


Profile of Prof. Mahendra Pratap Singh Bisht

Name	Dr. Mahendra Pratap Singh Bisht	
Father's Name	Late Shri R. S. Bisht	
Present Position	Professor and Head Department of Geology	
Mailing Address	Head, Department of Geology, HNB Garhwal University Chauras Campus, P O - Kilkilleshwar Via Kirtinagar, UK - 249161	
Permanent Address	SURNIM Bhawan, Aniket Vihar Lane -3/1 Doon University Road, Dehradun UK -248001	
E-mail Id	mpbisht@gmail.com , website: www.hnbgu.sac.in	
Phone No.	9412971070 (Mob.)	
Field of Interest:		
Environmental Geology, Applied Geomorphology, Natural Resource Management, Remote Sensing and GIS Modelling, Geo-Spatial Data Analysis.		
Educational Background:		
<ul style="list-style-type: none"> • Ph. D. (Landslide Hazards-Applied Geomorphology), WIHG Dehradun /HNBGU Srinagar • M.Sc. (Geology), HNB Garhwal University, Srinagar (Garhwal) 		
Title of D.Phil. Thesis:		
Study of landforms around Pipalkoti and Helang (Garhwal Himalaya) with special reference to landslide and soil erosion”		
Employment Records:		
<ul style="list-style-type: none"> • Professor, Dept. of Geology, HNBSGU Srinagar (Garhwal) (2023-onward with GP 10,000/-) • Director, Uttarakhand Space Application Centre, Dehradun, (2018-16 /01/ 2023 with GP 10,000/-) • Professor, Dept. of Geology, HNBSGU Srinagar (Garhwal) (2010-04/01/2018 with GP 10,000/-) • Associate Professor, Dept. of Geology, HNBSGU Srinagar (Garhwal) (2003-2010) • Senior Lecturer, Dept. of Geology, HNBSGU Srinagar (Garhwal) (1998-2003) • Lecturer, Dept. of Geology, HNBSGU Srinagar (Garhwal) (1993-1998) • Research Scholar, NRDMS Group, Wadia Institute of Himalayan Geology D. Dun (1987-1993) • Research Scholar, Dept. of Geology, HNBSGU Srinagar (Garhwal) (1985-1987) 		

Membership/Association with Professional Bodies:

Life Membership	Annual Membership	
Indian Society of Earthquake Science	Indian Science Congress	
Indian Society of Remote Sensing	Indian Association of Sedimentologists	
Himalayan Geological Society	Association of Petroleum Geologists	
ENVIS; Wildlife Institute of India	Geological Society of India	
Indian Red Cross Society		

Member of Committees:

1. Member **Research Advisory Committee**, Pantnagar University, Rudrapur Uttarakhand
2. Member expert, “**Uttarakhand Disaster Recovery Program**”, Under the project implementation unit-resilient housing and buildings, funded by World Bank and Asian Development Bank to Government of Uttarakhand after 2013 tragedy of Uttarakhand.
3. Member, “**Study Group on Himalayan Glacier**”: Report of the Study Group on Himalayan Glaciers, submitted to the Principal Scientific Advisor, Government of India-2011.
4. Member, “**Biodiversity Monitoring Expeditions, Nanda Devi Biosphere Reserve**”, Uttarakhand Organised by Department of Forest, Uttarakhand and MOEF, Govt. of India.
5. Member, expert committee on “**Landslide Hazard Monitoring of Ukhimath Tragedy – a natural calamity in 1999**” formed by HNB Garhwal University on behalf of U. P. Government.
6. Member, Task Force of (1) Landslide Erosion and Mass Wasting in Mansa Devi Area, Haridwar - 1989, (2) Neelkanth Tragedy-1990 and (3) Geomorphic and Glacial Hazards in Badrinath Area-2003. Technical Reports Submitted to DST, MOEF, Government of India and Uttarakhand Forest Department.
7. Member, scientific group in the Documentary film of *National Geographic Corporation Ltd*, episode on “**Lake of Skeletons**”- a famous **Roopkund Tragedy** to the popular series “Riddles of the Dead”.
8. Member expert, **Water, Sanitation and Family Education in the Rural Areas of Garhwal Himalaya**. A community based developmental program sponsored by World Bank to SBMA, (NGO), Anjanisain, Tehri Garhwal, India, 1999.

Academic Interface:

Teaching Experience: 30 Years, (30th August, 1993 onward)

1. **Undergraduate**: Physical, Structural, Environmental Geology. (Including Practical exercises and field works)
2. **Postgraduate**: General geology, Geotectonic, Environmental geology, and Remote Sensing & GIS. (Including practical exercises and field excursions).
3. **Dissertation Work** in Remote Sensing and GIS (Specialisation: Geosciences), Applied Geomorphology and Environmental Geology; Since 2010.

Research Experience: 37 Years:

The research investigations were mainly focused on the various Geo-environmental issues like Landslides, Soil Erosion, Water and Glacial Hazards in the rugged mountainous terrain of Uttarakhand Himalaya and the Application of Remote Sensing and GIS techniques to fulfill the task. Some fundamental basic geological research also carried out in collaboration with ONGC in the Aravalli Hills, Assam-Arakan Basin and Satpura Basin of Indian Sub-continent.

Experience of Guiding Research:

- 1- **D. Phil. Students Produced: 12**
- 2- **D Phil. Students Registered: 01**
- 3- **R & D Projects Completed: 05**
- 4- **Application Projects Completed: 23**

R & D Projects: 05

1. **Study of some landslides along MCT zone in Mandakini valley and their relation with neotectonic activities.** Sponsored by Department of Science & Technology, Government of India. 1994 - 97 (Completed).
2. **Studies of Periglacial Landforms around Kedarnath area (Garhwal Himalaya) and its Environmental Significance,** sponsored by HNB Garhwal University, Srinagar (Garhwal), 1995 - 96 (Completed).
3. **Data Base for Land Resources and Strategy for their Management in the Nanda Devi Biosphere Reserve, Garhwal Himalaya.** Sponsored by Ministry of Environment and Forests, Government of India. November, 2001- December 2004 (Completed).
4. **Impact of Glacier Recession on the Vegetative cover of the Valley of Flowers, Uttaranchal Himalaya.** Sponsored by Ministry of Environment and Forests, Government of India. 2009 - 2012 (Completed).
5. **Natural Resource Management and GIS Application in the Bhyundar Ganga Catchment, Uttarakhand Himalaya.** Submitted to the Indian Institute of Remote Sensing Department of space Government of India, Dehradun. 2015.

Application Projects Completed: 23

1. **Nilkanth Tragedy, Geological and Geomorphological Approach.** (Besides the Landslide studies and other Mass-movement phenomena scientific inputs were also provided to the District Magistrate, Army personals and Police during the Natural calamity). A report submitted to Department of Science & Technology, Government of India. 1990.
2. **Kaindul Waterfall Multipurpose Project, Based on Micro-Hydel Scheme, (en effort to utilize existing natural resources).** Submitted to Department of Science & Technology, Government of India. 1990.
3. **Landslides, Erosion & Mass Wasting in Mansa Devi Area, Haridwar (A report on causative factors, remedial measures and monitoring of suggested engineering structures for landslide control).** Report submitted to the Director Rajaji National Park, Department of Forest, U. P., 1991.
4. **Dudh Ganga Micro-Hydel Project at Kedarnath, (based on harnessing natural gradient and potential flow of Dudh Ganga).** In this project site selection, plan, discharge measurement and power distribution system were the main task. This is one of the appreciable works, still in the service of nation, located at 3562mt over Dudh Ganga near Kedarnath shrine.
5. **Mausam, Jalwayu Aur Pariyavaran, Awo Isko Samjhain (Hindi).** It was an environmental awareness programme for the overall community development of the rural areas of Pauri, Chamoli and Tehri districts of Garhwal Himalaya, 1998.
6. **A Report on Water, Sanitation and Family Education in the Rural Areas of Garhwal Himalaya.** It was a community development programme sponsored by World Bank to SBMA, (NGO), Anjanisain, Tehri Garhwal, India, 1999.

