

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No.533/2024

IN THE MATTER OF:

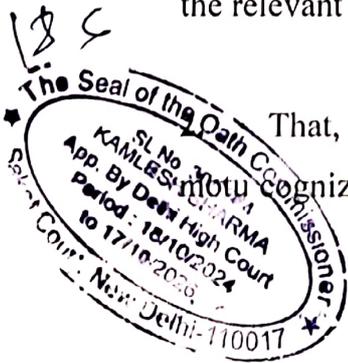
News item titled "Ganges Brahmaputra basins to feel impact of climate change: Report" appearing in the Millenium Post dated 21.03.2024

REPLY AFFIDAVIT ON BEHALF OF SECRETRAY,
DEPARTMENT OF WATER RESOURCES, RIVER
DEVELOPMENT AND GANGA REJUVENATION, MINISTRY OF
JAL SHAKTI, GOVERNMENT OF INDIA (RESPONDENT NO 2)

I, O P Gupta S/o Sh. P C Gupta Aged 53 Years presently posted as Senior Joint Commissioner (PP), Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001, has been duly authorized and hereby solemnly affirm and declare as under: -

1. That, I have been authorized by the competent authority, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India to file the present reply. I have gone through the relevant files and records of the present case maintained in our office.

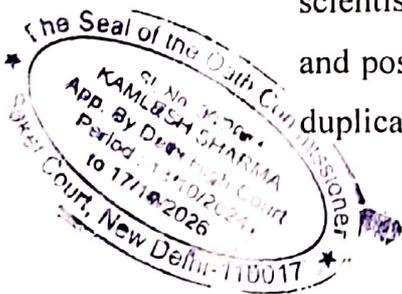
That, in the aforementioned matter, the Hon'ble NGT has taken suo-cognizance, based on the news item appeared in 'Millenium Post dated



[Signature]
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परिचय सयुक्त आयुक्त (सी.जे. एच. योजन) / Sr. Jt. Commissioner (PP)
जल शक्ति मंत्रालय / Ministry of Jal Shakti
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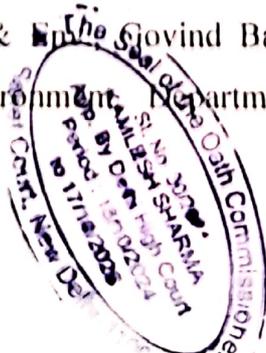
fluctuations. These trends highlight the amplified hydrological impacts under higher emissions with intensified rainfall events and accelerated glacier retreat driving future water availability. Overall the data emphasize the urgent need for climate mitigation to prevent severe reductions in snow cover and to manage the increasing variability in water resources.”

7. That, it is humbly submitted that the study titled “Snow and Glacier Changes and their Impacts on Melt Runoff in a Himalayan Basin,” undertaken in the Himalayan Baspa River basin, was conducted by National Institute of Hydrology (NIH), Roorkee purely for research and development purposes. The core objectives were to assess climate-change impacts on the basin’s cryosphere–hydrology system and to test the applicability of the Spatial Processes in Hydrology (SPHY) model for process-level separation of different runoff components in snow and glacier fed river basin. Specifically, the work explicitly evaluated SPHY’s capability to distinguish snowmelt and glacier-melt contributions within total runoff in the Baspa Himalayan basin and this aspect had not been thoroughly demonstrated for this basin earlier.
8. That, it is humbly submitted that NIH has conducted two trainings on cryosphere-hydrology modelling and data applications linked to this study, and two additional trainings are proposed in the near term. Collectively, these efforts equip State water-resources engineers, scientists, academicians, and researchers to apply process-based tools, and position the Baspa results as a reference for extending robust, non-duplicative methods to other Himalayan basins.




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9. That, it is humbly submitted that the Department of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD & GR), Ministry of Jal Shakti, has established the Centre for Cryosphere and Climate Change Studies (C4S) at the National Institute of Hydrology (NIH), Roorkee, with the objective of conducting studies on the Himalayan cryosphere and its dynamics under a changing climate. The Centre aims to analyze the impacts of climate change on Himalayan glaciers and associated melt runoff. Considering the outcomes of the aforementioned study on Baspa basin, NIH Roorkee has commenced R&D studies on various glaciers in the Indian Himalayan region, including the Gangotri, Milam Glaciers Upper Ganga (Uttarakhand) and Triloki Glacier Bhaga Basin (Himachal Pradesh) for the assessment of impact of climate change in other Himalayan basins.
10. That, it is humbly submitted that, there are large number of stakeholders working in the field of Glacier related studies in their respective capacities. To bring these institutions under a single umbrella, a Steering Committee under the chairmanship of Secretary, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti (MoJS) has been constituted for Monitoring of Glaciers. Members from various national agencies such as National Institute of Hydrology (NIH), National Remote Sensing Centre (NRSC), Indian Institute of Remote Sensing (IIRS), Wadia Institute of Himalayan Geology (WIHG), Geological Survey of India (GSI), Defence Geo-informatics Research Establishment (DGRE), Ministry of Earth Science (MoES), Himachal Pradesh Council for Science, Tech. & Env. The Govind Ballabh Pant National Institute of Himalayan Environment, Department of Science & Technology



