भारत सरकार

केंद्रीय जल आयोग

आकृति विज्ञान एवं जलवायु परिवर्तन निदेशालय

विंग-1, प्रथम तल, पश्चिम खंड -2

आर पुरम के, नई दिल्ली -110066

विषय : Monitoring of Glacial Lakes/Water Bodies in the Himalayan Region of Indian River Basin for June, 2023 – Reg.

CWC has been monitoring Glacial Lakes and Water Bodies (GL&WBs) in the Himalayan Region of Indian River Basins, for the period June to October every year since 2011. This enables detection of relative change in water spread area of GL&WBs as well as identifying the GL&WBs which have expanded substantially during the monitoring period, from a disaster perspective.

2. A total of 902 GL&WBs were considered for monitoring during the year-2023. It includes all Glacial Lakes up to 10 ha and Water Bodies above 50 ha area as per NRSC inventory, 2009. Further, the critical lakes as identified by Swiss agency for Development and Cooperation (SDC) for NDMA in their report titled "Synthesis report on GLOF hazard and risk across the Indian Himalayan Region" have also been included in monitoring.

3. The monitoring was based on automated processing of data-sets of high resolution multi-spectral Images & microwave (SAR) images at 10 m spatial resolution from Sentinel satellites. The monthly monitoring report for the month of June, 2023 is attached herewith for information and necessary action.

यह प्रतिवेदन सदस्य (नदी प्रबंध), केंद्रीय जल आयोग के अनुमोदन से जारी हुआ है।

भवदीय

संलग्न: उपरोक्तानुसार

Signed by Vishnu Deo Roy
Date: 04-08-2023 16:11:36
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सत्यमेव जयते

Monthly Monitoring Report

of

Glacial Lakes & Water Bodies in the Himalayan Region of Indian River Basins

(June, 2023)

Morphology & Climate Change Directorate

Central Water Commission

Department of Water Resources, River Development & Ganga Rejuvenation

Monthly Monitoring Report of Glacial Lakes & Water Bodies in the Himalayan Region of Indian River Basins

(June, 2023)

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Ministry of Jal Shakti, New Delhi

Document Control Sheet

1.	Report / Document Type	Technical report			
2.	Document Control Number	CWC/M&CC/GLWB/ 2023/TR-1			
3.	Title	**Monthly Monitoring Report of Glacial Lakes & Water Bodies in the Himalayan Region of Indian River Basins (June, 2023)**			
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8.	Originating unit	P&D Organization, CWC, New Delhi			
9.	Date of Publication				
10.	Abstract (with Keywords): This document presents the details on monitoring of Glacial Lakes and water bodies in the Himalayan region and Tibetan region, draining to India. The work has been carried out using remote sensing technique. The adopted methodology is indicated in the report. The change in water spread area for 902 GL&WBs has been worked out. The Glacial Lakes requiring vigorous monitoring have been identified for the month of June, 2023. Keywords: Glacial Lake, Water Bodies, Himalayas, Satellite Images, Remote Sensing				

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ABBREVIATIONS	
AR	Arunachal Pradesh
GEE	Google Earth Engine
GL	Glacial Lake
GLOF	Glacial Lake Outburst Flood
FCC	False Colour Composite
ha	Hectare
HP	Himachal Pradesh
J&K	Jammu & Kashmir
LAT	Latitude
LONG	Longitude
LU/LC	Land Use /Land Cover
NDWI	Normalised Difference Water Index
NDMA	National Disaster Management Authority
NRSC	National Remote Sensing Centre
SAR	Synthetic Aperture Radar
SDC	Swiss Agency for Development and Cooperation
SK	Sikkim
TAR	Tibet Autonomous Region
UID	Unique Identification
UK	Uttarakhand
WB	Water Body

Executive Summary

The Himalayan Region (HR) is facing important challenges in view of coping with the adverse effects of climate change. Physically, the shrinking of mountain glaciers and expansion of Glacial Lakes are amongst the most recognizable and dynamic impacts of climate warming in this environment. In combination with this altered stability of surrounding rock and ice walls, the potential threat from Glacial Lake outburst floods (GLOFs) is evolving over time. Therefore, under such changing environment, a close watch on the relative change in water spread area of even smaller lakes has become very crucial in this region.

Remote sensing technique being the most cost effective and reliable approach especially for remote and difficult to access terrain, has been applied for detecting water spread area of such lakes. For analysing and processing large number of remote sensed satellite imageries, Google Earth Engine (GEE), which is an open-source cloud computing platform, has been used. High resolution multi-spectral and microwave (SAR) images at 10m resolution from Sentinel satellite have been analysed. This facilitated in detecting lakes even in cloudy conditions.

The water spread areas for Glacial Lakes and Water Bodies has been calculated in an automatic manner. Manual digitisation of the lakes was carried out wherever required. The algorithm for automation has been developed in-house in GEE. The detailed methodology is included in this report.

For the month of June, 2023, a total of 902 Glacial Lakes and Water Bodies have been monitored. It includes 477 Glacial Lakes & Water Bodies, having water spread area greater than 50 ha, which are being monitored since 2011. All Glacial Lakes having size up to 10 ha as per NRSC inventory, 2009 have been monitored. Further, the critical Glacial lakes as identified by Swiss agency for Development and Cooperation (SDC) for NDMA in their report titled "*Synthesis report on GLOF hazard and risk across the Indian Himalayan Region*" has also been included in monitoring.

The monitoring was based on analysis of 13954 satellite images in the month of June, 2023. From disaster point of view, the base year, average area for last 5 and 10 years, has been considered to determine the maximum change. It was observed that out of 477 GL&WBs having size greater than 50 ha, 22 GL&WBs have shown increase in water spread area greater than 40%, 143 GL&WBs have shown increase in water spread area less than 40%, 13 GL&WBs have shown no change in water spread area, 255 GL&WBs have shown decrease in water spread area, and change detection for remaining GL&WBs could not be performed due to various reasons like frozen condition, dried up condition, cloud cover etc.

Further, for the remaining 425 Glacial Lakes having size up to 10 ha or smaller, the area of the GLs for the year June 2023 was compared with the average area of GL for the year 2022(average of June to October 2022). Out of these, 93 GL have shown an increase in water spread area, 20 GL have shown no change in water spread area, 205 GL have shown decrease in water spread area, and change detection for remaining Glacial Lakes could not be performed.

1. Introduction

1.1 Background

Glacial retreat due to climate change occurring in most parts of the Hindu Kush Himalaya has given rise to the formation of numerous new Glacial Lakes. The water in these Glacial Lakes accumulates behind loose naturally formed 'glacial/moraine dams' made of ice, sand, pebbles and ice residue as the glaciers melt. Different types of lakes may have different levels of hazard potential depending upon many factors like the nature of the damming materials, the position of the lake, the volume of the water, the nature and position of the associated mother glacier, physical and topographical conditions, and other physical conditions of the surroundings. Interaction between the above-mentioned risk factors and triggering processes like ice avalanches, debris flows, rockfall, earthquake or landslides reaching a lake strongly affect the risk of a lake outburst. For instance, moraine-dammed lakes located at the snout of a glacier have a high probability of breaching with high hazard potential whereas there is a reduced risk of breaching in case of erosion lakes.

Glacial Lake Outburst Flood (GLOF) is created when water dammed by a glacier or a moraine is released suddenly. Some of the Glacial Lakes are unstable and particularly moraine dammed lakes are potentially susceptible to sudden discharge of large volumes of water and debris which causes floods downstream. Climate change is expected to alter and potentially increase the probability of lake outbursts in the future.

1.2 Remote Sensing Technology

Remote sensing is the science of acquiring information about the Earth's surface without actually being in contact with it. This is done by sensing and recording reflected or emitted energy and processing, analysing, and applying that information. Satellite remote sensing (SRS) technology has contributed significantly to the acquisition of Earth’s resources, thus helping in their better management. SRS plays a complementary role to other means of spatial data acquisitions i.e., through conventional procedures. Satellite remote sensing offers several unique advantages quick data collection, reliability, more accurate, repetitive collection, geometric integrity and digital storage, which makes it an ideal tool for mapping, inventorying and monitoring the natural resources.

Due to the remote location of Glaciers and Glacial Lakes their access is difficult, owing to tough and difficult terrain. Thus, preparation of inventory of Glacial Lakes using conventional methods requires extensive time and resources together with undergoing hardships in the field. Creating inventories and monitoring of the Glacial Lakes can be done quickly and correctly using satellite images and aerial photographs. Use of these

images and photographs for the evaluation of physical conditions of the area provides greater accuracy. The multi-stage approach using remotely sensed data and field investigation increases the ability and accuracy of the work. Visual and digital image analysis techniques integrated with techniques of geographic information systems (GIS) are very useful for the study of glacier and Glacial Lakes.

1.3 Objectives

The broad objectives of the study are

- To monitor the spatial extent in terms of water spread area of the Glacial Lakes & Water Bodies on monthly basis during June to October.
- To detect changes in water spread area of GL&WBs with respect to historical information & base year.
- To detect any sharp change in area of GL&WBs for disaster purpose
- To share the monitoring reports with concerned stakeholders including National Disaster Management Authority / State Disaster Management Authority.

2. Study Area & Satellite Data Used

2.1 Study Area

The present study area covers the GL&WBs lying in the region of Himalaya and Tibet that drains to India as shown in Figure 2. The study area extends across different countries, namely, India, Nepal, Bhutan and China.

The Glacial Lakes and Water Bodies taken up for the monitoring in the study area are as follows:

- Monitoring of 477 Glacial Lakes and Water Bodies, having water spread area greater than 50 ha which have been included from the inventory of Glacial Lakes & Water Bodies in the Indian Himalayan region using satellite data of the year 2009 prepared by NRSC (Ref: NRSC Report No. NRSC-RS&GISAA-WRG-CWC-Lakes-May2011-TR255).
- Monitoring of 385 Glacial Lakes, having spatial extent greater than 10 ha, which have been taken from the inventory of Glacial Lakes & Water Bodies in the Indian Himalayan region using satellite data of the year 2009 prepared by NRSC (Ref: NRSC Report No. NRSC-RS&GISAA-WRG-CWC-Lakes-May2011-TR255).
- Monitoring of 57 Glacial Lakes, which have been listed as high priority lakes, as per Synthesis report on GLOF hazard and risk across the Indian Himalayan Region prepared by Swiss Agency for Development and Cooperation (SDC) for NDMA.