- 7. A Report on Geomorphic hazards around Badrinath area (Uttaranchal), and Innovative control measures proposed.** (A report on causative factors, remedial measures and monitoring of suggested engineering structures for snow avalanche and debris avalanche control). Report submitted to the Chairman, Badri - Kedar Temple Committee, Uttarakhand, Director Nanda Devi Biosphere Reserve, Uttarakhand Forests Dept., and MoEnF, Govt. of India, New Delhi.
- 8. Geological Investigation Report** (A Part of Hariyawala Irrigation Canal Stage - II) Sahaspur Block, Dehradun. Report submitted to Irrigation Department, Uttarakhand. 2014.
- 9. Geological Investigation Report** (Site selected for Veterinary College site-I &II) Village – Gahar, Srinagar (Garhwal) Submitted to the registrar Uttarakhand Agricultural University, Bharsar, Pauri Garhwal. 2015.
- 10. Geological Investigation Report** (Site selected for G. N. M. School) Village – Gahar, Srinagar (Garhwal), submitted to Project Manager, UP Rajkiya Nirman Nigam Ltd. Srinagar, Unit –II, 2015.
- 11. Geological Investigation Report** (Site selected for Veterinary College) Village – Ratanpur, Rudraprayag, submitted to Project Manager, UP Rajkiya Nirman Nigam Ltd. Srinagar, Unit –II, 2015.
- 12. Geological Investigation Report** (Site selected for Veterinary College) Village – Shail Gaon (Gauchar), Chamoli, submitted to Project Manager, UP Rajkiya Nirman Nigam Ltd. Srinagar, Unit –II, 2015.
- 13. Comprehensive Geological Report on disaster affected areas of Mandakini and Alaknanda valleys:** Studies are mainly focused on morphological, land use/land cover changes and the rehabilitation status in the valleys after “Kedarnath Tregedy-2013” in higher central Himalayan region of Uttarakhand, submitted to the Secretary, Uttarakhand Disaster Management Department, Dehradun and Department of Geology HNB Garhwal University, Srinagar (Garhwal), 2015.
- 14. Preliminary Assessment on Potentials of Cave-Circuit in Gangolihat area Pithoragarh, Uttarakhand.** Gajendra Singh, Sashank Lingwal and **M.P.S. Bisht**. Uttarakhand Space Application Centre. 2018. Pp.27.
- 15. Report on the Application of Remote Sensing in Glaciers and Water Resources of Uttarakhand.** Asha Thapliyal, Anju Panwar, Manish Rawat and **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. 2019; Pp138.
- 16. Forest Fire Burn Survey Mapping Using Multi Temporal Satellite Data for Uttarakhand State.** Neelam Rawat, Akanksha Rawat, Govind Singh Negi, and **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. 2019; Pp.48.
- 17. Multi Temporal Satellite Data Derived based Information for Forest Fire Monitoring and Management in Uttarakhand.** Neelam Rawat, Vikash Painuly, Govind Singh Negi, Pritam and **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. 2020; Pp.51.
- 18. Exploring Caves of Gangolihat at Pithoragarh: An initiative for promotion of “Cave Tourism in KSL-India.** Gajendra Singh, Lingwal S., **M.P.S. Bisht**. Uttarakhand Space Application Centre. 2021. Pp.29.

19. **Survey and Mapping of Medicinal and Aromatic Plants from Alpine regions of Uttarakhand and Developing of Uttarakhand-Alpine Information System, Uttarakhand** Gajendra Singh, Shasank Lingwal, Naveen Chandra and **M.P.S. Bisht**, Space Application Centre, Dehradun, Uttarakhand. 2021: Pp.212.
20. **Use of High Resolution Data for Mapping of Natural Resources of Randigad Watershed of Pauri District, Uttarakhand.** Neelam Rawat and M.P.S. Bisht Uttarakhand Space Application Centre, Dehradun. 2020. Pp.45.
21. **Report on Higher Plants group (Angiosperm) of Kailash Sacred Landscape-India.** Gajendra Singh, Lingwal S., Chandra N. **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. 2022; Pp.111.
22. **A Report on Geo-statistical Spatial Variability of Soil Nutrients Using Soil Health Card Data (for selected villages of Haridwar and U.S. Nagar, Uttarakhand).** Priyadarshi Upadhyay, **M.P.S. Bisht** and Divya Uniyal, Uttarakhand Space Application Centre, Dehradun. 2022. Pp.178.
23. **Application of Remote Sensing and GIS in Sericulture Development, Phase-II.** Sushma Gairola, Hemant Bisht and **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. 2022. Pp.22.

Academic Achievements:

1. New findings: "***Cordycep Sobolifera***". (a new fungal species first time reported in the NDBR Central Himalaya) - 2004.
2. Contributing author Chapter – VI, **Report of the Study Group on Himalayan Glaciers**, submitted to the Principal Scientific Advisor, Government of India-2010.
3. Contribution in the preparation of **Syllabus** to the B.Sc. and M.Sc. Geology students (especially for the papers viz, Physical and Environmental geology for Undergraduate classes, General Geology and Geomorphology for postgraduate classes) of HNB Garhwal University, Srinagar (Garhwal).
4. Contributing author Chapter – IV, "**Biodiversity Monitoring Expedition**", **Nanda Devi - 2003**, Uttaranchal Himalaya. A by book published by Department of Forest, Uttaranchal-2004.
5. Scientific contribution in the Documentary film of **National Geographic Corporation Ltd**, episode on "**Lake of Skeletons**"- a famous **Roopkund Tragedy** to the popular series "Riddles of the Dead". 2004.
6. Contributing author of the Report on **Ukhimath Tragedy – a natural calamity in 1999**. A Landslide Hazard Monitoring Committee formed by HNB Garhwal University, Srinagar (Garhwal) on behalf of U. P. Government
7. Editor of a Book "**Application of RS & GIS in the Natural Resources Management, Sustainability and Uses**". Trans Media Publishing Co. Srinagar. (2010) pp 265.
8. Co-Editor "**Nirjharni**" (Hindi) – Birla Campus Annual Magazine, 2001- 05.

9. Co-Editor “**UTTARAKHAND YEAR BOOK**” (Hindi & English) - 2009- 10.
10. Contribution in the preparation of **Hindi Dictionary of Geology** for the Commission for Scientific & Technical Terminology, Ministry of HRD. Department of Education, Government of India.
11. Contribution to prepare **VISION DOCUMENT - 2004** of HNB Garhwal University, Srinagar (Garhwal). Presented by Dr. N. Natarajan, Hon’ble Vice-Chancellor and released by HE Shri Sudarshan Agarwal, Governor Utaranchal, at Rajbhawan, Dehradun.
12. Scientific Member of the third “**Biodiversity Monitoring Expedition**”, **Malari to Milam, Nanda Devi Biosphere Reserve Uttarakhand Himalaya - 2005**, Organized by Department of Forest, Uttarakhand.

