016/j.quascirev.2022.107927>
- [62] Thomte L, **Shah SK**, Mehrotra N, Saikia A, Bhagabati AK. 2023. Dendrochronology in the tropics using tree-rings of *Pinus kesiya*. *Dendrochronologia* 78: 126070.
<https://doi.org/10.1016/j.dendro.2023.126070>
- [61] Gaire NP, Fan ZX, Chhetri PK, **Shah SK**, Bhuju DR, Wang J, Sharma B, Peilli S, Dhakal YR. 2023. Treeline Dynamics in Nepal Himalaya in a Response to Complexity of Factors. In Singh SP, Reshi ZA, Joshi, R (Eds): *Ecology of Himalayan Treeline Ecotone*, Springer, Singapore.
https://doi.org/10.1007/978-981-19-4476-5_22
- [60] Pandey U, **Shah SK**, Mehrotra N. 2023. Fluctuations of Kolahoi glacier, Kashmir valley, its assessment with tree-rings of *Pinus wallichiana* and comparable satellite imageries and field survey records. In Pandey M, Pandey PC, Ray Y, Arora A, Jawak SD, Shukla UK (Eds):

- [59] Deeksha, Mehrotra N, Thomte L, **Shah SK**. 2023. Seasonal and annual rainfall trends in Chhattisgarh, Central India – A study towards understanding hydroclimatic scenario for environmental assessment. In Jain R. (Ed): *Global Environmental Challenges Management & Sustainable Development*. Pratusth Publisher, New Delhi.
- 2022 [58] Mehrotra N, **Shah SK**, Basavaiah N, Kar R. 2022. Middle to Late Holocene climate, vegetation and sea-level changes in NW Tripura, northeast India, based on palynological and mineral magnetic evidence. *Journal of Paleolimnology* 68: 297-313. <https://doi.org/10.1007/s10933-022-00249-6>
- [57] Gaire NP, Zaw Z, Fan ZX, Bräuning A, Sharma B, Dhakal YR, Timilsena R, **Shah SK**, Bhuj DR. 2022. Increasing extreme events in the central Himalaya revealed from a tree-ring based multi-century streamflow reconstruction of Karnali River Basin. *Journal of Hydrology* 610: 127801. <https://doi.org/10.1016/j.jhydrol.2022.127801>
- [56] Thomte L, Bhagabati AK, **Shah SK**. 2022. Soil moisture-based winter-spring drought variability over West Karbi Anglong region, Assam, Northeast India using tree-rings of *Pinus kesiya*. *Environmental Challenges* 7: 100512. <https://doi.org/10.1016/j.envc.2022.100512>
- [55] Thomte L, **Shah SK**, Mehrotra N, Bhagabati AK, Saikia A. 2022. Influence of climate on multiple tree-ring parameters of *Pinus kesiya* from Manipur, Northeast India. *Dendrochronologia* 71: 125906. <https://doi.org/10.1016/j.dendro.2021.125906>
- [54] **Shah SK**, Mehrotra N, Gaire NP, Thomte L, Sharma B, Pandey U, Katel O. 2022. Potential utility of Himalayan tree-ring $\delta^{18}\text{O}$ to reveal spatial patterns of past drought variability – It's assessments and implications. In Kumaran KPN, Padmalal D (Eds): *Holocene Climate Change and Environment*, Elsevier. 265-292. <https://doi.org/10.1016/B978-0-323-90085-0.00003-6>
- [53] Demina AV, Belokopytova LV, Zhirnova DF, Mehrotra N, **Shah SK**, Babushkina EA, Vaganov EA. 2022. Degree of connectivity in reconstructed precipitation dynamics and extremes for semiarid regions across South Siberia. *Dendrochronologia* 71. 125903. <https://doi.org/10.1016/j.dendro.2021.125903>
- 2021 [52] Upadhyay KK, **Shah SK**, Roy A, Tripathi SK. 2021. Dendroclimatology of teak indicates prevailing climatic conditions of tropical moist forests in India. *Ecological Indicators* 129: 107888. <https://doi.org/10.1016/j.ecolind.2021.107888>
- [51] Babushkina EA, Zhirnova DF, Belokopytova LV, Mehrotra N, **Shah SK**, Keler VV, Vaganov EA. 2021. Prospects of Using Tree-Ring Earlywood and Latewood Width for Reconstruction of Crops Yield on Example of South Siberia. *Forests* 12: 174. <https://doi.org/10.3390/f12020174>
- 2020 [50] Thomte L, **Shah SK**, Mehrotra N, Bhagabati AK, Saikia A. 2020. Response between tree-rings of *Pinus kesiya* and daily climate – A study from Manipur, Northeast India. *The Palaeobotanist* 69: 27-34. <https://doi.org/10.54991/jop.2020.28>
- [49] Gaire NP, Fan ZX, **Shah SK**, Thapa UK, Rokaya MB. 2020. Tree-ring record of winter temperature from Humla, Karnali in central Himalaya: A 229 years-long perspective for recent warming trend. *Geografiska Annaler: Series A, Physical Geography* 102(3): 297-316. <https://doi.org/10.1080/04353676.2020.1751446>
- 2019 [48] **Shah SK**, Pandey U, Mehrotra N, Wiles GC, Chandra R. 2019. A winter temperature reconstruction for the Lidder Valley, Kashmir, Northwest Himalaya based on tree-rings of *Pinus wallichiana*. *Climate Dynamics* 53: 4059-4075. <https://doi.org/10.1007/s00382-019-04773-6>
- [47] Speer JH, **Shah SK**, Truettner C, Pacheco A, Bekker MF, Dukpa D, Cook ER, Tenzin K. 2019. Past Flood and River Flow Variability from Extreme Events Recorded in Trees Rings on the