A total of 902 Glacial Lakes and Water Bodies have been monitored. Of these, 544 are Glacial Lakes and 358 are Water Bodies. All Glacial Lakes upto size of 10 ha as per NRSC 2009 inventory and few more Glacial Lakes of size even smaller than 10 ha as identified by SDC have also been included for monitoring. The breakup of Glacial Lakes and Water Bodies is shown in Figure 1.

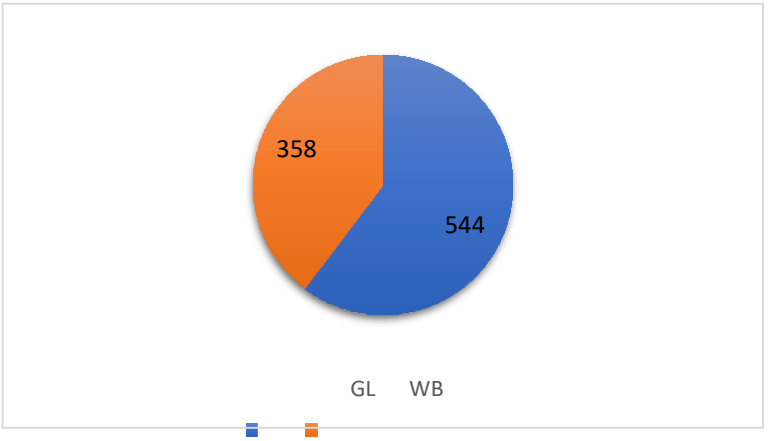

FIGURE 1: LAKE TYPE DISTRIBUTION

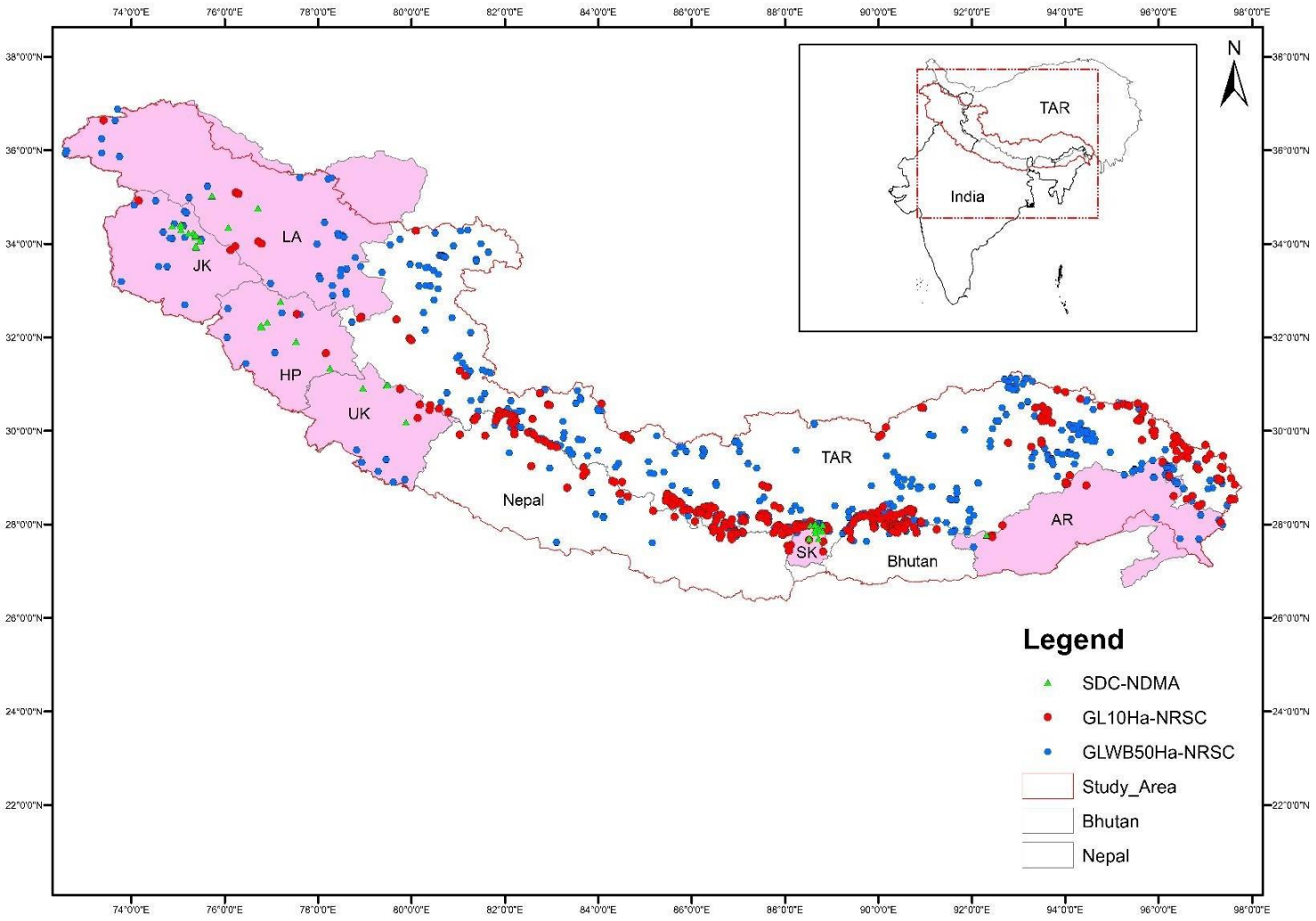

FIGURE 2: LOCATIONS OF GLACIAL LAKES & WATER BODIES IN THE STUDY AREA

2.2 Satellite Data Used

2.2.1 Sentinel-2 MSI

It is a wide-swath, high-resolution, multi-spectral imaging mission, supporting Copernicus Land Monitoring studies, including the monitoring of vegetation, soil and water cover, as well as observation of inland waterways and coastal areas. The SENTINEL-2 Multispectral Instrument (MSI) samples 13 spectral bands: four bands at 10 metres, six bands at 20 metres and three bands at 60 metres spatial resolution. The revisit frequency of each single SENTINEL-2 satellite is 10 day and the combined constellation revisit is 5 day.

2.2.2 Sentinel-1SAR (Micro)

It has C-band synthetic aperture radar (SAR) active sensor can observe the Earth's surface at any time of the day or night, regardless of weather and environmental conditions. SAR has the advantage of operating at wavelengths not impeded by cloud cover or lack of illumination.SAR actively transmits microwave signals towards the Earth and receives a portion of transmitted energy as backscatter from the ground. The SAR instrument provides radar backscatter measurements influenced by the terrain structure and surface roughness. Generally, the more roughness or structure on the ground, the greater the backscatter. Rough surfaces will scatter the energy and return a significant amount back to the antenna resulting in a bright feature. The repeat orbit cycle of each Sentinel-1 satellite is 12-day.

The number of satellite images processed for the month of June- 2023 were 13954. Out of which, 8914 were Multispectral images and 5040 are Microwave images as shown in Figure 3.

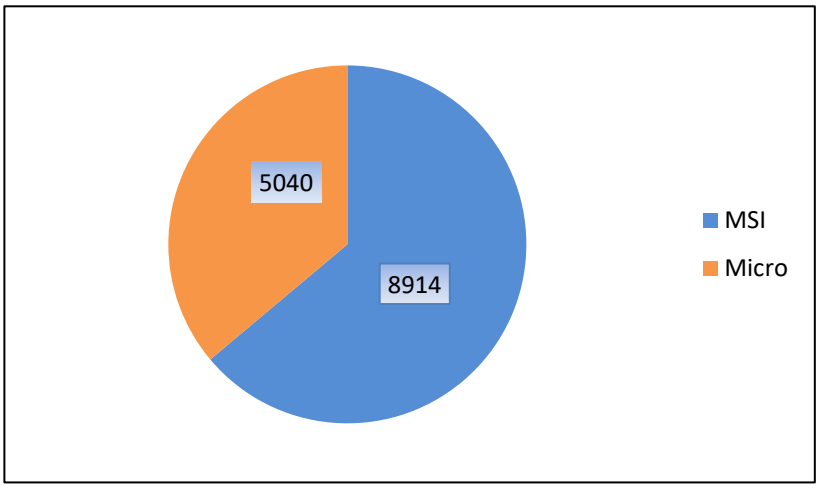

FIGURE 3: ANALYSED SATELLITE IMAGES DISTRIBUTION

3. Methodology

Google Earth Engine (GEE) being a planetary-scale platform for earth science data & analysis, has been used to process the Multispectral and Microwave Sentinel image data for the monitoring of Glacial Lakes & Water Bodies. The Microwave and Multispectral Satellite works on different principle, hence separate methodology has been applied to compute the water spread area of GL&WBs in an automatic manner.

Multispectral data consist of visible and infrared bands. The spectral combination of NIR, red & green bands is used to generate false colour composite (FCC). The Normalised difference water Index (NDWI) is computed using green and NIR band. The process of calculation of NDWI and FCC is repeated for each GL&WB. The OTSU algorithm is further used to identify the threshold of NDWI for segregating water pixels from other types of features. The detected water pixels are further summed to calculate water spread area in the region of interest.

Microwave data of Sentinel-1 is a phase-preserving dual polarisation SAR system. It can transmit a signal in either horizontal (H) or vertical (V) polarisation, and then receive in both H and V polarisations. The backscatter intensity of vertical transmit vertical receive (X) band has been used to distinguish water pixels from other types of features. The OTSU algorithm is further used to identify the threshold of backscatter intensity for segregation. The water spread area of each lake has been calculated by summation of water pixels in the region of interest.