Honors’ & Awards:

- **CHAIRMAN**; Indian Society of Remote Sensing - DC (Year 2021-24).
- **VICE CHAIRMAN**; Indian Society of Remote Sensing - DC (Year 2020 -21).
- **MEMBER**; Local organizing Committee for the National Conference on “AKASH for LIFE” in November 5-6, 2022 at Dehradun, under the Chairmanship of PSA and Chairman DOS, Government of India.
- **SAMMAAN & SALAAM AWARD – 2022** : Presented by Honorable Minister for Social Justice, Government of India, Sh. Ram Das Athawale and Honorable Governor of Uttarakhand Lt. Gen.(Retd.) Sh. Gurmeet Singh.
- **DEV BHUMI LOK SAMMAAAN - 2022**: Presented by Himgiri Films, New Delhi.
- **SCIENTIFIC ADVISOR – 2022 onward**, “**Sankalp Taru Foundation**”. A tree plantation and Rural Livelihood Support Program connected with GPS and other social technologies.

Administrative Experience:

Post Held	Period	
Head, Department of Geology HNB Garhwal University, Srinagar Garhwal	January 15, 2024	---
Director USAC, Uttarakhand	January 04, 2018	January 16, 2023
Asst. Dean Student Welfare (ADSW) HNBGU, Srinagar Garhwal	2001	2004
Asst. Proctor HNBGU, Srinagar Garhwal	1995	1996
Counsellor in Counselling and Placement Centre	2006	2008

Responsibilities as Director USAC:

From January 2018 to 2023, held the post of Director, Uttarakhand Space Application Centre (U-SAC) as on deputation. The main responsibilities were to apply space-technology for the benefit of the state and its people. U-SAC is one of the nodal agencies, under the Department of Information and Science Technology, Government of Uttarakhand has the mandate to explore the vast potential of Remote Sensing, GIS, Communication and AI technology for the management of natural resources, developmental and planning activities, in the state of Uttarakhand.

Services Provided to the State Line Departments:

S. No	Departments	Activities
1.	Department of Tourism	<ul style="list-style-type: none">• Prepared detailed “Tourism Map of Uttarakhand” (1:10,000 scale) with all the relevant features geo-tagged and formally released by Hon’ble Shri K. K. Paul, Governor of Uttarakhand in 2018.• Provided sound Geotechnical and Ecological inputs to the Secretary tourism for the development of New Kedarnath plan after 2013 disaster.• Identification and prepared a detailed map of floral and faunal diversity of “Old Pilgrimage and Track Routs of Uttarakhand” under the leadership of Director NIM Uttarkashi, during May to June 2019.• To harness the new tourist destination and promote “Cave Tourism” in Uttarakhand. A detailed investigation report of the 10 Lime stone caves of Gangolihat Block of Pithoragarh district and a “Sita Mata Tourist Circuit Map” in Kot Block of Pauri Garhwal has been submitted to the Secretary, Tourism Uttarakhand in 2018-19.• Significant Contributions to find out the 138 years old Original Manuscript of the “Prayer of Lord Badrinath”, written by late Shri Thakur Dhan Singh Bartwal, Saterakhal, Rudraprayag, is now officially accepted and recognised by Board of Shri Badrinath-Kedarnath Mandir Sammiti.• New Finding of the Fossil of Elephant Jaw (Stegodon ganessa) in the Corbett National Park. Such vertebrate fossils first time reported in this park of Siwalik Hills.
2.	Agriculture Department	<ul style="list-style-type: none">• Provided scientific inputs of the annual crop acreage of sugarcane and wheat crops for Haridwar and U.S. Nagar Districts to State Agriculture Department as well as MNCFC GoI. Under FASAL Program.• Providing GIS interpolated soil nutrients maps using Soil Health Card data to state agriculture department for some selected villages of Haridwar and U.S. Nagar.

3.	Forest Department	<ul style="list-style-type: none"> • Provided day to day forest fire location in the state, through MODIS satellite data (NASA) and a comprehensive report for total burnt area submitted annually. • Scientific inputs were also given to the State Forest Department for the conservation and management of forest as well as forested land mainly Bugyals of Uttarakhand. e.g. Geo-Jute technology under CAMPA project has been applied in Dayara and Pindari bugyals • Identified and the Potential distribution and availability/status of 75 Alpine Rare, Endangered, Threatened (RET) and Medicinal-Aromatic Plants (MAPs) of Uttarakhand. • Geo-Tagging and Biodiversity Assessment of Sacred Groves (Dev Van/Dev Braksh) of Uttarakhand. • Characterization and development of Information System-Network for Himalayan Alpine Biodiversity in collaboration with IIRS and other partners is in progress.
4.	Public Works Department (PWD)	<ul style="list-style-type: none"> • Provided Geotechnical inputs in the hazard prone sites of the pilgrimage rout of Kedarnath Shrine through SE, PWD Rudraprayag. • Very High Resolution Satellite data (< 1 meter scale from 2003 to 2020) of Dehradun Township has been provided to PWD, MDDA and Nagar Nigam to find out the change detection or illegal encroachments along the road sides within the townships. • Recently VHS data of Jogiwala to IT park (Shahastradhara) road section for the year 2005, 2012 and 2020 has been provided to PWD Rishikesh Division. • Provided GIS based maps on satellite images of Sahaspur and Raipur blocks as well as Constituency wise Road Network Map at 1:10K of Dehradun to the PWD Dehradun. • Provided GIS based road network maps of eight districts (Almora, Bageshwar, Champawat, Chamoli, Nainital, Pithoragarh, Rudraprayag and Uttarakashi) to SE PWD Dehradun.
5.	Irrigation and Pay Jal Nigam Department	<ul style="list-style-type: none"> • Prepared weir site geo-technical report as well as CAT plan for proposed ten multipurpose water pools along Nayar River, Thal River, Sakmundagad, and Randigad in Pauri District and Gairsain, Ramganga catchment in Chamoli district. • Shared GIS data base for water quality maps, location of springs and wetlands of Uttarakhand to Irrigation Department. • Preliminary survey report on the feasibility of the supply of Glacial melt water to Rain fed streams of Bageshwar and Almora Districts from Pindari catchment submitted to Secretary Pay Jal Nigam, Uttarakhand.