- Dhur River, Bhutan. *Dendrochronologia* 56: 125606.
<https://doi.org/10.1016/j.dendro.2019.125605>
- [46] Upadhyay KK, **Shah SK**, Roy A, Mehrotra N, Tripathi SK. 2019. Dendrochronological potential of *Tectona grandis*, *Pinus kesiya* and *Quercus serrata* from Mizoram, Northeast India. *Indian Journal of Ecology* 46(4): 722-728
- [45] Bhandari S, Gaire NP, **Shah SK**, Speer JH, Bhuju DR, Thapa UK. 2019. A 307-year tree-ring SPEI reconstruction indicates modern drought in western Nepal Himalayas. *Tree-ring Research* 75(2): 73-85. <https://doi.org/10.3959/1536-1098-75.2.73>
- [44] **Shah SK**, Singh R, Mehrotra N, Thomte L. 2019. River flow reconstruction of the Lohit River Basin, North-east India based on tree-rings of *Pinus merkusii* (Merkus pine). *The Palaeobotanist* 68: 113-124. <https://doi.org/10.54991/jop.2019.38>
- [43] Gaire NP, Dhakal YR, **Shah SK**, Fan ZX, Bräuning A, Thapa UK, Bhandari S, Aryal S, Bhuju DR. 2019. Drought (scPDSI) reconstruction of trans-Himalayan region in western Nepal using *Pinus wallichiana* tree-rings. *Palaeogeography, Palaeoclimatology, Palaeoecology* 514: 251-264. <https://doi.org/10.1016/j.palaeo.2018.10.026>
- [42] Mehrotra N, **Shah SK**. 2019, Basavaiah N, Laskar AH, Yadava MG. Resonance of the '4.2ka event' and terminations of global civilizations during the Holocene, in the palaeoclimate records around PT Tso Lake, Eastern Himalaya. *Quaternary International* 507: 206-216. <https://doi.org/10.1016/j.quaint.2018.09.027>
- 2018 [41] **Shah SK**, Pandey U, Mehrotra N. 2018. Precipitation reconstruction for the Lidder Valley, Kashmir Himalaya using tree-rings of *Cedrus deodara*. *International Journal of Climatology* 38: 758-773. <https://doi.org/10.1002/joc.5405>
- [40] Babushkina EA, Belokopytova LV, Zhirnova DF, **Shah SK**, Kostyakova TV. 2018. Climatically driven yield variability of major crops in Khakassia (South Siberia). *International Journal of Biometeorology* 62: 939-948. <https://doi.org/10.1007/s00484-017-1496-9>
- [39] Babushkina EA, Belokopytova LV, **Shah SK**, Zhirnova DF. 2018. Past crops yield dynamics reconstruction from tree-ring chronologies in the forest-steppe zone based on low-and high-frequency components. *International Journal of Biometeorology* 62: 861-871. <https://doi.org/10.1007/s00484-017-1488-9>
- [38] Mehrotra N, **Shah SK**. 2018. A preliminary study of the modern pollen of Tripura, Northeast India. *The Palaeobotanist* 67: 21-31. <https://doi.org/10.54991/jop.2018.45>
- [37] Pandey U, **Shah SK**, Mehrotra N. 2016. Tree-ring studies from Kashmir valley: Present status and future perspectives. *Geophytology* 46(2): 207-220.
- 2017 [36] **Shah SK**, Mehrotra N. 2017. Tree-ring studies of *Toona ciliata* from subtropical wet hill forests of Kalimpong, eastern Himalaya. *Dendrochronologia* 46: 46-55. <https://doi.org/10.1016/j.dendro.2017.10.001>
- [35] Gaire NP, Bhuju DR, Koirala M, **Shah SK**, Carrer M, Timilsena R. 2017. Tree-ring based spring precipitation reconstruction in western Nepal Himalaya since AD 1840. *Dendrochronologia* 42: 21-30. <https://doi.org/10.1016/j.dendro.2016.12.004>
- [34] **Shah SK**, Pandey U, Mehrotra N, Chandra R. 2017. Tree-ring analysis of *Cedrus deodara* in Pahalgam, Kashmir valley, India: influence of climate and regional linkages. *Himalayan Research Journal* II(III): 1-8.
- [33] Mehrotra N, **Shah SK**, 2017. The Late Quaternary sediments from Tripura, North-east India: perspective on the constraints of their radiocarbon dating. *Geophytology* 47(2): 221-227.