It has also been observed that some lakes are required to the delineated manually based on the visual interpretation of satellite images. This is due to the fact that region being monitored has rugged terrain with steep mountains and valleys, which may lead to effects like foreshortening, layover, mountain shadows etc in the microwave/SAR data. Also, the cloud cover on many occasions hinders the performance of Multispectral satellite data. Thus, creating difficulty in interpreting the signal through automatic means.

The change detection in water spread area of Lake has been calculated for following three cases.

- Difference between the current area of lake and base year
- Difference between the current area of lake and Last five years average area
- Difference between the current area of lake and Last ten years average area

The maximum of change observed in three cases has been adopted to identify increase, decrease and no change in water spread area.

The detailed flow-chart of methodology for automatic monitoring of Glacial Lakes and water bodies using satellite images is given below in Figure 4.

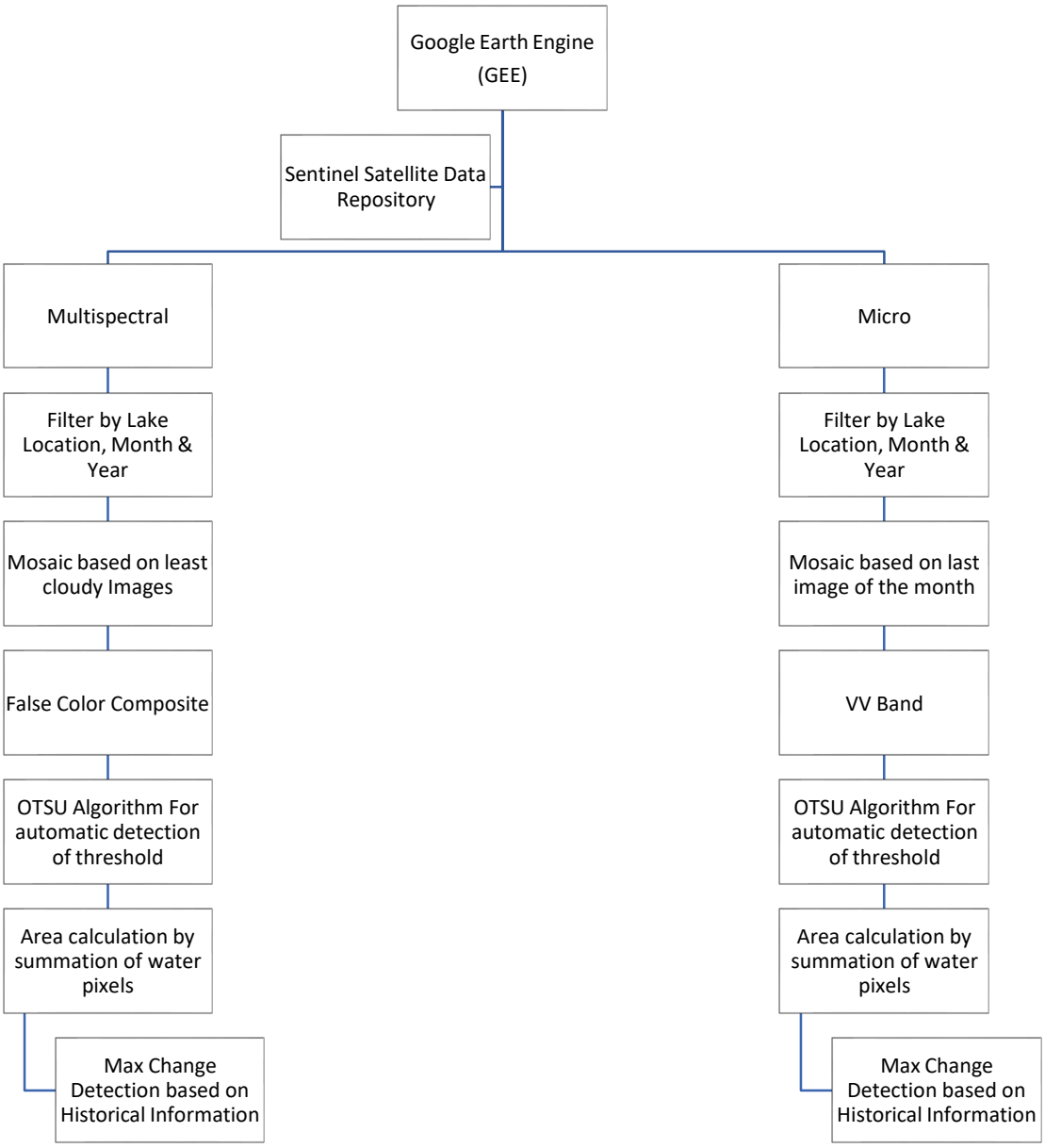

FIGURE 4: METHODOLOGY OF AUTOMATIC MONITORING OF GLACIAL LAKES & WATER BODIES USING SATELLITE IMAGES

4. Results

The water spread area of 902 Glacial Lakes & Water Bodies was calculated for the month of June 2023 in an automatic manner and manually digitised, wherever required using the methodology described above. It includes 477 GL&WBs having size greater than 50 ha which are being monitored since the year 2011 and 425 GL&WBs having size up to 10 ha or smaller being monitored from the year 2022.

For 477 GL & WBs, the water spread area of June, 2023 and maximum detected change in water spread area with respect to base year, last 5 years average area & last 10 years average area is shown in Table 1 to Table 5.

The remaining 425 Glacial Lakes having size up to 10 ha or smaller were monitored from the year 2022. The water spread area for such lakes for the month of June, 2023 and the change detection with respect to average area of the year 2022(June to October 2022) was calculated and is shown Table 6 and Table 7.

It was observed that out of 477 GL&WBs having size greater than 50ha, 22 GL&WBs have shown increase in water spread area greater than 40%, 143 GL&WBs have shown increase in water spread area less than 40%, 13 GL&WBs have shown no change in water spread area, 255 GL&WBs have shown decrease in water spread area, and change detection for remaining GL&WBs could not be performed due to various reasons like frozen condition, dried up condition, cloud cover etc.

Further, out of 425 Glacial Lakes having size up to 10 ha or smaller, 93 GL have shown an increase in water spread area, 20 GL have shown no change in water spread area, 205 GL have shown decrease in water spread area, and change detection for remaining Glacial Lakes could not be performed.

The same is shown in Figure 5.

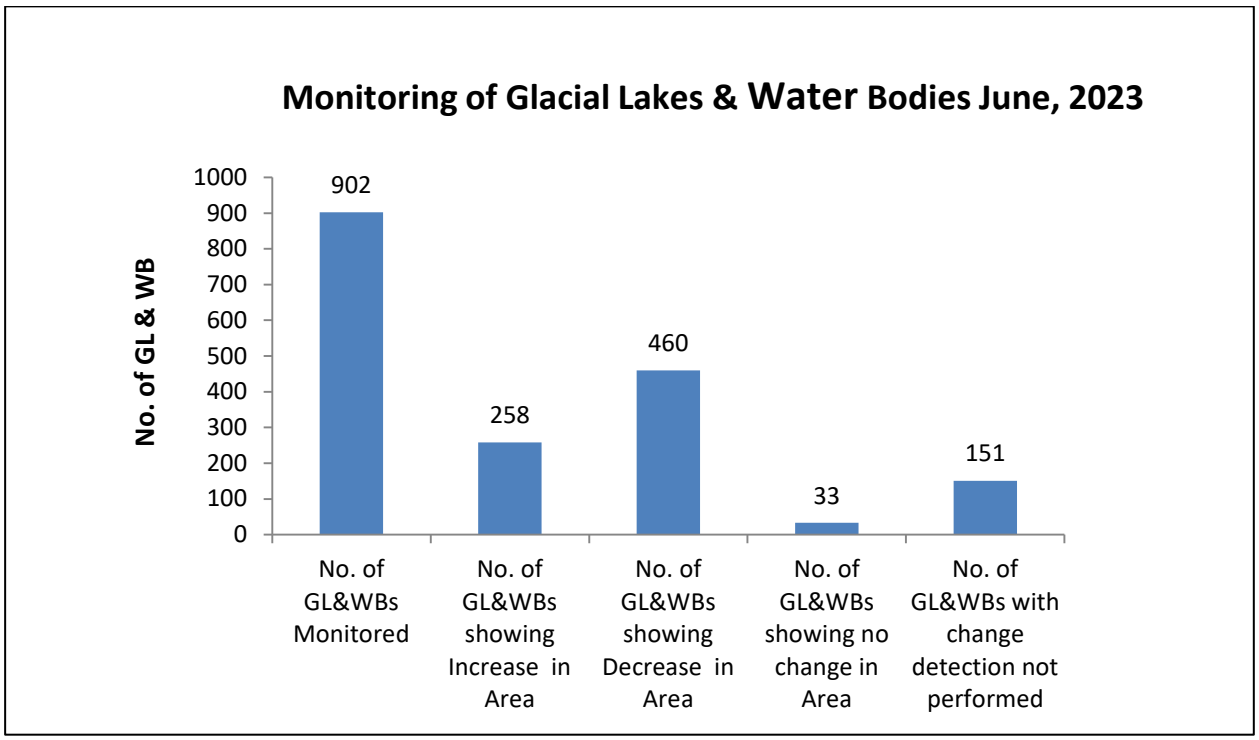

FIGURE 5: OVERALL CHANGES IN WATER SPREAD AREA OF GL&WBS FOR JUNE, 2023

5. Conclusions

- 22 Water Bodies of size greater than 50 ha are required **to be vigorously monitored for disaster purpose**. These water bodies have shown increase in water spread area greater than 40%. 16 are in China, 1 in Nepal, 2 are in Bhutan and 3 are in India, in the State of Aruncahal Pradesh. The details of these lakes have been highlighted in Table 1.
- 51 Glacial Lakes of size greater than 50 ha have shown marginal increase in water spread area ranging from 1 to 40%, while 4 Glacial Lakes of size greater than 50 ha have shown no change and 50 Glacial Lakes of size greater than 50 ha have shown decrease in water spread area.