6.	School Education	<ul style="list-style-type: none"> • Hosting USMIS Portal • Upgrading School information with latest UDISE data.
7.	State Planning Commission	<ul style="list-style-type: none"> • Co-ordinating and providing technical support to the State Planning Department regarding Uttarakhand Geospatial Database Management and development of Uttarakhand Geospatial Hub. • Providing all technical support to the Planning and Department of Industry to operate PM's GATI SHAKTI program in the state.
8.	State Urban Planning	<ul style="list-style-type: none"> • Member Expert Committee for the execution of AMRUT project in Uttarakhand.
9.	Department of Geology and Mining	<ul style="list-style-type: none"> • Provided primary to higher secondary school data along with Mining plot areas in the vicinity of leased mining plots of Dehradun and Uttarkashi districts.
10.	Mussoorie Dehradun Development Authority (MDDA)	<ul style="list-style-type: none"> • Prepared Time Series Maps (2005-2018) of high resolution satellite data of a pilot study area (from Prince Chowk to Rispana Bridge and Kath Bangla area) as per the direction of Garhwal Commissioner for identification of encroachment area of MDDA. • Provided Very High Resolution (<1 m scale) Satellite Data (from 2003-2020) of Entire Dehradun Township to the VC MDDA
11.	Tehri Hydro Development Corporation	<ul style="list-style-type: none"> • Survey of fourteen Lake Site villages under the threat of lake water fluctuation from Tehri Lake for the assessment of hazard risk.
12.	Information Technology Development Agency (ITDA)	<ul style="list-style-type: none"> • Provided GIS database of Uttarakhand School, Police Station / Fire Station, Road Network and Village Assets of Pithoragarh District for Bharat Net Phase-II Project of Uttarakhand.
13.	State Disaster Response Force	<ul style="list-style-type: none"> • Provided GPS Data Handling and Visualization hands-on to SDRF officials. • Satellite based Early Information shared with the Authorities of SDRF and Office of the Chief Secretary before and after any natural Calamities occurs in the most inaccessible areas of the State i.e. Heavy Rockfall occurs en route to Kedarnath in 2019, Glacial Lake formation in Niti valley, Impact of Avalanche in Sumna along Rimkhim Nala-2020, Reni-Tapovan Tragedy-2021, along Rishiganga, Landslide Lake formation along Sambhu Gad in Kapkot, Bageshwar District in 2022 and recently during Maldevta Cloudburst - 2022.
14.	Badrinath-Kedarnath	<ul style="list-style-type: none"> • Prepared preliminary Geological Survey Report of proposed new alignment pilgrimage route to Kedarnath Dham.

	Development Board	<ul style="list-style-type: none"> • Provided Geo-technical investigation Report for Phase II work of New Kedarpuri Infrastructure development to the Chief Secretary of the State.
15.	National Highways Authority of India (NHAI)	<ul style="list-style-type: none"> • Prepared new and additional proposed All Weather Road maps (Ponta Shahib to Barkot and Kotdwar to Srinagar). • Geo-technical Investigation Report to find out the Causes of Collapse of Houses during Excavation of Chamba Tunnel on NH- 95. Report Submitted to DM Tehri.
16.	Kumb Mela Kshetra Haridwar	<ul style="list-style-type: none"> • Prepared a comprehensive geospatial data base for Kumbh Mela-2021 and developed information system for Kumbh Mela Kshetra, Haridwar. Final Map and Report submitted to Kumbh Mela Adhikari Haridwar.
17.	Universities /Institutions	<ul style="list-style-type: none"> • Research scholars of various Universities and Institutions get benefitted by the scientific Knowledge as well as the available Satellite based information from USAC during their studies.
18.	State Health Department	<ul style="list-style-type: none"> • Prepared Geo-spatial Information system during first and second phase of Covid-19 for Dehradun Township.

Infrastructure Development of USAC:

Construction of USAC new Building (UTTARAKHAND ANTRIKSH BHAWAN) through BRIDCUL within two years and formally inaugurated by Hon'ble C M Uttarakhand, Shri Trivendra Singh Rawat and Shri A S Kiran Kumar, Ex-Chairman of ISRO in presence of Shri R.K. Sudhanshu, Secretary, Information and Science Technology, on 10/02/2020.

Development of linkages through Memorandum of Understanding (MOU) with various Universities / Institutions:

S. No.	Organization	MoU for	Nature of Work
1.	Kumaun University Nainital	Ph.D. Work	Collaboration to conduct Research and Developmental activities (Ph.D.) activities.
2.	VCSG Uttarakhand University of Horticulture and Forestry, Bharsar, Pauri Garhwal.	Ph.D. Work	Collaboration to conduct Research and Developmental activities (Ph.D.) activities.
3.	National Remote Sensing Center-Hyderabad	Research and Information generation	Thematic mapping of the state at 1:10k scale
4.	GB Pant National Institute of Himalayan Environment	Research and Information generation	Quantification of Medicinal and Aromatic Plants in Alpine region of Uttarakhand

5.	Uttarakhand State Biodiversity Board	Research and Information generation	Landscape level assessment for developing Biodiversity knowledge network
6.	Indian Institute of Remote Sensing, Dehradun	Research and Information generation	Alpine Biodiversity Characterization using Geospatial technique.
7.	Space Application Centre, Ahmedabad	Research and Information generation	Integrated studies of Cryosphere.

External Resource Generation:

To make an institution self-reliant finance is one of the important parameters to define the overall growth of any organization. During the period involved, USAC was able to get external financial support from various organizations of the country. Such a support is utilized for generation of various thematic resources for different line departments, strengthening of department in the form of infrastructure as well as for generation of employment.

Organizations	Project	Nature of Work	Budget (Lakh)
Indian Space Research Organisation (ISRO)	Integrated Watershed Management Programme (IWMP)	Integrated Watershed Management Programme (IWMP) is one of the flagship programmes of the Government of India and is being implemented by the Department of Land Resources (DoLR) in all states of the country at 1:10K scale, coordinated and funded by NRSC, Department of Space (DOS). The work involves monitoring the changes due to implementation of IWMP activities and evaluates the impact accordingly using high resolution imaging along with smart phones.	15.39
	Land Use/Land Cover Analysis (Third Cycle)- 2015-16 project	Land Use/Land Cover Analysis (Third Cycle)- 2015-16 project on 1:50K scale, coordinated and funded by NRSC, Department of Space (DOS). The work essentially involves use of multi-temporal three seasons Resourcesat LISS III orthorectified data of 2015-16 for updating land use/land cover layer along with extensive ground truth collection and to carry out change analysis during 5 years interval.	14.79
	Land Degradation (Second Cycle) 2015-16 project	Land Degradation (Second Cycle) - 2015-16 project on 1:50K scale, coordinated and funded by NRSC, Department of Space (DOS). The work involves use of three seasons Resourcesat LISS III orthorectified data of 2015-16 for updating land degradation layer along with 20% random sample ground checks.	9.04
	National Wastelands Change Analysis -	National Wastelands Change Analysis - 2015-16 project on 1:50K scale, coordinated and funded by NRSC, Department of Space (DOS). Under this project updation of wastelands vector layer of	3.75

	2015-16 project	2008-09 has been done by using orthorectified three season Resourcesat LISS III data of 2015–16 with the help of Bhuvan Web Geo-portal along with 20% random sample ground checks.	
North East Space Application Centre (NESAC)	Application of RS & GIS in Sericulture Development - Phase II (SILKS - 2)	on 1:10K scale coordinated and funded by NESAC, Department of Space (DOS). This project aims to develop GIS map of suitable site for Non-mulberry (Oak Taser) Sericulture Development at higher scale and Geospatial inventory of Sericulture farming.	6.0
National Remote Sensing Centre (NRSC)	Space Based Information Support for Decentralized Planning	Thematic (Land use/Land cover, Drainage and Road/Rail Network) mapping at 1:10k scale of the Uttarakhand state under Space Based Information Support for Decentralized Planning program of NRSC-ISRO	53.00
	Ground water quality mapping Phase -II	Classification of habitation wise legacy ground water quality data. Generation of water quality point map of pre and post monsoon season of surface water bodies. Generation of quality parameter wise ground water quality layers.	23.00
Indian Institute of Remote Sensing (IIRS)	Himalayan Alpine Biodiversity Characterisation	Alpine Biodiversity Characterisation of western Himalaya at community level using geo-spatial and field techniques.	39.00
Ministry of Environment Forest and Climate Change (MoEF & CC)	Main stream Landscape Approach for Biodiversity Conservation & livelihood in the Kailash Sacred Land KSL-India	Undertake landscape level assessment using Rs/GIS tools for identification and extent assessment of critical ecosystems/habitats/sites (including sites of invasion/human wildlife conflict). Development of model biodiversity knowledge network (MBDC) and share with the district administration.	35.00
Ministry of Agriculture MNCFC	Forecasting Agriculture output using Space Agro-metrology and Land based observations (FASAL)	The main objective of this project work is to estimate the acreage of the crop before harvesting and then to estimate the production. In FASAL project USAC is estimating the acreage for some crops in Kharif and Rabi season and for selected district. In Kharif season the selected crop is Sugarcane and is for districts Haridwar and Udham Singh While in Rabi season the acreage of wheat crop is estimated for 8 districts Almora, Dehradun, Pauri, Haridwar, Pithoragarh, Tehri, Udham Singh Nagar and Nainital.	02.00
Ministry of Agriculture	Digital Soil Nutrients Map	The main objectives of this project work are: 1. To perform quality check, re-verify, edit and reconcile of sampling locations of soil nutrient	12.00