- [32] Mehrotra RC, Mehrotra N, Srivastava G, **Shah SK**. 2017. Occurrence of fossil woods in the Unakoti district, Tripura and their palaeoclimatic significance. *Journal of the Palaeontological Society of India* 62(1): 17-30.
- 2016 [31] Dhakal YR, Gaire NP, Aryal S, **Shah SK**, Bhandari S, Kunwar U, Rayamajhi S. Treeline shift in central Nepal Himalaya and climate reconstruction of past millennia. 2016 In: Bhuju DR, McLaughlin K, Sijapati J, Devkota BD, Shrestha N, Ghimire GP, Neupane PK. (eds.), Building Knowledge for Climate Resilience in Nepal. Nepal Academy of Science and Technology, Lalitpur. Pp 41-44.
- 2015 [30] **Shah SK**, Touchan R, Babushkina E, Shishov VV, Meko DM, Abramenko OV, Belokopytova LV, Hordo M, Jevšenak J, Kędziora W, Kostyakova TV, Moskwa A, Oleksiak Z, Omurova G, Ovchinnikov S, Sadeghpour M, Saikia A, Sidenko T, Strantsov A, Tamkevičiūtė M, Tomusiak R, Tychkov I, Sewastynowicz Ł. 2015. August-July precipitation from tree rings in forest-steppe zone of central Siberia (Russia). *Tree-ring research* 71(1): 37-44.
<https://doi.org/10.3959/1536-1098-71.1.37>
- [29] Thapa UK, **Shah SK**, Gaire NP, Bhuju DR. 2015. Spring temperatures in the far-western Nepal Himalaya since A.D. 1640 reconstructed from *Picea smithiana* tree-ring widths. *Climate Dynamics* 45: 2069-2081. <https://doi.org/10.1007/s00382-014-2457-1>
- 2014 [28] Bhattacharyya A, Mehrotra N, **Shah SK**, Basavaiah N, Chaudhary V, Singh IB. 2014. Analysis of vegetation and climate change during Late Pleistocene from Ziro Valley, Arunachal Pradesh, Eastern Himalaya Region. *Quaternary Science Reviews* 101: 111-123.
<https://doi.org/10.1016/j.quascirev.2014.07.008>
- [27] **Shah SK**, Bhattacharyya A, Chaudhary V. 2014. Streamflow reconstruction of Eastern Himalaya River, Lachen 'Chhu', North Sikkim, based on tree-ring data of *Larix griffithiana* from Zemu Glacier basin. *Dendrochronologia* 32: 97-106.
<https://doi.org/10.1016/j.dendro.2014.01.005>
- [26] **Shah SK**, Shekhar M, Bhattacharyya A. 2014. Anomalous distribution of *Cedrus deodara* and *Pinus roxburghii* in Parbati valley, Kullu, Western Himalaya: An assessment in Dendrochronological perspective. *Quaternary International* 325: 205-212.
<https://doi.org/10.1016/j.quaint.2013.09.024>
- [25] Mehrotra N, **Shah SK**, Bhattacharyya A. 2014. Review of Palaeoclimate records from Northeast India based on Pollen proxy data of Late Pleistocene-Holocene. *Quaternary International* 325: 41-54. <https://doi.org/10.1016/j.quaint.2013.10.061>
- [24] **Shah SK**, Bhattacharyya A, Mehrotra N. 2014. Tree-ring studies from eastern Himalaya: Prospects and challenges. *Himalayan Research Journal* 2(1): 76-87.
- 2013 [23] **Shah SK**, Bhattacharyya A, Shekhar M. 2013. Reconstructing discharge of Beas river basin, Kullu valley, western Himalaya based on tree-ring data. *Quaternary International* 286: 138-147.
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Scientific reports