- Google Earth Engine (GEE) has proved to be a very useful and efficient tool in processing large information equivalent to 13594 satellite images in least possible time.
- Automatic algorithm developed in GEE has expedited the process of calculation of water spread area, which has resulted in increase of monitoring of number of lakes from 477 to 902 without any increase in manpower resource and financial implications.
- Use of Microwave satellite image in conjunction with multispectral satellite image (MSI) has overcome short-comings of cloud cover leading to monitoring of all 902 Lakes in all weather conditions. This has increased availability of satellite images atshorter frequency interval. This will further facilitate in reducing the monitoring interval in future.
- The use of Sentinel satellite image has increased the spatial resolution from 56m to10m leading to enhancement of monitoring accuracy. Sentinel images have also aided in improving the temporal resolution.

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*TABLE 1: LIST OF GL&WBS HAVING WATER SPREAD GREATER THAN 50 HA SHOWING MORE THAN 40% INCREASE IN AREA (**REQUIRING VIGOROUS MONITORING**)*

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
1	03_82O_047	NRSC		CH_1039	3574	WB	Brahmaputra	Dihang	China	46	-	8	16	188
2	03_82O_044	NRSC		CH_1037	3552	WB	Brahmaputra	Dihang	China	85	-	-	35	143
3	03_82K_040	NRSC		CH_896	4329	WB	Brahmaputra		China	62	-	23	27	130
4	03_82K_042	NRSC		CH_898	4364	WB	Brahmaputra		China	191	-	35	85	125
5	03_78I_085	NRSC		BH_166	4764	WB	Brahmaputra	Puna Tsang Chu	Bhutan	69	-	12	31	123
6	02_62J_003	NRSC	254G	NP_19	4854	WB	Ganga	Karnal	Nepal	93	-	45	42	107
7	03_91C_049	NRSC		AP_95	4261	WB	Brahmaputra	Dibang	India	61	-	15	32	91
8	03_92A_005	NRSC		AP_203	3391	WB	Brahmaputra	Luhit	India	48	-	17	27	78
9	03_82K_103	NRSC		CH_959	3964	WB	Brahmaputra		China	40	-	15	23	74
10	03_77P_023	NRSC		CH_593	4235	WB	Brahmaputra	Kuri Chu	China	85	-	50	43	70
11	03_82K_045	NRSC		CH_901	4572	WB	Brahmaputra		China	46	-	28	25	64

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
12	03_91H_017	NRSC		CH_1182	4590	WB	Brahmaputra	Luhit	China	29	-	14	18	61
13	03_82K_007	NRSC		CH_863	4294	WB	Brahmaputra		China	124	-	49	79	57
14	03_82J_024	NRSC		CH_854	4362	WB	Brahmaputra		China	58	-	25	38	53
15	03_91C_070	NRSC		CH_1098	4252	WB	Brahmaputra	Dibang	China	44	-	21	29	52
16	03_82K_049	NRSC		CH_905	4180	WB	Brahmaputra		China	32	-	18	21	52
17	03_91D_009	NRSC		AP_108	4037	WB	Brahmaputra	Dibang	India	55	-	37	30	49
18	03_82F_016	NRSC		CH_741	4632	WB	Brahmaputra		China	46	-	28	31	48
19	03_91H_011	NRSC		CH_1176	4494	WB	Brahmaputra	Luhit	China	53	-	37	32	43
20	03_78M_022	NRSC		BH_197	4549	WB	Brahmaputra	Dangme Chu	Bhutan	80	-	54	56	43
21	03_82K_002	NRSC		CH_858	3998	WB	Brahmaputra		China	80	57	50	44	40
22	03_91H_010	NRSC		CH_1175	4433	WB	Brahmaputra	Luhit	China	102	-	73	66	40

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

- Unobservable (as per NRSC), Ø indicates small rivulet/first order stream

TABLE 2: GL&WBS HAVING WATER SPREAD GREATER THAN 50 HA THAT HAVE SHOWN INCREASE IN WATER SPREAD AREA

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
1	03_78A_021	NRSC		SK_26	5431	GL	Brahmaputra	Teesta	India	77	56	53	50	38
2	03_82O_061	NRSC		AP_54	3811	WB	Brahmaputra	Dibang	India	64	47	41	44	36
3	03_82G_060	NRSC		CH_821	4577	WB	Brahmaputra		China	60	-	34	44	36
4	03_91D_010	NRSC		AP_109	3323	WB	Brahmaputra	Dibang	India	54	-	40	34	35
5	03_91H_040	NRSC		CH_1205	4324	WB	Brahmaputra	Luhit	China	60	-	45	41	33
6	03_91D_080	NRSC		CH_1135	4295	WB	Brahmaputra	Luhit	China	33	-	25	20	32
7	03_62J_031	NRSC		CH_303	4897	GL	Brahmaputra		China	287	174	218	192	32
8	01_61C_010	NRSC		CH_38	4495	WB	Indus	Indus	China	155	94	118	121	28
9	03_91C_078	NRSC		CH_1106	3694	WB	Brahmaputra	Dibang	China	33	-	26	26	27
10	03_78M_019	NRSC		BH_194	4697	WB	Brahmaputra	Dangme Chu	Bhutan	57	-	45	45	27

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
11	03_82N_004	NRSC		CH_975	4290	GL	Brahmaputra		China	133	106	71	75	25
12	03_82J_008	NRSC		CH_838	4036	GL	Brahmaputra		China	209	166	167	165	25
13	03_82O_062	NRSC		AP_55	3612	WB	Brahmaputra	Dibang	India	52	42	9	24	24
14	03_91D_107	NRSC		AP_163	3769	WB	Brahmaputra	Luhit	India	67	-	49	54	24
15	03_82N_030	NRSC		CH_1001	4462	GL	Brahmaputra		China	131	-	106	100	24
16	03_82N_019	NRSC		CH_990	4877	WB	Brahmaputra		China	48	-	39	39	23
17	03_77L_010	NRSC		CH_526	4457	WB	Brahmaputra		China	49	-	40	37	23
18	02_71L_010	NRSC	185G	CH_165	5387	GL	Ganga	Sun Kosi	China	65	-	53	46	23
19	02_71P_054	NRSC		CH_242	4859		Ganga	Arun Kosi	China	93	-	76	75	22
20	01_43K_010	NRSC		JK_111	3946	WB	Indus	Jhelum	India	79	65	60	60	22
21	03_82G_055	NRSC		CH_816	4619	WB	Brahmaputra		China	52	-	31	43	21
22	02_78A_004	NRSC	194G	CH_270	5603	GL	Ganga	Arun Kosi	China	122	85	102	95	20
23	03_92E_001	NRSC		AP_206	4206	WB	Brahmaputra	Luhit	India	51	-	43	30	19

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
24	02_71P_040	NRSC	126G	CH_228	4962	WB	Ganga	Arun Kosi	China	156	131	129	115	19
25	03_62J_016	NRSC		CH_288	5303	GL	Brahmaputra		China	64	-	54	44	19
26	02_72M_016	NRSC	7G	NP_92	4572	GL	Ganga	Arun Kosi	Nepal	235	139	199	163	18
27	01_62E_005	NRSC		CH_80	5174	WB	Indus	Indus	China	234	193	198	187	18
28	03_77D_003	NRSC		SK_3	5098	WB	Brahmaputra	Teesta	India	114	97	93	91	18
29	03_78A_001	NRSC/SDC	/High Risk	SK_9	5371	GL	Brahmaputra	Teesta	India	260	162	149	222	17
30	03_77L_006	NRSC		CH_522	4533	WB	Brahmaputra		China	35	-	30	30	17
31	01_52H_002	NRSC/SDC	4I/Very High Risk	HP_3	4101	GL	Indus	Chenab	India	113	61	97	83	16
32	03_82B_028	NRSC		CH_654	4998	WB	Brahmaputra		China	52	-	45	40	16
33	03_91D_041	NRSC		AP_135	3526	WB	Brahmaputra	Dibang	India	128	110	103	85	16
34	03_77L_043	NRSC		CH_552	5200	GL	Brahmaputra	Kuri Chu	China	220	178	188	189	16
35	02_71P_015	NRSC		CH_203	4153	WB	Ganga	Arun Kosi	China	1230	1031	1059	950	16
36	01_43N_027	NRSC		JK_154	3683	WB	Indus	Jhelum	India	51	-	44	38	16

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
37	03_77L_066	NRSC		BH_34	4896	GL	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	156	134	132	133	16
38	03_82P_010	NRSC		AP_67	1676	WB	Brahmaputra	Dibang	India	94	-	81	68	16
39	03_91C_038	NRSC		AP_85	4002	WB	Brahmaputra	Dibang	India	98	-	73	85	15
40	03_62J_026	NRSC		CH_298	5078	GL	Brahmaputra		China	142	115	123	116	15
41	02_72I_025	NRSC	66G	NP_78	4884	GL	Ganga	Sun Kosi	Nepal	144	102	126	111	14
42	03_82F_022	NRSC		CH_747	4200	GL	Brahmaputra		China	112	98	89	93	14
43	03_78E_023	NRSC		CH_612	5291	GL	Brahmaputra		China	64	-	48	56	14
44	03_91H_005	NRSC		CH_1170	4123	WB	Brahmaputra	Luhit	China	68	56	60	46	13
45	03_62O_040	NRSC		CH_385	4896	WB	Brahmaputra		China	134	112	119	113	13
46	03_82K_074	NRSC		CH_930	4553	WB	Brahmaputra		China	77	-	68	64	13
47	03_78E_026	NRSC		CH_613	5161	GL	Brahmaputra	Amo Chu	China	48	-	43	43	12