		<p>data with respect to village Khasra nos. both provided by state agriculture.</p> <p>2.To prepare the GIS based point and interpolated maps for nutrients e.g. pH, EC, N, P, K, Zn, Fe, Mn, Cu and Br for each aspirational village.</p> <p>USAC is continuously verifying and preparing the soil nutrient interpolated maps based on the soil nutrients data received from the Offices of district agriculture Haridwar and U.S. Nagar.</p>	
Space Application Centre (SAC) ISRO	Integrated studies of Cryosphere studies (ISCH)	Generation of layer of glacier extents using satellite data and comparing the glacier extents. Mapping and change detection of glacier extents using high resolution data of selected glaciers.	15.00
	National Wetland Mapping Phase II Ind	<p>Updation of Wetland Inventory of Uttarakhand at 1:50,000 scale using LISS III data of 2017-18 time frame.</p> <p>Change analysis between wetland inventory GIS database for year 2017-18 and 2006-07 and report preparation.</p>	15.80
	Snow cover & grain size Mapping	<p>Hyperspectral data processing and automatic extraction of Normalized snow difference index.</p> <p>Snow grain index generation and mapping using Hyperspectral data.</p>	11.00

Organization of Seminars/Workshops and Social Outreach Programs:

1. Three days National Seminar and Workshop on Application of Remote Sensing and GIS in the Natural Resources Management, Sustainability and Uses, 11-13 September, 2008, at Department of Geology, HNB Garhwal University, Srinagar (Garhwal), Uttarakhand,
2. Seminar on World Tourism Day 27th September, 2007, Centre for Mountain Tourism and Hospitality Studies, HNB Garhwal University, Srinagar (Garhwal), Uttarakhand.
3. Seminar on Himalaya Day on 9th September, 2015, on the Title theme “Sparsh Himalaya” at Department of Geology, Birla Campus, HNB Garhwal University, Srinagar (Garhwal), Uttarakhand.
4. One Day Seminars on Applications of Remote Sensing and GIS in Various aspects of Natural Resources Management in different parts of Uttarakhand as Director USAC (2018-2023).

1.	One Day Seminar on ‘Applications of Remote Sensing and GIS in Sericulture Development (Phase II)’ association with NESAC, Meghalaya at IRDT Auditorium, Dehradun on 11 th July 2022
2.	One Day Seminar on ‘Application of Remote Sensing & Geographical Information System in Various Aspects of Science and Humanities’ at H.N.B. Garhwal University, Srinagar (Garhwal) on 26 th February 2020
3.	One Day Seminar on ‘Application of Satellite Remote Sensing in Natural Resource Management’ at V.S.K.C. Govt. Degree College, Dakpathar, Vikasnagar (Dehradun) on 18 th February 2020

4.	Inauguration program of USAC Uttarakhand Antariksh Bhawan & Uttarakhand State Geo-informatics Meet 2020 on 10th February 2020
5.	USAC organised a Two Day In-house Capacity Building Training Program on Advanced Geospatial Techniques from 23-24 September 2019
6.	One Day Training Workshop on 'Utilization of Geospatial Technology in Agriculture and Horticulture Sectors' for officials of Agriculture Department at USAC, Technical Division
7.	One Day Capacity Building Program on 'Application of Remote Sensing & GIS in Disaster Management' at Govt. Degree College, Nainidanda, Pauri Garhwal on 31st August 2019
8.	Book Release Ceremony organised by U-SAC at Raj Bhavan Uttarakhand on 17 July 2019
9.	One Day Workshop on 'Use of Geospatial Technology in Natural Resources and Disaster Management' at Ramnagar (Nainital) on 8th May 2019
10.	A short GPS Handling Training given to SDRF Team at USAC Technical Division on 16th April 2019
11.	African-Asian Rural Development Organization (AARDO) member countries participants visited USAC on 28 March 2019
12.	District Level Workshop at Tehri on 'Applications of RS & GIS in Glaciers and Water Resources Management in Uttarakhand' on 11th March 2019
13.	One Day Workshop on 'Role of Space Technology for Disaster Management' at Government Degree College, Thalissain – Pauri on 27th February 2019
14.	One Day Workshop on 'Role of Space Technology for Disaster Management' at Saheed Durgamal Govt. Degree College, Doiwala on 8th February 2019
15.	State Meet – 2019: A one day State level workshop on 'Space based Information Support for Decentralized Planning' (January 15, 2019)
16.	One day Training & Capacity Building Program on "RS & GIS" at H. N. B. Garhwal Univ. Chauras Campus, Srinagar on 24th December 2018
17.	Block Level Workshop at Dasaithal, Gangolihat(Pithoragarh) on 'Applications of RS & GIS in Glaciers and Water Resources Management in Uttarakhand' on 22 December 2018
18.	Block Level Workshop at Dharchula (Pithoragarh) under 'Empowering Panchayati Raj Institutions Spatially (EPRIS)' Project (20-12-2018)
19.	Workshop on Biodiversity Conservation Education under Kailash Sacred Landscape Conservation & Development Initiative (KSLCDI) at Dharchula (Pithoragarh) on 19th December 2018
20.	District Level Workshop at Uttarkashi on 'Applications of RS & GIS in Glaciers and Water Resources Management in Uttarakhand' on 28 November 2018
21.	Block Level Workshop at Gopeshwar (Chamoli) on 'Applications of RS & GIS in Glaciers and Water Resources Management in Uttarakhand' on 25 October 2018
22.	Block Level Workshop at Agustyamuni (Rudraprayag) on 'Applications of RS & GIS in Glaciers and Water Resources Management in Uttarakhand' on 23 October 2018