- 2025 [05] Peña K, Kirchhefer AJ, Edvardsson J, Pederson N, Islam M, Bhattacharjee K, Kabir CR, **Shah SK**, Rahman TW, Stahle DW, Groenendijk P, Khan A, Iqbal J, Peña R, Hadad MA, Rinn F. 2025. ECUADENDRO 2025: The 1st Ecuadorian Dendrochronology Conference (Meeting Report). *Tree-ring Research* 81(2): 91-95. <https://doi.org/10.3959/TRR2025-2>
- 2023 [04] Mehrotra N, **Shah SK**. 2023. Insight into the 4.2 ka event records in northeastern India: a global connection and the geological evidence. *PAGES Newsletter* 31(1): 28-29. <https://doi.org/10.22498/pages.31.1.28>
- 2020 [03] **Shah SK**, Kapur VV, Manoj MC, Srivastava J, Prasad V. 2020. Recent Advancement(s) at the Birbal Sahni Institute of Palaeosciences, Lucknow: An Overview. *Proceedings of Indian National Science Academy* 86(1). 675-688. <https://doi.org/10.16943/ptinsa/2020/49826>
- 2016 [02] Bhuju DR, **Shah SK**, Gaire NP. 2016. Environmental reconstruction and impact of climate change on vegetation at tree-lines of Nepal Himalaya. *Annual report of Pro Natura Foundation Japan* 24, pp 24
- 2014 [01] Mehrotra N, **Shah SK**. 2014. Review of Holocene palaeoclimate of Northeast India based on Pollen records. *Quaternary Geology and Climate Change Newsletter* 1(1), pp 15-16.

PUBLICATION IN HINDI:

- 2023 [01] पाण्डेय उत्तम, गाँधी नवीन, **शाह संतोष कुमार**, मेहरोत्रा निवेदिता. २०२३. जलवायु परिवर्तन अनुसन्धान में वृक्षों का योगदान। *इंद्रधनुष पत्रिका*, अंक २१, पृष्ठ १०-११.