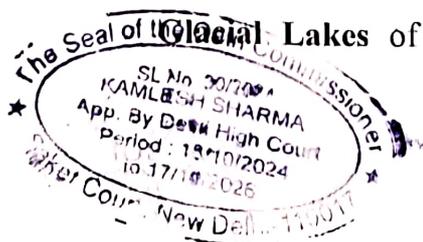
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(DST)- Sikkim, Central Ground Water Board (CGWB), Central Water Commission (CWC) etc are included in the Committee. Total three meetings of the Committee has been held so far.

11. That, it is humbly submitted that, Central Water Commission (CWC) under Ministry of Jal Shakti has prepared **Inventory of Glacial Lakes and Water Bodies** of the Himalayan region of Indian river basins, 2011, in association with National Remote Sensing Centre (NRSC), Hyderabad based on the satellite data of Advanced Wide Field Sensor (AWiFS) of the Indian Remote Sensing Satellite, Resourcesat-1, of resolution 56m, collected from May to November, 2009. The inventory consisted of a total of **2028 Glacial Lakes and Water Bodies** with water spread area greater than **10 Ha** out of which 503 Glacial Lakes & 1525 Water Bodies.

Country-wise Distribution				Basin-wise Distribution			
Country	Glacial Lakes (>10 Ha)	Water Bodies (>10 Ha)	Total (>10 Ha)	Basin Name	Glacial Lakes	Water Bodies	Total
India	60	448	508	Brahmaputra	294	1099	1393
Bhutan	77	124	201	Ganga	178	105	283
Nepal	57	45	102	Indus	31	321	352
China	309	904	1213	Total	503	1525	2028
Myanmar	-	4	4				
Total	503	1525	2028				

- 12 That, it is humbly submitted that, National Remote Sensing Centre (NRSC) has published Glacial Lake Atlas of Indian Himalayan River Basins in the year 2023. The atlas depicts distribution of **28,043 Glacial Lakes** of size greater than **0.25 Ha** mapped using high

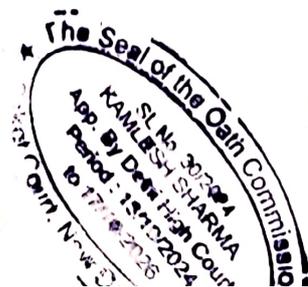


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resolution (5.8 m) Resourcesat-2 LISS-4 MX satellite data of 2016-21.

Size(Ha)	No of Glacial Lakes		Total
	India	Transboundary	
0.25-1	3342	9194	12536
1-5	2862	7769	10631
5-10	712	1733	2445
10-50	596	1536	2132
>50	58	241	299
Total	7570	20473	28043

- 13 That, it is humbly submitted that, Central Water Commission (CWC) under Ministry of Jal Shakti (MoJS) presently monitors 2843 Glacial Lakes and Water Bodies (GL&WBs) of size greater than 10 Ha included from Glacial Lake Inventory 2011 (902 GLs&WBs) & Glacial lake Atlas 2023 (1941 GLs) prepared by NRSC, for the period June to October every year, using remote sensing techniques. High resolution multi-spectral and microwave (SAR) images of Sentinel Satellite at 10 m resolution are processed and analysed in open-source cloud computing platform using automatic algorithm developed in-house. The monthly monitoring report enables detection of relative change in water spread area of GLs & WBs as well as identifying the GLs &WBs which have expanded substantially during the monitoring month, from a disaster perspective. The monitoring reports are shared with all stakeholders and e-published on CWC website for any time access by the concerned. Abstract of state-wise