23.	Block Level Workshops at Gangolihat (05-09-18), Kanalichinna (08-09-18) and Didihaat (13-09-18) Blocks (Pithoragarh) under 'Empowering Panchayati Raj Institutions Spatially (EPRIS)' Project
24.	Review meeting on Ground Water Quality (GWQ) Mapping for Uttarakhand & Himachal Pradesh state under National Rural Drinking Water Program was carried out at USAC from 18-22 June 2018.
25.	Block Level Workshop – Berinag, Pithoragarh under 'Empowering Panchayati Raj Institutions Spatially (EPRIS)' project on 23 May 2018
26.	Two Day Workshop on Applications of Remote Sensing and Geographical Information System (GIS) in the development of tourism in Uttarakhand on 13th and 14th March 2018
27.	Two Day Training Program on "Applications of Space Technology" For the Officers of Office of Accountant General (Audit), Uttarakhand on 1st & 2nd of February 2018.
28.	One day Seminar on 'Application of Satellite Remote Sensing in Natural Resource Management' at V.S.K.C. Govt. Degree College, Dakpathar, Vikasnagar, Dehradun on 18 Feb, 2020.
29.	Two days training on 'Remote Sensing and GIS' for assistant agriculture officers of Haridwar district from 13-14 Jan, 2020
30.	Two days training on 'Remote Sensing and GIS' for assistant agriculture officers of U.S. Nagar district from 20-21 January, 2020.
31.	One day training program for GIS Analyst/Technician of different district GIS cell on 11 February, 2020.
32.	Three days Training Workshop on "Use of Geospatial Technology in Effective Audits" for the Officials of 'Office of Principal Accountant General (Audit), Uttarakhand from November 30 to December 2021.
33.	One Day Workshop on Application of Remote Sensing and GIS in Sericulture Development Phase-II. Venue: IRDT Auditorium on 11 July, 2022
33.	One day Training program for the PG students of PG College Doiwala, Dehradun. Venue: Uttarakhand Antriksh Bhawan (USAC) Dehradun; Role and Application of Space Technology in various Sectors. 13 September, 2022.
33.	Short film also prepared on 'Rishpana to Rishiparna' Released by the Governor Smt. Baby Rani Maurya at Rajbhawan, Uttarakhand.

Outreach Programs Conducted Across the State:

- 1. Geomorphic Features as Vantage Points for Wildlife Tourism in Nanda Devi Biosphere Reserve, Uttarakhand Himalaya.** Presentation in the International Conference on Ecotourism Planning and management in Protected Areas. Mussoorie, (2005).
- 2. Fluvial Dynamic Analysis of the Catastrophic Erosion in Upper Alaknanda Valley Uttarakhand.** Presented in the National Conference on Mass Instability and Earthquake Risk management in Mountainous Regions: Challenges, Lessons Learnt and Future strategy. DMMC, Dehradun (2008).

3. **Impact of Depleting Glaciers on the Biota of Nanda Devi Biosphere Reserve, Uttarakhand Himalaya**, Presentation in the 4th National Meeting on Himalayan Glaciers and Global Climatic Changes at DST, New Delhi. (2008).
4. **Impact of Climatic Changes on the Bio-Geoenvironment of Nanda Devi Biosphere Reserve, Uttarakhand**. Presentation on the occasion of World Tourism Day- 2008, CMTHS, HNB Garhwal University, Srinagar.
5. **A glacial lake outburst in Alkapuri Bank and its impact on downstream of Alaknanda Valley, Uttarakhand**. National Seminar on Landslide Management: Present Scenario and Future Directions. Diamond Jubilee Conference at CBRI Roorkee, Uttarakhand. February 2008.
6. **Serious Concern: Receding Glaciers and Shrinking Ganga**. Presentation at KDMIP Dehradun. Organized by Uttaranchal Utthan Parisad. November 2009.
7. **Nanda Devi Raj Jat – Opportunities and Challenges**. Presented on the occasion of University Youth Club Annual Function, at Swami Manmanthan Auditorium, at Chauras Campus, HNB Garhwal University, Srinagar. April 2010.
8. **Nanda Devi Biosphere Reserve – an overview**. Presented on the occasion of Silver Jubilee Year of PAHAR - a popular magazine by Dr. Shekhar Pathak, Nainital, Uttarakhand. May 2010.
9. **Receding Glaciers and Changing Vegetational Succession in Uttarakhand**. CNR Rao Lecture Series for Science Outreach Program in Gopeshwar, District Chamoli Garhwal, Uttarakhand, 2011.
10. **Changing Face of Himalaya**. Senior level Management group of BKTC and Uttarakhand Tourism Department. At HAPPRC Unit, HNB Garhwal University, Srinagar (Garhwal), 2012.
11. **Hydropower projects their merits and demerits in the Uttarakhand Himalaya**. Presented in Petroleum University, Dehradun, 2013.
12. **Kedarnath Tragedy – 2013 -A Signature of Climate Change**. Col. Brown Cambridge School, Dehradun. 2014.
13. **Geological and Slope Stability factors for Hydropower Development**. Inception workshop on The Hydropower-Irrigation Nexus in the Ganges Headwaters (HI-NEX), Dehradun February 18-20, 2015.
14. **Kedarnath Development Plan - an overview on its Past, Present and Future Geomorphic changes, its impact on the overall Valley Ecosystem**. A Brain storming session (in presence of Prof. Vijay K. Raghavan, Principle Scientific Officer to Priminister of India) at Wildlife Institute of India August 2021.
15. **Impact of Glacial as well as Rock Avalanche in Dhauliganga Basin – a case study of Rishiganga valley (Reni Tapovan Tragedy, 7th January 2021), Uttarakhand Himalaya**. Presented during the State Disaster Response Program organised by Chief Secretary Government of Uttarakhand, in presence of Home Secretary, Government of India, DG DRDO, Member and Director NDRF, Director NRSA, DG ITBP, at Subhash Chandra Bose CS Confrence Hall, Uttarakhand Secreterate. 8-9 January 2021.

16. **Kedarkhand Se Manas Khand Me Himnad Ka Jal Pravah ~ Varsha Jal Pravah Tantra ko Sadaneera Banane ka ek Abhinav Prayas. (An Efforts to First Himalayan River Linking Program under Jal Shakti Mission).** Presented in Presence of Secretary Jal shakti Ministry, Government of India, and Chief Secretary Government of Uttarakhand at CSI Club, Dehradun, 2023.
17. **An Overview on Geological and Socio-Ecological Changes in the Himalayan Terrain During Past Few Decades ~ with special reference to Uttarakhand Himalaya.** Kye note Speech at Dev Bhumi Uttarakhand University, Manduwala Deradun. March, 2023.

Research Publications :

1. **Books - 11**
2. **Papers Published - 93**
3. **Technical Reports - 10**

Books (11)

1. **Application of RS & GIS in the Natural Resources Management, Sustainability and Uses**". Authors, Devendra Pal and **M P S Bisht**. Trans Media Publishing Co. Srinagar. (2010) pp 265.
2. **Socio-Economic Atlas of Uttarakhand**, Authors; K.K. Pal and **M.P.S. Bisht**. Published in collaboration with Raj Bhawan, Dehradun, and Uttarakhand. Allied Printers, Dehradun.2018, p 252.
3. **An Atlas of Kailash Sacred Landscape-India**, Authors: Gajendra Singh, Shashank Lingwal, Arvind Pandey, **M.P.S. Bisht**: Uttarakhand Space Application Centre, Uttarakhand, Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-43-6; p101.
4. **Land Use/ Land Cover Atlas of Uttarakhand**, Prepared Using Resource-2 LISS-III Satellite Data (2015-16). Authors: Sushma Gairola and **M.P.S. Bisht**: Uttarakhand Space Application Centre, Department in Collaboration with National Remote sensing Centre, Hyderabad. Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-52-8; p250.
5. **Geospatial Techniques for Forest Ecology and Climate Change Sectors of Uttarakhand**. Authors: Neelam Rawat, Vikas Painuly, Govind Singh Negi and **M.P.S. Bisht**, Uttarakhand Space Application Centre, Dehradun. Publisher; Dev Bhumi Vichar Manch Prakasan, Dehradun; ISBN: 978-81-938731-3-7; p190.
6. **Remote Sensing and GIS Based Applications in Agriculture Sector**. Authors: Divya Uniyal, Priyadarshi Upadhyay, Govind Singh Negi and **M.P.S. Bisht**, Uttarakhand Space Application Centre, Dehradun. Publisher; Dev Bhumi Vichar Manch Prakasan, Dehradun; ISBN: 978-81-938731-4-4; p76.
7. **An Atlas of Water and Snow Cover Studies of Uttarakhand Using Remote Sensing**. Authors: Asha Thapliyal, Anju Panwar, Manish Rawat and **M.P.S. Bisht**. Uttarakhand Space Application Centre, Dehradun. Publisher; Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-53-5; p136.