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
48	03_62K_002	NRSC		CH_306	4858	WB	Brahmaputra		China	57	-	51	44	12
49	03_62O_002	NRSC		CH_347	4587	WB	Brahmaputra		China	55	47	49	42	12
50	03_77L_042	NRSC		CH_551	5057	GL	Brahmaputra	Kuri Chu	China	69	62	61	60	11
51	03_71C_011	NRSC		CH_404	4684	WB	Brahmaputra		China	169	127	153	138	10
52	03_78I_023	NRSC		BH_104	5055	GL	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	57	52	48	44	10
53	02_71H_029	NRSC	1G	CH_149	5098	GL	Ganga	Sun Kosi	China	531	484	411	452	10
54	01_61B_003	NRSC		CH_28	5074	WB	Indus	Indus	China	239	218	193	196	10
55	02_77D_008	NRSC	266G	CH_263	5285	GL	Ganga	Arun Kosi	China	47	-	43	34	9
56	02_77D_009	NRSC	71G	CH_264	5296	GL	Ganga	Arun Kosi	China	61	56	46	44	9
57	02_62F_019	NRSC	144G	NP_12	5039	WB	Ganga	Karnal	Nepal	70	56	64	59	9
58	03_82J_005	NRSC		CH_835	4134	GL	Brahmaputra		China	81	74	58	60	9
59	02_71P_019	NRSC		CH_207	4199	GL	Ganga	Arun Kosi	China	60	-	55	46	9
60	01_61C_022	NRSC		CH_50	4339	WB	Indus	Indus	China	1697	1494	1560	1459	9

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
61	02_71P_047	NRSC	81G	CH_235	5614	GL	Ganga	Arun Kosi	China	93	82	86	72	8
62	02_72I_027	NRSC	41G	NP_80	4977	GL	Ganga	Sun Kosi	Nepal	84	78	73	73	8
63	03_82G_023	NRSC		CH_784	4377	WB	Brahmaputra		China	82	76	70	65	8
64	03_82B_005	NRSC		CH_631	4888	WB	Brahmaputra		China	232	215	211	203	8
65	02_71L_032	NRSC	122G	CH_187	5250	GL	Ganga	Sun Kosi	China	55	51	51	51	8
66	01_61F_004	NRSC		CH_61	4814	WB	Indus	Indus	China	42331	37181	39073	38352	8
67	02_72I_011	NRSC	1G	NP_64	5034	GL	Ganga	Sun Kosi	Nepal	171	103	160	130	7
68	01_52H_005	NRSC		HP_6	4286	WB	Indus	Chenab	India	46	-	43	38	7
69	03_82G_051	NRSC		CH_812	4735	WB	Brahmaputra		China	45	-	42	35	7
70	01_61C_002	NRSC		CH_30	4494	WB	Indus	Indus	China	883	717	822	779	7
71	03_77L_017	NRSC		CH_533	5340	WB	Brahmaputra		China	81	76	75	71	7
72	01_52K_004	NRSC		JK_212	4293	WB	Indus	Shyok	India	6247	5797	5817	5737	7
73	03_78A_018	NRSC		CH_598	4880	WB	Brahmaputra	Amo Chu	China	56	53	17	30	6
74	03_82O_029	NRSC		CH_1032	3345	WB	Brahmaputra	Dihang	China	72	68	44	45	6

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
75	02_71P_029	NRSC	43G	CH_217	5045	GL	Ganga	Arun Kosi	China	108	76	102	82	6
76	02_78A_003	NRSC	24G	CH_269	5522	GL	Ganga	Arun Kosi	China	161	131	152	137	6
77	03_62J_011	NRSC		CH_283	5181	WB	Brahmaputra		China	402	355	380	365	6
78	01_42H_001	NRSC		JK_1	4292	WB	Indus	Gilgit	India	285	264	268	254	6
79	02_71L_001	NRSC		CH_156	5106	WB	Ganga	Arun Kosi	China	90	81	85	82	6
80	01_62F_004	NRSC		CH_95	5493	WB	Indus	Satluj	China	202	186	191	181	6
81	03_77L_033	NRSC		BH_13	5176	GL	Brahmaputra		Bhutan	207	186	197	185	5
82	02_53O_001	NRSC		UK_4	1968	WB	Ganga	Ramganga	India	42	-	40	33	5
83	03_82K_017	NRSC		CH_873	4397	WB	Brahmaputra		China	163	-	146	155	5
84	01_61G_002	NRSC		CH_63	4663	WB	Indus	Indus	China	1378	1218	1308	1264	5
85	03_62O_042	NRSC		CH_387	4964	WB	Brahmaputra		China	61	58	56	55	5
86	02_71L_006	NRSC	3G	CH_161	5365	GL	Ganga	Arun Kosi	China	398	372	380	341	5
87	03_78A_009	NRSC		SK_16	5044	GL	Brahmaputra	Teesta	India	64	61	55	52	5
88	01_61C_016	NRSC		CH_44	4289	WB	Indus	Indus	China	396	377	364	360	5

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
89	02_71H_015	NRSC		CH_135	5367	GL	Ganga	Arun Kosi	China	568	540	537	524	5
90	02_71L_004	NRSC	5G	CH_159	5518	GL	Ganga	Arun Kosi	China	119	78	114	92	4
91	02_71P_043	NRSC	18G	CH_231	5206	GL	Ganga	Arun Kosi	China	80	66	77	64	4
92	03_82J_004	NRSC		CH_834	3957	GL	Brahmaputra		China	546	378	526	474	4
93	01_62E_006	NRSC		CH_81	5055	WB	Indus	Indus	China	542	516	522	506	4
94	03_62N_022	NRSC		CH_339	4599	WB	Brahmaputra		China	202	193	194	187	4
95	03_77N_004	NRSC		CH_563	3890	WB	Brahmaputra		China	1306	1257	1238	1231	4
96	03_82O_064	NRSC		AP_57	3689	WB	Brahmaputra	Dihang	India	38	-	37	31	3
97	01_62F_010	NRSC	9I	CH_101	5250	GL	Indus	Satluj	China	69	-	67	53	3
98	03_78M_020	NRSC		BH_195	4157	WB	Brahmaputra	Dangme Chu	Bhutan	61	59	54	56	3
99	02_72M_007	NRSC	33G	CH_253	4950	GL	Ganga	Arun Kosi	China	100	88	97	89	3
100	02_72M_009	NRSC	51G	NP_86	4932	GL	Ganga	TamurKosi	Nepal	66	-	64	56	3
101	03_77P_019	NRSC		CH_590	4637	WB	Brahmaputra	Dangme Chu	China	272	237	263	240	3

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
102	03_77H_008	NRSC		CH_482	4570	WB	Brahmaputra		China	1293	1250	1134	1147	3
103	03_77K_015	NRSC		CH_517	4455	WB	Brahmaputra		China	111	106	108	106	3
104	02_71H_001	NRSC		CH_121	4580	WB	Ganga	Arun Kosi	China	27733	26974	26951	26898	3
105	03_78E_009	NRSC		CH_605	4580	WB	Brahmaputra		China	182	176	168	164	3
106	01_62F_002	NRSC		CH_93	4592	WB	Indus	Satluj	China	344	334	320	316	3
107	03_91C_029	NRSC		CH_1078	4229	WB	Brahmaputra		China	227	221	218	211	3
108	02_62P_004	NRSC		NP_37	807	WB	Ganga	Trisuli	Nepal	407	385	394	389	3
109	01_61C_005	NRSC		CH_33	4495	WB	Indus	Indus	China	390	153	384	279	2
110	01_61C_005	NRSC		CH_33	4495	WB	Indus	Indus	China	390	153	384	279	2
111	03_82F_014	NRSC		CH_739	4691	GL	Brahmaputra		China	46	-	45	35	2
112	02_72I_023	NRSC	227G	NP_76	5232	GL	Ganga	Sun Kosi	Nepal	84	82	70	72	2
113	01_62E_004	NRSC		CH_79	5161	WB	Indus	Indus	China	252	227	248	238	2
114	03_77L_013	NRSC		CH_529	5191	WB	Brahmaputra		China	348	342	327	315	2
115	02_72I_014	NRSC	6G	NP_67	4574	GL	Ganga	Sun Kosi	Nepal	167	149	164	163	2

116	03_82A_002	NRSC		CH_621	4905	WB	Brahmaputra		China	390	351	382	355	2
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
117	03_71G_013	NRSC		CH_422	4543	WB	Brahmaputra		China	282	228	277	250	2
118	03_82B_002	NRSC		CH_628	4906	WB	Brahmaputra		China	457	449	436	422	2
119	03_62O_041	NRSC		CH_386	4963	WB	Brahmaputra		China	219	208	214	205	2
120	03_78E_019	NRSC		CH_611	5022	GL	Brahmaputra		China	63	60	62	58	2
121	01_61C_001	NRSC		CH_29	4526	WB	Indus	Indus	China	11779	11304	11562	11424	2
122	02_71H_002	NRSC		CH_122	4650	WB	Ganga	Arun Kosi	China	2521	2353	2466	2390	2
123	01_62A_003	NRSC		CH_69	5142	WB	Indus	Indus	China	1415	1385	1343	1304	2
124	01_52K_009	NRSC		JK_217	4921	WB	Indus	Shyok	India	210	205	196	191	2
125	03_71G_007	NRSC		CH_416	5153	WB	Brahmaputra		China	193	188	189	187	2
126	03_71B_002	NRSC		CH_392	5388	WB	Brahmaputra		China	8395	8251	8211	8132	2
127	03_77P_004	NRSC		CH_575	4452	WB	Brahmaputra		China	220	205	216	205	2
128	02_71P_016	NRSC		CH_204	4182	WB	Ganga	Arun Kosi	China	153	151	139	124	1
129	02_71L_028	NRSC	38G	CH_183	5027	GL	Ganga	Sun Kosi	China	99	82	98	91	1