RESEARCH SUPERVISIONS:

Ph.D. Thesis [Total: 7]

- | | | | | |
|--------------|------|--------------------|---|--|
| 2025-Ongoing | [07] | Title | : | - |
| | | Scholar | : | Rutvika Kiritbhai Kahar (Birbal Sahni Research Scholar) |
| | | Ph.D. Registration | : | In process |
| | | Supervisor | : | Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India |
| | | Co-Supervisor | : | - |
| 2024-Ongoing | [06] | Title | : | Assessing climate driven growth patterns in conifer species in Central-Western Himalaya: A Dendroecological Approach |
| | | Scholar | : | Khushboo Kashyap (UGC-JRF) |
| | | Ph.D. Registration | : | Jawaharlal Nehru University, New Delhi, India |

		<i>Supervisor</i>	: Prof. Satish Chandra Garkoti, School of Environment Sciences, JNU, New Delhi, India
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2023-Ongoing	[05]	<i>Title</i>	: <i>Response of forest to climate change in Karnali region of Nepal Himalaya and past climate reconstruction</i>
		<i>Scholar</i>	: Yub Raj Dhakal (TU Funded Project Research Scholar)
		<i>Ph.D. Registration</i>	: Tribhuvan University, Nepal
		<i>Supervisor</i>	: Prof. Narayan P. Gaire, Department of Environmental Science, Patan Multiple Campus, Tribhuvan University, Lalitpur, Nepal
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2022-Ongoing	[04]	<i>Title</i>	: <i>Evaluation of climatic indices and past climate reconstruction using tree-rings of Abies spp. from the Himalaya region</i>
		<i>Scholar</i>	: Tanveer W. Rahman (UGC-JRF)
		<i>Ph.D. Registration</i>	: Department of Geography, Gauhati University, Guwahati, Assam, India
		<i>Supervisor</i>	: Prof. Anup Saikia, Department of Geography, Gauhati University, Guwahati Assam, India
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2021-2025	[03]	<i>Title</i>	: <i>Hydroclimatic variability based on instrumental and proxy records of Chhattisgarh, Central India</i>
		<i>Scholar</i>	: Deeksha (DST-INSPIRE Fellow)
		<i>Ph.D. Registration</i>	: CAS in Geology, Lucknow University, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2018-2022	[02]	<i>Title</i>	: <i>Climate signals from multiple tree-ring parameter of Pinus kesiya from Northeast India</i>
		<i>Scholar</i>	: Lamginsang Thomte (UGC-JRF)
		<i>Ph.D. Registration</i>	: Department of Geography, Gauhati University, Guwahati, Assam, India
		<i>Supervisor</i>	: Prof. A K Bhagabati Department of Geography, Gauhati University, Guwahati Assam
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2014-2018	[01]	<i>Title</i>	: <i>Dendroclimatology of Liddar valley and adjoining areas in Kashmir Himalaya</i>
		<i>Scholar</i>	: Uttam Pandey (DST Funded Project JRF)
		<i>Ph.D. Registration</i>	: CAS in Geology, Lucknow University, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India

M.Sc. Dissertations [Total: 14]