8. **An Atlas of Geospatial study of Rispana River.** Authors: Asha Thapliyal, Anju Panwar, and **M.P.S. Bisht.** Uttarakhand Space Application Centre, Dehradun. Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-51-1; p31.
9. **An Atlas of Kailash Sacred Landscape – India.** Authors: Gajendra Singh, **M.P.S. Bisht,** Shashank Lingwal and Arvind Pandey. Uttarakhand Space Application Centre, Dehradun. Pub.; Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-43-6. p102.
10. **Haridwar Maha Kumbh – 2021, GIS Mapping of Kumbh Mela Kshetra.** Authors: Sushma Gairola and **M.P.S. Bisht:** Uttarakhand Space Application Centre, Dehradun. Pub.: Dev Bhumi Vichar Manch Prakasan, Dehradun; ISBN: 978-81-952888-1-6; p202.
11. **Uttarakhand Geospatial Atlas.** Authors: **M. P. S. Bisht** and Hemant Bisht. Uttarakhand Space Application Centre, Dehradun. Publisher; Winsar Publishing Co., Dehradun. ISBN: 978-93-82830-65-8. p140.

Technical Reports (10):

Films:

- ☞ A documentary film (12min) in Hindi “**Mission Rispana to Rishiparna**” based on its Historical, Social and Scientific consideration to rejuvenate in its original form. Released by Shri Governor of Uttarakhand Smt. Bebi Rani Maurya on 18th July, 2019 at Raj Bhawan.

Published Maps: (2):

- ☞ **Uttarakhand Tourism Map:** Prepared by Hemant Bisht and **M. P. S. Bisht.** Uttarakhand Space Application Centre, Dehradun Map includes maximum possible tourist destinations with 1: 460,000 scale. Winsar Publishing Co., Dehradun. 2019.
- ☞ **Uttarakhand Land Use/Land Cover Map:** Prepared by Shushma Gairola and **M. P. S. Bisht.** Uttarakhand Space Application Centre, Dehradun Map includes 39 classes of Land using Resourcesat 2, LISS III Satellite Data 2015-16 with 1:50,000 scale. Winsar Publishing Co., Dehradun. 2019.

Last five year's Publications : (22)

1. Vinit Kumar, Tanuj Shukla, Manish Mehta, D.P. Dobhal, **M.P.S. Bisht** and S.K. Nautiyal (2020). *Glacier Change and associated climate driver for the last three decades, Nanda Devi Region, Central Himalaya, India.* Journal of Quaternary International Elsevier Publication.
2. Gajendra Singh, N. Chnadra, S. Lingwal, **M.P.S. Bisht** and L.M. Tewari (2020). *Distribution and Threat Assessment of an Endemic and Endangered Species *Angelica glauca* in High Ranges of Western Himalaya.* Journal of Herbs, Spices & Medicinal Plants. <https://doi.org/10.1080/10496475.2020.1748783>.
3. Thapliyal, A. and **Bisht, M. P. S.** (2018). *Glacier Retreat of Satopanth and Bhagirath Kharak Glaciers: Using Satellite Data. An International Workshop on Climate Change and Extreme Events in the Himalayan Region.* IIT Mandi campus. 18-20 April, 2019.
4. Uniyal, D. and **Bisht, M. P. S.** (2018). *Riverside tourism development using geospatial and engineering techniques in the part of Central Himalaya.* Published in ISPRS TC V Mid- term Symposium “Geospatial Technology-Pixel to People”20-23 November, 2018.

5. Thapliyal, A. and **Bisht, M. P. S.** (2019). *Monitoring of water quality parameters using RS and GIS approach in catchment of river Ganga*. Workshop on Geospatial Technology: An aid to Ganga rejuvenation. Survey of India, Dehradun.
6. Uniyal, D., Dangwal, S., Gairola, S., Upadhyay, P. and **Bisht, M.P.S.** (2019). *Remote sensing based modeling approach of sentinel-2 data to estimate acreage and production of summer rice crop: 100 square metre field of summer rice crop on ground for a farmer is one pixel of sentinel-2 data for a scientist*. Society and Environment Elsevier.
7. Asha Thapliyal, Anju Panwar and **M.P.S. Bisht** (2019). *Agriculture potential zone identification using GIS Technique in the Hilly Terrain Block of Uttarakashi Block*.
8. Upadhyay, P., Uniyal, D., and **Bisht, M. P. S.** (2019).: *Hyperspectral Remote Sensing for Temperate Horticulture Fruit Crops in Northern-Western Himalayan Region: A Review*, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLII-3/W6, 333-338, <https://doi.org/10.5194/isprs-archives-XLII-3-W6-333-2019>, .
9. Upadhyay, P., **Bisht, M.P.S.** and Uniyal, D. (2021) *Multi-Criteria decision analysis for Site selection of Apple Crop Cultivation: Case study of Nainital, Uttarakhand*. Journal of the Indian Society of Remote Sensing (*springer*)
10. N.Chandra, S.Lingwal, **M.P.S. Bisht**, J.S. Jalal, L.M. Tewari and Gajendra Singh (2021). *Geospatial monitoring of Threatened Medicinal Orchid, Malaxis muscifera (Lindl.) Kuntze in Uttarakhand, Western Himalaya*. Journal of Global Ecology and Environment, 13(1):58-65.
11. N.Chandra, Gajendra Singh, S.Lingwal, **M.P.S. Bisht**, L.M.Tewari and V.C.Joshi (2021). *Ecological status of Alpine medicinal and aromatic plants of Western Himalaya. Journal of Herbs, Spices & Medicinal Plants.* <https://doi.org/10.1080/10496475.2021.1963903>.
12. Chandra N, Singh G, Lingwal S, **Bisht, M.P.S.**, Tewari L.M. (2021). *Habitat preference and availability of medicinal and aromatic plants in alpine meadows of Kumaun Himalaya, Uttarakhand, India*. ENVIS Bulletin on Himalayan Ecology, Vol 28, 2020.
13. N.Chandra, Gajendra Singh, S.Lingwal, **Bisht, M.P.S.** and L.M. Tewari (2021). *Population assessment and habitat distribution modelling of the threatened medicinal plant Picrorhizakurroa Royle ex Benth. in the Kumaun Himalaya, India*. The Journal of Threatened Taxa, 13(7). DOI:10.11609/jott.5603.13.7.18868-18877
14. N.Chandra, Gajendra Singh, S.Lingwal, J.S. Jalal, M.S.Bisht, V.Pal, **Bisht, M.P.S.** B.Rawat and L.M. Tiwari (2021). *Ecological Niche Modeling and status of Threatened Alpine Medicinal Plant Dactylorhiza Hatagirea D.Don in Western Himalaya*. Journal of Sustainable Forestry. <https://doi.org/10.1080/10549811.2021.1923530>.
15. Gajendra Singh, N.Chandra, S.Lingwal, **M.P.S. Bisht** and L.M. Tewari (2020). *Distribution and Threat Assessment of an Endemic and Endangered Species Angelica glauca in High Ranges of Western Himalaya*. Journal of Herbs, Spices & Medicinal Plants. <https://doi.org/10.1080/10496475.2020.1748783>.