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
130	03_78A_014	NRSC/SDC	/Very High Risk	SK_20	5234	GL	Brahmaputra	Teesta	India	142	132	140	125	1
131	02_71H_003	NRSC		CH_123	4649	WB	Ganga	Arun Kosi	China	223	193	220	211	1
132	02_72M_005	NRSC	139G	CH_251	5141	GL	Ganga	Arun Kosi	China	80	79	78	69	1
133	02_62P_003	NRSC	4G	NP_36	4937	GL	Ganga	Trisuli	Nepal	333	330	320	298	1
134	02_71L_023	NRSC	39G	CH_178	5106	GL	Ganga	Arun Kosi	China	129	124	128	121	1
135	03_77D_004	NRSC/SDC	/Very High Risk	SK_4	5287	GL	Brahmaputra	Teesta	India	123	113	122	112	1
136	02_71H_028	NRSC	15G	CH_148	5174	WB	Ganga	Sun Kosi	China	197	194	194	195	1
137	03_62N_009	NRSC		CH_326	5241	WB	Brahmaputra		China	295	289	292	280	1
138	01_52O_001	NRSC		CH_4	4242	WB	Indus	Shyok	China	68950	66075	67960	66500	1
139	03_91C_025	NRSC		CH_1076	4022	GL	Brahmaputra		China	114	107	113	107	1
140	01_62F_003	NRSC		CH_94	4586	WB	Indus	Satluj	China	41720	40806	41185	41037	1
141	03_78E_012	NRSC		CH_607	4576	WB	Brahmaputra		China	283	274	280	267	1
142	03_62J_013	NRSC		CH_285	4934	WB	Brahmaputra		China	943	935	933	911	1

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
143	03_77H_020	NRSC		CH_490	4473	WB	Brahmaputra		China	5046	4976	4525	4594	1

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

- Unobservable (as per NRSC), Ø indicates small rivulet/first order stream

TABLE 3: GL&WBS HAVING WATER SPREAD GREATER THAN 50 HA THAT HAVE SHOWN NO CHANGE IN WATER SPREAD AREA

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
1	03_82O_016	NRSC		CH_1023	4374	WB	Brahmaputra	Dihang	China	94	94	21	41	0
2	03_91C_034	NRSC		AP_84	4288	WB	Brahmaputra	Dibang	India	157	157	59	80	0
3	03_82J_025	NRSC		CH_855	4038	WB	Brahmaputra		China	59	59	45	41	0
4	03_77L_044	NRSC		BH_19	4385	GL	Brahmaputra	Puna Tsang Chu	Bhutan	121	121	103	110	0
5	02_71L_026	NRSC	73G	CH_181	5057	GL	Ganga	Sun Kosi	China	67	56	67	62	0
6	03_82B_009	NRSC		CH_635	4963	WB	Brahmaputra		China	176	176	174	166	0
7	03_77L_001	NRSC		CH_520	4443	WB	Brahmaputra		China	56700	56442	54547	54439	0
8	01_52N_001	NRSC		CH_3	4964	WB	Indus	Indus	China	12320	11883	12283	12099	0
9	03_82E_007	NRSC		CH_725	5043	WB	Brahmaputra		China	68	68	68	65	0
10	03_78A_013	NRSC		SK_19	5470	GL	Brahmaputra	Teesta	India	81	74	81	77	0
11	01_43J_017	NRSC	3I	JK_95	3580	WB	Indus	Jhelum	India	160	160	159	153	0

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
12	03_77L_041	NRSC		CH_550	5214	GL	Brahmaputra	Kuri Chu	China	61	-	61	57	0
13	01_61H_001	NRSC		CH_66	4619	WB	Indus	Indus	China	317	317	315	287	0

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

- Unobservable (as per NRSC), Ø indicates small rivulet/first order stream

TABLE 4: GL&WBS HAVING WATER SPREAD GREATER THAN 50 HA THAT HAVE SHOWN DECREASE IN WATER SPREAD AREA

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
1	02_71D_004	NRSC	16G	NP_45	4064	GL	Ganga	Trisuli	Nepal	97	75	98	90	-1
2	03_82C_010	NRSC		CH_665	4921	WB	Brahmaputra		China	148	149	120	128	-1
3	03_82E_002	NRSC		CH_720	5008	WB	Brahmaputra		China	692	675	701	613	-1
4	01_61C_021	NRSC		CH_49	4349	WB	Indus	Indus	China	1179	1147	1195	1071	-1
5	01_43N_022	NRSC		JK_149	4243	WB	Indus	Jhelum	India	73	74	72	68	-1
6	03_82B_008	NRSC		CH_634	4928	WB	Brahmaputra		China	260	262	262	254	-1
7	01_62J_001	NRSC		CH_102	4784	WB	Indus	Satluj	China	5735	5525	5774	5583	-1
8	03_62N_001	NRSC		CH_318	5102	WB	Brahmaputra		China	14682	14352	14856	14616	-1
9	03_82J_017	NRSC		CH_847	3829	WB	Brahmaputra		China	283	287	284	279	-1
10	02_62K_010	NRSC		NP_28	2975	WB	Ganga	Karnal	Nepal	1042	1054	1048	1026	-1
11	03_82A_007	NRSC		CH_626	4911	WB	Brahmaputra		China	91	87	93	88	-2
12	03_82B_015	NRSC		CH_641	5124	WB	Brahmaputra		China	82	84	78	76	-2

13	03_82B_020	NRSC		CH_646	4986	WB	Brahmaputra		China	46	-	47	41	-2
S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
14	03_62O_032	NRSC		CH_377	5012	WB	Brahmaputra		China	54	-	55	45	-2
15	01_61C_014	NRSC		CH_42	4279	WB	Indus	Indus	China	304	305	311	298	-2
16	01_52K_014	NRSC		JK_222	4535	WB	Indus	Indus	India	435	446	413	410	-2
17	03_71G_006	NRSC		CH_415	5065	WB	Brahmaputra		China	946	970	955	933	-2
18	02_72M_006	NRSC	349G	CH_252	5188	GL	Ganga	Arun Kosi	China	65	64	66	61	-2
19	01_61D_002	NRSC		CH_54	4313	WB	Indus	Indus	China	1626	1654	1562	1461	-2
20	03_71K_002	NRSC		CH_425	4974	WB	Brahmaputra		China	2311	2369	2288	2280	-2
21	03_82E_003	NRSC		CH_721	5027	WB	Brahmaputra		China	96	98	95	94	-2
22	03_82F_030	NRSC		CH_755	3485	WB	Brahmaputra		China	2671	2735	2694	2665	-2
23	01_52O_005	NRSC		CH_8	4358	WB	Indus	Indus	China	813	829	792	757	-2
24	03_91C_044	NRSC		AP_90	4230	WB	Brahmaputra	Luhit	India	62	64	52	52	-3
25	03_78M_003	NRSC		CH_614	4459	WB	Brahmaputra	Dangme Chu	China	209	215	168	186	-3
26	03_77L_014	NRSC		CH_530	5289	WB	Brahmaputra		China	36	-	37	36	-3
27	03_82G_050	NRSC		CH_811	4734	WB	Brahmaputra		China	39	-	40	34	-3

28	03_62O_024	NRSC		CH_369	4637	WB	Brahmaputra		China	865	740	894	814	-3
S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
29	01_52K_010	NRSC		JK_218	5313	WB	Indus	Shyok	India	144	148	140	136	-3
30	01_61C_024	NRSC		CH_52	4323	WB	Indus	Indus	China	4949	4733	5107	4842	-3
31	02_71L_013	NRSC	58G	CH_168	5324	GL	Ganga	Sun Kosi	China	57	57	59	56	-3
32	01_61C_015	NRSC		CH_43	4280	WB	Indus	Indus	China	809	777	832	770	-3
33	01_52K_012	NRSC		JK_220	4695	WB	Indus	Indus	India	155	160	159	156	-3
34	03_71O_009	NRSC		CH_445	4302	WB	Brahmaputra		China	2149	2111	2210	2129	-3
35	01_43A_001	NRSC		JK_22	3641	WB	Indus	Gilgit	India	201	196	208	194	-3
36	03_82K_077	NRSC		CH_933	4590	WB	Brahmaputra		China	96	-	99	94	-3
37	03_77L_037	NRSC		BH_15	5139	GL	Brahmaputra		Bhutan	581	599	599	578	-3
38	01_61F_003	NRSC		CH_60	5256	WB	Indus	Indus	China	550	565	536	512	-3
39	03_62N_017	NRSC		CH_334	5454	WB	Brahmaputra		China	78	79	80	77	-3
40	01_61C_018	NRSC		CH_46	4291	WB	Indus	Indus	China	1968	1958	2037	1901	-3
41	03_82F_004	NRSC		CH_729	4508	WB	Brahmaputra		China	689	713	701	690	-3
42	01_43J_020	NRSC		JK_98	1584	WB	Indus	Jhelum	India	179	185	168	164	-3
43	01_52L_001	NRSC		JK_225	4523	WB	Indus	Satluj	India	13975	14351	14180	14105	-3
44	03_77K_017	NRSC		CH_519	4448	WB	Brahmaputra		China	3681	3807	3760	3734	-3

45	01_43J_022	NRSC		JK_100	1583	WB	Indus	Jhelum	India	62	62	64	59	-3
S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
46	02_78A_005	NRSC		CH_271	5376	GL	Ganga	Arun Kosi	China	111	91	110	116	-4
47	03_77D_002	NRSC		SK_2	5156	GL	Brahmaputra	Teesta	India	107	112	101	96	-4
48	03_77P_012	NRSC		CH_583	4975	WB	Brahmaputra		China	70	73	61	56	-4
49	03_77P_009	NRSC		CH_580	5086	WB	Brahmaputra		China	102	104	106	100	-4
50	01_43J_007	NRSC	6I	JK_85	3708	WB	Indus	Jhelum	India	98	92	102	92	-4
51	01_61D_004	NRSC		CH_56	4991	WB	Indus	Indus	China	522	501	546	511	-4
52	03_91C_024	NRSC		CH_1075	3977	GL	Brahmaputra		China	285	287	298	280	-4
53	01_62E_010	NRSC		CH_85	5233	WB	Indus	Indus	China	157	164	155	146	-4
54	03_82D_004	NRSC		CH_710	4481	WB	Brahmaputra		China	368	375	382	372	-4
55	01_62F_001	NRSC		CH_92	4571	WB	Indus	Satluj	China	24611	25680	25164	25241	-4
56	03_77K_009	NRSC		CH_511	3937	WB	Brahmaputra		China	66	67	69	67	-4
57	03_78M_016	NRSC		CH_617	4647	WB	Brahmaputra	Dangme Chu	China	143	151	117	128	-5
58	02_71P_027	NRSC	82G	CH_215	5389	GL	Ganga	Arun Kosi	China	52	-	55	40	-5
59	01_52C_003	NRSC	7I	JK_187	4512	GL	Indus	Indus	India	57	-	60	49	-5
60	03_62K_001	NRSC		CH_305	4834	WB	Brahmaputra		China	376	396	395	376	-5