2025	[14]	<i>Title</i>	: Aspects of climatic influences on multiple tree-ring parameters of <i>Tsuga dumosa</i> from Arunachal Pradesh, eastern Himalaya
		<i>Student</i>	: Anushka Verma
		<i>Affiliation</i>	: CAS in Geology, University of Lucknow, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2024	[13]	<i>Title</i>	: Tree-ring $\delta^{18}\text{O}$ of <i>Cedrus deodara</i> reflects vapor pressure variations and indicates atmospheric aridity in the Gharwal-Kumaun Himalaya since the 17th Century
		<i>Student</i>	: Shivani Gautam
		<i>Affiliation</i>	: Department of Chemistry, University of Lucknow, Lucknow, India
		<i>Supervisor</i>	: Dr. Shashi Pandey, Department of Chemistry, University of Lucknow, Lucknow, India
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[12]	<i>Title</i>	: Recent warming trend in tree-ring based August-September temperature reconstruction from North Sikkim, eastern Himalaya
		<i>Student</i>	: Basunandan Handique
		<i>Affiliation</i>	: Department of Geology, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India
		<i>Supervisor</i>	: Dr. Ravindra Kumar, Department of Geology, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[11]	<i>Title</i>	: Tree-ring $\delta^{18}\text{O}$ based streamflow reconstructions in the Karnali River Basin, Nepal for 223-year (1778-2000 CE)
		<i>Student</i>	: Smriti Pandey
		<i>Affiliation</i>	: CAS in Geology, University of Lucknow, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[10]	<i>Title</i>	: Assessment of tree-ring $\delta^{18}\text{O}$ as a record of multi-century streamflow reconstruction in Punantsang Chhu Basin, Bhutan Himalaya
		<i>Student</i>	: Tanu Soni
		<i>Affiliation</i>	: CAS in Geology, University of Lucknow, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University

		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2023	[09]	<i>Title</i>	: <i>Multispecies tree-ring based streamflow reconstruction in Parvati valley, Western Himalaya, India</i>
		<i>Student</i>	: Asmaul Husna
		<i>Affiliation</i>	: Tropical Forestry, Dresden University of Technology, Germany / Department of Science, University of Copenhagen, Denmark
		<i>Supervisor</i>	: Dr. Ernst van der Maaten, Institute of Forest Growth and Forest Computer Sciences, Tharandt, Germany
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2020	[08]	<i>Title</i>	: <i>Snowfall reconstruction of Pahalgam, Lidder valley, Jammu and Kashmir based on tree-rings of Cedrus deodara</i>
		<i>Student</i>	: Deeksha
		<i>Affiliation</i>	: CAS in Geology, University of Lucknow, Lucknow, India
		<i>Supervisor</i>	: Prof. Munendra Singh, Department of Geology, CAS, Lucknow University
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[07]	<i>Title</i>	: <i>Snowfall data analysis of Jammu and Kashmir, India</i>
		<i>Student</i>	: Ayush Bharti
		<i>Affiliation</i>	: Department of Energy and Environment, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India
		<i>Supervisor</i>	: Ms. Priyanka Singh, Department of Geology, Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2019	[06]	<i>Title</i>	: <i>Tree-rings study of Pinus wallichiana from Chumey valley, Bumthang, Bhutan</i>
		<i>Student</i>	: Jambay Dema
		<i>Affiliation</i>	: College of Natural Resources, Royal University of Bhutan, Lobesa, Bhutan
		<i>Supervisor</i>	: Dr. Om Katel, College of Natural Resources, Royal University of Bhutan, Lobesa, Bhutan
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[05]	<i>Title</i>	: <i>Response of climate on radial growth of Pinus kesiya in East Khasi Hills of Meghalaya, India</i>
		<i>Student</i>	: Iaikitkupar Lyngdoh
		<i>Affiliation</i>	: College of Natural Resources, Royal University of Bhutan, Lobesa, Bhutan
		<i>Supervisor</i>	: Dr. Om Katel, College of Natural Resources, Royal University of Bhutan, Lobesa, Bhutan
		<i>Co-Supervisor</i>	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India