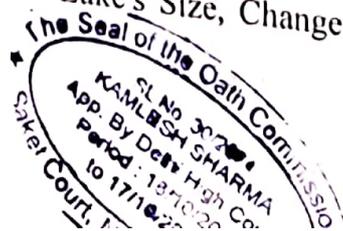


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Abstract of State-wise & Basin-wise details of 1941 GLs as per Glacial Lakes Atlas being monitored monthly by CWC

Country/Area	Glacial Lakes of size greater than 10 Ha as per Glacial Lakes Atlas, 2023				Grand Total (Nos.)
	State/UT	Indus Basin (Nos.)	Ganga Basin (Nos.)	Brahmaputra Basin (Nos.)	
India	Ladakh	164	0	0	164
	Jammu & Kashmir	61	0	0	61
	Himachal Pradesh	5	2	0	7
	Uttarakhand	0	4	0	4
	Sikkim	0	0	30	30
	Arunachal Pradesh	0	0	315	315
	Total	230	6	345	581
	India Total	581			581
Transboundary	Transboundary	49	185	1126	1360
	Total Transboundary	1360			1360
Grand Total	1941				

14 That, it is humbly submitted that CWC has finalized the Criteria for Risk Indexing of Glacial Lakes offering a structured approach for identifying and ranking Glacial Lakes based on their likelihood of failure and the potential damage they could cause in the event of GLOF. This has been done by evaluating key factors such as the Glacial Lake's Size, Change in Size of GL; Stability of Side Slope,



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and basin-wise details of the Glacial lakes & Water Bodies monitored by CWC are given below.

Abstract of State-wise & Basin-wise details of 902 GLs&WBs being monitored monthly by CWC

Country/ Area	State/ Union Territory	No of Glacial Lakes				No of Water Bodies				Grand Total
		Indus Basin	Ganga Basin	Brahm- a- putra Basin	Tota l	Indu s Basin	Ganga Basin	Brahma- putra Basin	Total	
India	Ladakh	15	0	0	15	26	0	0	26	41
	Jammu & Kashmir	15	0	0	15	16	0	0	16	31
	Himachal Pradesh	10	0	0	10	5	0	0	5	15
	Uttarakhand	0	9	0	9	0	6	0	6	15
	Sikkim	0	0	42	42	0	0	1	1	43
	Arunachal Pradesh	0	0	9	9	0	0	25	25	34
	Total	40	9	51	100	47	6	26	79	179
	India Total	100				79				179
Transbounda ry	China	12	110	187	309	49	19	191	259	568
	Bhutan	0	0	71	71	0	0	11	11	82
	Nepal	0	64	0	64	0	9	0	9	73
	Total	12	174	258	444	49	28	202	279	723
	Transbound ary Total	444				279				723
Grand Total		544				358				902

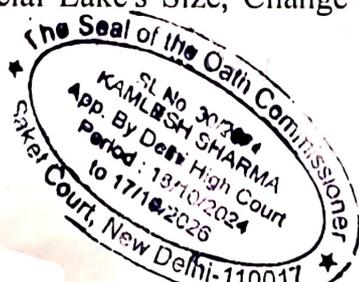
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 to 17/10/2026
 Oath Commission, New Delhi

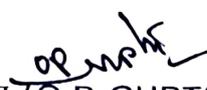
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Proximity to other Glacial Lakes as well as considering Downstream vulnerabilities like Habitation, Infrastructures like Dams, Bridges etc.

15 That the present affidavit may kindly be taken on record so as to assist this Hon'ble Tribunal to pass appropriate orders in the present matter as deemed fit. That it is respectfully submitted the Respondent No 2 undertakes to file a further affidavit if so directed by this Hon'ble Tribunal.

[Signature]
Deponent

ओ.पी. गुप्ता / O.P. GUPTA
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14 OCT 2025

Verification

[Signature]
Signed/ Put T.I in my Presence

Verified at New Delhi on _____ October, 2025 that the averments and facts mentioned herein above are true and correct to the best of my knowledge and belief and nothing material has been concealed there from

The Seal of the Oath Commissioner
Sl. No. 3199
KAMLESH SHARMA
App. By Delhi High Court
Period: 16/10/2024
to 17/10/2026
Oath Commissioner, New Delhi-110017

[Signature]
Deponent

CERTIFIED THAT THE DEPONENT
Shri/Smt./Km. *[Signature]*
S/o, W/o, etc. *[Signature]*
Identified by Shri/Smt. *[Signature]*
has solemnly affirmed that the contents of the affidavit have been read & explained to him/her and are true and correct to the best of his/her knowledge.

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Oath Commissioner, Delhi
Kamlesh Sharma
New Delhi
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