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
61	02_71H_007	NRSC		CH_127	5149	GL	Ganga	Arun Kosi	China	116	122	120	117	-5
62	03_82G_045	NRSC		CH_806	4523	WB	Brahmaputra		China	70	73	74	69	-5
63	02_71L_003	NRSC		CH_158	5324	WB	Ganga	Arun Kosi	China	263	276	273	267	-5
64	03_82F_007	NRSC		CH_732	4801	GL	Brahmaputra		China	114	120	119	113	-5
65	03_82B_021	NRSC		CH_647	5041	WB	Brahmaputra		China	49	52	44	39	-6
66	03_82A_004	NRSC		CH_623	5008	WB	Brahmaputra		China	46	-	49	42	-6
67	03_62O_038	NRSC		CH_383	4893	WB	Brahmaputra		China	128	128	136	130	-6
68	03_77H_011	NRSC		BH_4	4963	GL	Brahmaputra		Bhutan	152	161	158	142	-6
69	03_77H_030	NRSC		CH_495	4802	WB	Brahmaputra		China	58	62	58	56	-6
70	03_82J_023	NRSC		CH_853	4315	WB	Brahmaputra		China	97	101	103	99	-6
71	02_71H_008	NRSC		CH_128	5152	GL	Ganga	Arun Kosi	China	103	99	109	101	-6
72	03_82B_006	NRSC		CH_632	4837	WB	Brahmaputra		China	118	121	125	120	-6
73	01_43A_002	NRSC		JK_23	3790	WB	Indus	Gilgit	India	98	96	104	95	-6

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
74	02_71H_017	NRSC		CH_137	5314	GL	Ganga	Arun Kosi	China	479	512	485	475	-6
75	03_77L_012	NRSC		CH_528	5014	WB	Brahmaputra		China	27193	28995	29060	28965	-6
76	03_82F_008	NRSC		CH_733	4828	WB	Brahmaputra		China	83	84	88	83	-6
77	01_52L_002	NRSC		JK_226	4986	WB	Indus	Indus	India	398	406	423	408	-6
78	03_82B_004	NRSC		CH_630	4893	WB	Brahmaputra		China	97	98	103	98	-6
79	03_78E_007	NRSC		BH_60	5008	GL	Brahmaputra	Puna Tsang Chu	Bhutan	62	67	47	52	-7
80	03_82G_019	NRSC		CH_780	4460	WB	Brahmaputra		China	54	58	40	47	-7
81	03_78E_017	NRSC		CH_609	5253	GL	Brahmaputra		China	43	-	38	46	-7
82	03_77D_008	NRSC		SK_8	5039	GL	Brahmaputra	Teesta	India	43	-	46	35	-7
83	03_82K_075	NRSC		CH_931	4511	WB	Brahmaputra		China	112	-	120	102	-7
84	02_72I_003	NRSC	319G	NP_59	4762	GL	Ganga	Sun Kosi	Nepal	39	-	42	36	-7
85	03_82G_035	NRSC		CH_796	4386	WB	Brahmaputra		China	82	80	88	74	-7
86	01_61C_011	NRSC		CH_39	4494	WB	Indus	Indus	China	502	434	539	472	-7

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
87	03_71O_006	NRSC		CH_442	4738	WB	Brahmaputra		China	107	104	115	109	-7
88	02_71L_002	NRSC		CH_157	5261	WB	Ganga	Arun Kosi	China	75	71	81	79	-7
89	01_61C_023	NRSC		CH_51	4350	WB	Indus	Indus	China	628	672	622	599	-7
90	02_77D_007	NRSC	244G	CH_262	5215	GL	Ganga	Arun Kosi	China	55	58	59	56	-7
91	03_77J_003	NRSC		CH_499	5039	WB	Brahmaputra		China	85	91	85	84	-7
92	01_52K_016	NRSC		JK_224	4675	WB	Indus	Satluj	India	518	555	523	514	-7
93	03_77P_017	NRSC		CH_588	4751	WB	Brahmaputra	Dangme Chu	China	2187	2357	2097	2184	-7
94	02_71L_011	NRSC	61G	CH_166	5439	GL	Ganga	Sun Kosi	China	51	55	54	53	-7
95	03_82G_009	NRSC		CH_770	4580	WB	Brahmaputra		China	43	-	46	46	-7
96	03_82O_054	NRSC		CH_1046	3311	WB	Brahmaputra	Dibang	China	47	51	19	33	-8
97	02_72I_004	NRSC	9G	CH_244	5074	GL	Ganga	Sun Kosi	China	184	125	201	174	-8
98	03_82K_006	NRSC		CH_862	4523	WB	Brahmaputra		China	44	48	40	44	-8
99	02_71H_021	NRSC	76G	CH_141	4463	GL	Ganga	Trisuli	China	44	-	48	40	-8
100	02_71P_025	NRSC		CH_213	4807	WB	Ganga	Arun Kosi	China	117	110	127	107	-8
101	01_52J_001	NRSC	8I	JK_197	5311	GL	Indus	Shyok	India	96	104	96	92	-8

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
102	01_62E_003	NRSC		CH_78	5104	WB	Indus	Indus	China	145	148	157	148	-8
103	02_71H_027	NRSC	2G	CH_147	5242	GL	Ganga	Sun Kosi	China	441	480	441	437	-8
104	01_61C_012	NRSC		CH_40	4282	WB	Indus	Indus	China	303	317	330	308	-8
105	01_43P_002	NRSC		JK_167	669	WB	Indus	Ravi	India	54	58	59	55	-8
106	03_71G_001	NRSC		CH_410	5163	WB	Brahmaputra		China	693	741	753	732	-8
107	03_82F_020	NRSC		CH_745	4110	GL	Brahmaputra		China	68	71	74	68	-8
108	03_82K_018	NRSC		CH_874	4168	WB	Brahmaputra		China	160	175	65	92	-9
109	03_82K_039	NRSC		CH_895	4128	WB	Brahmaputra		China	192	211	131	167	-9
110	03_71K_003	NRSC		CH_426	4982	WB	Brahmaputra		China	79	73	87	76	-9
111	02_71P_022	NRSC	34G	CH_210	5439	GL	Ganga	Arun Kosi	China	75	82	82	70	-9
112	03_82D_003	NRSC		CH_709	4408	WB	Brahmaputra		China	42	46	44	43	-9
113	03_82B_007	NRSC		CH_633	4964	WB	Brahmaputra		China	188	206	207	196	-9
114	01_43K_014	NRSC		JK_115	3521	WB	Indus	Jhelum	India	125	134	138	126	-9
115	01_52O_003	NRSC		CH_6	4252	WB	Indus	Indus	China	201	220	196	181	-9
116	03_71K_006	NRSC		CH_429	4847	WB	Brahmaputra		China	1979	2173	2088	2036	-9

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
117	03_92A_006	NRSC		AP_204	1178	WB	Brahmaputra	Luhit	India	75	82	80	78	-9
118	03_62J_001	NRSC		CH_273	5449	WB	Brahmaputra		China	138	151	143	140	-9
119	03_71C_005	NRSC		CH_398	5551	GL	Brahmaputra		China	53	58	56	54	-9
120	03_78I_048	NRSC		BH_129	4169	WB	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	47	52	32	38	-10
121	03_77L_035	NRSC		BH_14	5486	GL	Brahmaputra		Bhutan	64	71	49	52	-10
122	03_77D_005	NRSC/SDC	/Very High Risk	SK_5	5249	GL	Brahmaputra	Teesta	India	88	98	94	84	-10
123	03_77L_068	NRSC		BH_36	4764	WB	Brahmaputra	Kuri Chu	Bhutan	74	82	69	73	-10
124	03_62N_021	NRSC		CH_338	5432	WB	Brahmaputra		China	180	200	185	183	-10
125	02_71D_007	NRSC		NP_48	700	WB	Ganga	Trisuli	Nepal	265	294	281	280	-10
126	03_82E_004	NRSC		CH_722	5049	WB	Brahmaputra		China	43	48	48	46	-10
127	03_82G_062	NRSC		CH_823	4925	WB	Brahmaputra		China	52	-	58	54	-10

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
128	03_77L_077	NRSC		BH_45	5136	WB	Brahmaputra	Puna Tsang Chu	Bhutan	49	55	10	29	-11
129	01_61G_003	NRSC		CH_64	4864	WB	Indus	Indus	China	71	80	58	64	-11
130	03_91C_014	NRSC		CH_1065	4033	GL	Brahmaputra		China	40	-	45	42	-11
131	01_43N_020	NRSC		JK_147	4112	WB	Indus	Jhelum	India	58	65	61	58	-11
132	02_71H_035	NRSC		CH_155	4366	WB	Ganga	Sun Kosi	China	42	-	47	41	-11
133	01_42H_003	NRSC		JK_3	3854	WB	Indus	Gilgit	India	106	119	109	101	-11
134	03_82A_003	NRSC		CH_622	4896	WB	Brahmaputra		China	89	100	92	91	-11
135	03_62J_015	NRSC		CH_287	5207	WB	Brahmaputra		China	76	80	85	82	-11
136	03_77H_023	NRSC		CH_492	5313	WB	Brahmaputra		China	36	-	41	33	-12
137	03_83A_012	NRSC		AP_77	4287	WB	Brahmaputra	Dangme Chu	India	53	60	39	46	-12
138	01_43E_006	NRSC		JK_30	4186	WB	Indus	Gilgit	India	66	75	66	66	-12
139	03_82K_036	NRSC		CH_892	4251	WB	Brahmaputra		China	56	64	38	36	-13
140	03_82K_020	NRSC		CH_876	4364	WB	Brahmaputra		China	74	85	48	54	-13
141	03_91C_046	NRSC		AP_92	3353	WB	Brahmaputra	Dibang	India	52	60	43	46	-13