2017	[04]	Title	: <i>Tree-ring based streamflow reconstruction for the Lohit basin, Arunachal Pradesh, North-east India</i>
		Student	: Rohini Singh
		Affiliation	: School of Earth Sciences, Department of Geology, Banasthali University, Rajasthan, India
		Supervisor	: Mr. Amit K. Mishra, School of Earth Sciences, Department of Geology, Banasthali University, Rajasthan, India
		Co-Supervisor	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2013	[03]	Title	: <i>Climatic reconstruction of western Nepal Himalaya spanning over three centuries as inferred from ring-widths of <i>Picea smithiana</i> (Wall.) Boiss</i>
		Student	: Udy K. Thapa
		Affiliation	: Golden Gate Int'l College (affiliated to Tribhuvan University, Kathmandu, Nepal), Nepal
		Supervisor	: Dr. Dinesh Raj Bhuj, Nepal Academy of Science and Technology, Nepal
		Co-Supervisor	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
2009	[02]	Title	: <i>Forest ecology and tree-ring pattern at the treeline of Langtang National Park, Rasuwa, Nepal Himalaya</i>
		Student	: Yub Raj Dhakal
		Affiliation	: Central Department of Environmental Science, Tribhuvan University, Nepal
		Supervisor	: Dr. Dinesh Raj Bhuj, Nepal Academy of Science and Technology, Nepal
		Co-Supervisor	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India
	[01]	Title	: <i>Ecology and Dendroclimatology of Treeline Forest in Langtang National Park, Nepal Himalaya</i>
		Student	: Narayan Prasad Gaire
		Affiliation	: Central Department of Environmental Science, Tribhuvan University, Nepal
		Supervisor	: Dr. Dinesh Raj Bhuj, Nepal Academy of Science and Technology, Nepal
		Co-Supervisor	: Santosh K. Shah, Birbal Sahni Institute of Palaeosciences, Lucknow, India

SYNERGISTIC ACTIVITIES:

Resource Person / Training instructor

2022	[06]	Imparted training at BSIP, Lucknow on “Basic Dendrochronology and its application in climate reconstruction” to a Scientist and a Chief Technical Officer from Institute of Wood Science and Technology, Bangalore, India; September 12-16, 2022
2018	[05]	Instructor for “Training on Dendrochronology and its application” held at Resources Himalaya Foundation, Kathmandu, Nepal; organized by Tree-ring Society of Nepal; August 24-25, 2018
	[04]	Group Leader/ Instructor for field week of project <i>Dendroclimatology and Dendrohydrology</i> during 10 th World Dendro Conference; June 2-22, 2018

- 2017 [03] Training Workshop on “Tree ring analysis using Matlab and R” Tree-ring and Environmental Change Group, Xishuangbanna Tropical Botanical Garden (XTBG), Chinese Academy of Sciences, P.R. China; January 31, 2017
- 2014 [02] Training Workshop on “Reconstructing Climate Using Dendrochronological Tools” held at Resources Himalaya Foundation, Kathmandu, Nepal; organized by Tree-ring Society of Nepal; February 3-7, 2014
- [01] Training Workshop on “Concepts in Quaternary climate studies with emphasis on Dendrochronology and Palynology” held at Srinagar, Garhwal Himalaya, Uttaranchal; organized by BSIP, Lucknow, India; 2009

Editorial Services

- 2024 [01] Member, Topical Advisory Panel, Quaternary (MDPI Journal) – Since January, 2024
- 2023 [01] Associate Editor, Dendrochronologia (Elsevier Journal) – Since October, 2023

Organizer

- 2022 [04] Co-organizing Secretary, “The 7th Asian Dendro-Conference & the 7th Chinese Dendro-Conference, Land-sea Interaction and Environmental Issues”, April 20-24, 2022
- 2021 [03] Training coordinator, for National virtual training programme “Quaternary Palynology – Lets explore the fascinating world of pollen & spores” organised Association of Quaternary Researchers in association with Birbal Sahni Institute of Palaeosciences, Lucknow; February 22-24, 2021.
- 2019 [02] Local Organizer, for virtual online conference on “Earth’s Changing climate”, Online conference organized by Society of Earth Scientist, October 15-17, 2020
- [01] Organizing Secretary of “AsianDendro 2019 - The 6th Asian Dendrochronology Conference” held at BSIP, Lucknow during November 24–30, 2019

Scientific Committee Member

- 2025 [01] Co-Convenor: Local Working Committee (LWC) for “XXII INQUA 2027 Congress, India”; January 28- February 3, 2027
- [02] Convenor: Science Program Committee (SPC) for “XXII INQUA 2027 Congress, India”; January 28- February 3, 2027
- [03] ECUADENDRO 2025: The 1st Ecuadorian Dendrochronology Conference “Unlocking the Secrets of Time from Tree Rings”; January 23-24, 2025
- 2018 [01] 10th World Dendro Conference; June 2-22, 2018
- 2015 [01] The fourth International Asian Dendrochronological Conference on climate change and tree rings, Kathmandu, Nepal; March 9-12, 2015