16. Gajendra Singh, N.Chandra, V.Pal, L.M.Tewari and **M.P.S. Bisht** (2019). *Observation of Phyto-Diversity of Sunderdunga Valley, Uttarakhand, Western Himalaya*. Indian Forester.
17. Gajendra Singh, N.Chandra, S.Lingwal, and **M.P.S.Bisht** (2018). *Bugyals of Uttarakhand: repository of medicinal and aromatic plants*. ENVIS newsletter on Himalayan Ecology Vol.15(3).
18. Neelam Rawat, A.P. Mishra, N.Chandra, V.Painuly, G.S.Negi, **M.P.S. Bisht** (2021). *MaxEnt Modeling for Predicting the Potential Distribution of Valeriana Jatamansi Jones. in Chakrata Forest Division of Garhwal Himalaya*. Indian Journal of Ecology (2021) 48(2): 367-372.
19. Neelam Rawat, S.Purohit, V.Painuly, G.S.Negi, **M.P.S. Bisht** (2022). *Habitat distribution modeling of endangered medicinal plant Picrorhiza kurroa (Royle ex Benth) under climate change scenarios in Uttarakhand Himalayas, India*. Ecological Informatics 68 (2022) 101550.
20. Singh, G., Lingwal, S. and **Bisht M. P. S.** (2019) *Lesser known Caves around Gangolihat Town in KSL-India: A Tourism Perspective*. Submitted to SANGJU- Newsletter- GBPIHED, Koshi, Katarmal, Almora.
21. Rawat, A., **Bisht, M. P.S.**, Sundriyal, Y. P., Banerjee, S. and Singh Vidushi (2019). *Quantitative Morphometric Analysis and Hypsometry for Assessment of Soil Erosion, Flood Risk and Ground Water Potential of Dhanari Watershed, Uttarkashi District, Uttarakhand, Using Remote Sensing and Geographic Information System*. Int. Soil Water Conserv.Research:http://help.elsevier.com/app/answers/detail/a_id/2210/p/7923
22. **Bisht M.P.S.**, Hemant Bisht, Khayingshing Luirei, Manish Mehta, and Vinit Kumar (2022). *Kuwari Lake; potentially dangerous for landslide lake outburst flood (LLOF)*. Short Communication, Journal of Geological Society of India.2022.



Date: 05/02/2024

(Prof. M. P. S. BISHT)

ANNEXURE- I

Research Publications:

Published Papers:

1. Nainwal, H.C., **Bisht, M. P. S.** and Prasad, C. (1986). *Studies in mass movement in the landslide zone of Kaliyasaur, Garhwal Himalaya (U.P.)*. JOHSARD, Vol. 9 & 10, pp. 77-81.
2. **Bisht, M. P. S.**, Negi, P. S. and Prasad, C. (1989). *Tourism development and road alignments in Garhwal Himalaya, planning and strategies*. Geological Hazards in the Himalayas (Ed.) S.K. Chaddha, Pointer Pub. Jaipur, pp. 125-131.
3. Negi, P. S. and **Bisht, M. P. S.** (1990). *Environmental degradation of Himalayan natural resources due to tourism development - a case study of Himalaya*. (Ed.) S.K. Chaddha, Pointer Pub. Jaipur, pp. 14-24.
4. Prasad, C., **Bisht, M. P. S.**, Nainwal, H.C. and Dharmwan, B.S. (1990). *Study of the Kaliyasaur landslide (Garhwal Himalaya)*. Himalaya, Environment, Resource and Development (Ed.) S.K. Sah, S.D. Bhatt and R.K. Pande, Shree Almora Book Depot, Almora, pp. 43-53.
5. **Bisht, M. P. S.** and Pal, D. (1991). *Effects of reactivation of MCT on stability of hill slopes around Helong area (Garhwal Himalaya) - a case study using remote sensing techniques*. Mountain Resource Management and Remote Sensing (Ed.) P.N. Gupta and A.K.Roy, Surya Pub. Dehradun, pp. 85-92.
6. **Bisht, M. P. S.** and Pal, D. (1992). *Landslides vis-a-vis land degradation in Garhwal Himalaya*. Environmental Crisis in Himalaya. (Ed.) S.K. Chaddha, Pointer Pub. Jaipur.
7. **Bisht, M. P. S.** and Pal, D. (1993). *Parvatiya vikas main bhuskhalan ek pariyavaraniya samasya*. (Hindi). Himalayan Geology Vol. 14, pp. 157-170.
8. **Bisht, M. P. S.** and Prasad, C. (1993). *Study of unculturable wasteland in upper Alaknanda catchment in Garhwal Himalaya*. Disasters Environment and Development (Ed.) R.B. Singh, Oxford & IBH Pub. Co. Pvt. Ltd. New Delhi.
9. Naithani, A. K., Prasad, C. and **Bisht, M. P. S.** (1997). *Landslide zonation and geo-environmental appraisal along Main Central Thrust zone in Mandakini valley, Garhwal Himalaya, U.P. India*. Himalayan Geology Vol.18, pp.135-143.
10. **Bisht, M. P. S.**, Naithani, A. K. and Prasad, C. (1997). *Study of periglacial landforms around Kedarnath, Garhwal Himalaya and their environmental significance*. Jour. Nepal Geol.Soc. 1997, Vol. 16 (Spl. Issue).12/5

11. Naithani, A. K., Prasad, C. and **Bisht, M. P. S.** (1997). *Rock-mass classification and landslide management in a part of Garhwal Himalaya, India*. Natural Hazards in The Urban Habitat, (Ed.) R.N. Iyengar, CBRI, Roorkee, pp. 103-119.
12. **Bisht, M. P. S.** (1999). *Garhwal Himalaya ke pahadi dhalaun par badhte ativrishiti ke kadam parvatiya pariyavaran ke bigadte swaroop ka ek pahalu*. (Hindi) Ashmika, Wadia Himalaya Bhu Vighyan Sansthan, Dehradun. Vol. 5, pp. 105-118.
13. Pal, D., Sharma B.P., Lal, A.K. and **Bisht, M. P. S.** (2001). *Geological and Geomorphological Appraisal*. Garhwal Himalaya: Nature, Culture & Society. (Ed.) O.P. Kandari and O.P. Gusain, Trans Media Publication, Srinagar (Garhwal) India. pp. 57-68.
14. **Bisht, M. P. S.** and Pal, D. (2001). *Problems of landslides and land degradation in Garhwal Himalaya*. Landuse Management and Sustainable Development in U.P. Himalaya; (Ed.) M.S.S. Rawat, R.S. Negi and Mridula Singh, Trans Media Publication Srinagar (Garhwal), India, 2001, pp. 230-245.
15. **Bisht, M. P. S.** (2002). *Role of clay minerals in the acceleration of mass movements - a case study of Darmi landslide, Garhwal Himalaya, U.P., India*. Proceedings of Silver Jubilee National Seminar on Geodynamics and Environment Management of Himalaya. (Eds) H.C. Nainwal and C. Prasad, Dept. of Geology, HNB Garhwal University, Srinagar (Garhwal), Uttaranchal. pp.267-276.
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