Organizing Committee Member

- 2017 [02] Brainstorming workshop on “Quaternary Environments and Climates: Focus on Holocene and Anthropocene” BSIP Lucknow, February 21–23, 2017
- 2014 [01] National conference on “Quaternary Climate Change: New approaches and emerging challenges” BSIP Lucknow, December 15–16, 2014

Session Chaired

- 2018 [03] For session Dendrohydrology during 10th World Dendro Conference; June 2–22, 2018

- 2014** [02] For session “High resolution Palaeoclimatic Change” *National Conference on Quaternary Climate Change: New Approaches and Emerging Challenges* held at BSIP, Lucknow; December 15–16, 2014
- 2011** [01] For session “Vegetation and land-cover calibration: Models & Methods” *IGBP PAGES PHAROS Workshop: Land-cover reconstructions in the monsoon affected tropical world-pollen modelling approach and data synthesis* held at French Institute of Pondicherry, Puducherry; January 27–29, 2011

External Examiner for PhD viva-voce

- 2018** [03] Department of Env. Science, Tribhuvan University, Kathmandu, Nepal; August, 2018
- 2016** [02] Institute of Forestry, Pokhara, Tribhuvan University, Nepal; November, 2016
- [01] Department of Environmental Science, Tribhuvan University, Kathmandu, Nepal; September, 2016

PROFESSIONAL MEMBERSHIPS:

- Breakthrough Science Society – *Annual Member*
- Association of Quaternary Researchers (AOQR) – *Life Member*
- Vijnana Bharati (VIBHA) – *Life Member*
- The Indian Science Congress Association – *Life Member*
- Asian Dendrochronology Association (ADA) – *Annual Member*
- East Himalayan Society of Spermatophyte Taxonomy – *Life Member and Fellow*
- The Palaeobotanical Society – *Life Member*
- Palaeontological Society of India – *Life Member*
- Tree-ring society of Nepal – *Life Member*

Updated | September 11, 2025

SHORT BIODATA

Dr. Santosh K. Shah is currently working as Scientist 'E' at the Birbal Sahni Institute of Palaeosciences, Lucknow. His primary research focus is Dendrochronology, the study of tree rings, which he applies to reconstruct and analyze past climate variability, extreme events such as droughts and floods, river flow, glacier history, and climate field reconstructions. His research spans across the Himalayas in India, Nepal, Bhutan, as well as parts of Russia. He also works extensively on palaeovegetation and quantitative past climate reconstruction using pollen data from the Himalayan region.

He has published 83 research papers in reputed national and international journals and book chapters. Dr. Shah has supervised three Ph.D. students and is currently guiding four more in Geography and Environmental Sciences, along with mentoring 14 master's dissertations. He has also served as a resource person and course instructor for dendrochronology training programs in India, Nepal, Bhutan, and China.

Dr. Shah's contributions have been widely recognized. He was the first recipient of the B.S. Venkatachala Memorial Gold Medal (2008), awarded the Young Scientist Award (2006) by DST, received the Diamond Jubilee Medal of BSIP (2016), and is a Fellow of the East Himalayan Society for Spermatophyte Taxonomy. In 2019, he received the prestigious INSA Bilateral Exchange Fellowship to conduct research in China.

He has also played an important leadership role in scientific communities—serving as the President of the Asian Dendrochronological Association (2019–2021), founder and governing body member of the Association of Quaternary Researchers (AOQR), and currently its Treasurer, Vice-President of Breakthrough Science Society (Uttar Pradesh Chapter). He has been selected as a coordinator of PAGES2k – Phase 5 from 2025 to 2027 to study global hydroclimate over the past 2000 years.

Updated | September 11, 2025