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
142	03_71P_001	NRSC		CH_448	5302	WB	Brahmaputra		China	113	130	130	127	-13
143	03_62O_030	NRSC		CH_375	5013	WB	Brahmaputra		China	97	99	111	101	-13
144	03_82K_009	NRSC		CH_865	4168	WB	Brahmaputra		China	94	109	60	82	-14
145	03_78I_018	NRSC		BH_99	5083	GL	Brahmaputra	Puna Tsang Chu	Bhutan	59	69	68	65	-14
146	03_77L_027	NRSC		CH_543	4531	WB	Brahmaputra	Kuri Chu	China	161	188	173	168	-14
147	01_43J_021	NRSC		JK_99	1582	WB	Indus	Jhelum	India	1121	1305	992	1028	-14
148	03_62J_012	NRSC		CH_284	4883	WB	Brahmaputra		China	144	164	168	159	-14
149	01_62E_013	NRSC		CH_88	5345	WB	Indus	Indus	China	146	169	167	159	-14
150	03_82N_033	NRSC		CH_1004	4357	GL	Brahmaputra		China	73	86	69	67	-15
151	03_82G_048	NRSC		CH_809	4663	WB	Brahmaputra		China	39	38	46	43	-15
152	03_91H_067	NRSC		AP_185	3791	WB	Brahmaputra	Luhit	India	40	-	44	47	-15
153	02_77D_006	NRSC		CH_261	4894	GL	Ganga	Arun Kosi	China	82	89	92	97	-15
154	03_78E_006	NRSC		CH_604	4572	WB	Brahmaputra		China	55	65	59	56	-15

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
155	03_77P_021	NRSC		CH_592	4749	GL	Brahmaputra	Dangme Chu	China	54	64	45	47	-16
156	03_71O_010	NRSC		CH_446	4296	WB	Brahmaputra		China	855	850	1017	920	-16
157	03_77H_012	NRSC		CH_483	4723	GL	Brahmaputra		China	68	81	80	76	-16
158	03_82G_024	NRSC		CH_785	4647	WB	Brahmaputra		China	90	108	78	76	-17
159	03_82K_060	NRSC		CH_916	4316	WB	Brahmaputra		China	82	99	71	68	-17
160	03_62O_039	NRSC		CH_384	4555	WB	Brahmaputra		China	254	306	294	286	-17
161	03_62N_004	NRSC		CH_321	5168	WB	Brahmaputra		China	772	899	925	900	-17
162	03_77L_011	NRSC		CH_527	4533	WB	Brahmaputra		China	1068	1282	1200	1150	-17
163	01_52J_005	NRSC		JK_201	5430	WB	Indus	Shyok	India	36	-	44	37	-18
164	02_71D_008	NRSC		NP_49	639	WB	Ganga	Trisuli	Nepal	85	104	102	98	-18
165	03_77L_067	NRSC		BH_35	5231	GL	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	71	87	68	71	-18
166	03_82K_068	NRSC		CH_924	4320	WB	Brahmaputra		China	45	55	54	50	-18
167	03_91C_064	NRSC		AP_100	3972	WB	Brahmaputra	Dibang	India	59	-	72	65	-18

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
168	03_77C_006	NRSC		CH_460	4514	WB	Brahmaputra		China	83	101	93	91	-18
169	03_82G_017	NRSC		CH_778	4437	WB	Brahmaputra		China	48	59	51	50	-19
170	03_71G_008	NRSC		CH_417	5187	WB	Brahmaputra		China	50	62	60	59	-19
171	01_62E_002	NRSC		CH_77	5139	WB	Indus	Indus	China	140	173	157	149	-19
172	03_77L_029	NRSC		CH_545	5451	GL	Brahmaputra	Kuri Chu	China	44	-	54	43	-19
173	03_82K_037	NRSC		CH_893	4147	WB	Brahmaputra		China	44	55	21	30	-20
174	03_78I_056	NRSC		BH_137	4794	WB	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	67	84	46	57	-20
175	03_82K_080	NRSC		CH_936	4530	WB	Brahmaputra		China	39	-	49	37	-20
176	03_71G_011	NRSC		CH_420	4619	WB	Brahmaputra		China	1170	1236	1461	1318	-20
177	01_52G_003	NRSC		JK_191	4533	WB	Indus	Indus	India	1295	1609	1315	1335	-20
178	03_77L_051	NRSC		BH_22	4548	GL	Brahmaputra	Puna Tsang Chu	Bhutan	129	142	162	150	-20
179	01_52I_003	NRSC		JK_195	5159	WB	Indus	Shyok	India	168	186	211	169	-20
180	03_82J_018	NRSC		CH_848	3913	GL	Brahmaputra		China	78	94	97	92	-20

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
181	01_43G_001	NRSC		JK_67	346	WB	Indus	Jhelum	India	18289	22572	22977	22344	-20
182	01_43N_032	NRSC		JK_159	3595	WB	Indus	Jhelum	India	48	-	61	50	-21
183	03_82B_010	NRSC		CH_636	4990	WB	Brahmaputra		China	39	50	47	41	-22
184	03_91C_069	NRSC		AP_101	3245	WB	Brahmaputra	Dibang	India	56	72	46	45	-22
185	03_82C_016	NRSC		CH_671	4679	WB	Brahmaputra		China	42	54	50	52	-22
186	01_52D_001	NRSC		HP_1	780	WB	Indus	Ravi	India	654	819	838	768	-22
187	03_82G_065	NRSC		CH_826	4148	WB	Brahmaputra		China	46	-	55	59	-22
188	01_53A_001	NRSC		HP_9	409	WB	Indus	Beas	India	17259	22072	18290	17771	-22
189	03_82L_009	NRSC		CH_971	3893	GL	Brahmaputra		China	46	55	60	54	-23
190	03_78M_010	NRSC		BH_188	4496	WB	Brahmaputra	Dangme Chu	Bhutan	27	-	35	33	-23
191	03_71G_014	NRSC		CH_423	4606	WB	Brahmaputra		China	170	139	222	181	-23
192	03_77H_013	NRSC		CH_484	4950	GL	Brahmaputra		China	40	-	52	43	-23
193	01_52L_003	NRSC		JK_227	4985	WB	Indus	Indus	India	525	680	573	594	-23
194	03_91C_033	NRSC		CH_1079	4278	GL	Brahmaputra		China	147	190	177	161	-23
195	01_52O_002	NRSC		CH_5	5262	WB	Indus	Indus	China	89	115	112	102	-23
196	01_42H_005	NRSC		JK_5	2237	WB	Indus	Gilgit	India	55	72	60	54	-24

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
197	03_77P_006	NRSC		CH_577	4616	WB	Brahmaputra		China	4432	5796	5293	4301	-24
198	03_78A_003	NRSC/SDC	/Very High Risk	SK_11	4977	GL	Brahmaputra	Teesta	India	56	-	74	57	-24
199	01_52G_001	NRSC		JK_189	5008	WB	Indus	Shyok	India	33	-	44	38	-25
200	03_91D_081	NRSC		CH_1136	3356	WB	Brahmaputra	Luhit	China	319	436	312	247	-27
201	03_91H_029	NRSC		CH_1194	3325	WB	Brahmaputra	Luhit	China	36	-	49	37	-27
202	02_71P_035	NRSC		CH_223	5146	WB	Ganga	Arun Kosi	China	79	108	98	98	-27
203	03_77P_018	NRSC		CH_589	4707	WB	Brahmaputra	Dangme Chu	China	112	153	129	131	-27
204	01_61D_003	NRSC		CH_55	4453	WB	Indus	Indus	China	46	64	62	50	-28
205	03_82B_014	NRSC		CH_640	4825	WB	Brahmaputra		China	112	155	152	127	-28
206	03_77L_072	NRSC		BH_40	5201	GL	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	63	88	79	82	-28
207	03_71C_003	NRSC		CH_396	5412	GL	Brahmaputra		China	37	-	52	45	-29
208	01_43M_003	NRSC		JK_120	2663	WB	Indus	Shigar (Indus)	India	159	198	224	220	-29

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
209	02_53K_001	NRSC		UK_1	355	WB	Ganga	Ramganga	India	3945	5557	5371	5332	-29
210	03_78E_029	NRSC		BH_73	4250	WB	Brahmaputra	Puna Tsang Chu	Bhutan	23	-	33	28	-30
211	03_82O_042	NRSC		AP_49	3093	WB	Brahmaputra	Dibang	India	30	-	43	36	-30
212	01_53E_001	NRSC		HP_12	921	WB	Indus	Beas	India	76	70	109	95	-30
213	03_78E_010	NRSC		CH_606	4582	WB	Brahmaputra		China	30	-	43	37	-30
214	01_52J_002	NRSC		JK_198	5359	WB	Indus	Shyok	India	47	67	61	59	-30
215	03_77H_018	NRSC		CH_488	4699	WB	Brahmaputra		China	58	75	83	77	-30
216	02_71P_028	NRSC		CH_216	4997	GL	Ganga	Arun Kosi	China	42	44	58	61	-31
217	02_53P_003	NRSC		UK_11	207	WB	Ganga	Ramganga	India	790	1138	842	844	-31
218	03_82J_020	NRSC		CH_850	3852	WB	Brahmaputra		China	301	439	348	383	-31
219	03_82D_010	NRSC		CH_716	5043	WB	Brahmaputra	Dangme Chu	China	48	70	49	57	-31
220	03_77P_016	NRSC		CH_587	4749	WB	Brahmaputra	Dangme Chu	China	181	262	224	227	-31
221	01_62E_015	NRSC		CH_90	5415	WB	Indus	Satluj	China	34	50	49	46	-32
222	03_77L_032	NRSC		CH_547	4669	GL	Brahmaputra	Kuri Chu	China	74	111	80	82	-33

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
223	01_61F_002	NRSC		CH_59	5279	WB	Indus	Indus	China	42	63	54	50	-33
224	01_53A_002	NRSC		HP_10	495	WB	Indus	Satluj	India	8184	12198	11339	11603	-33
225	03_77H_003	NRSC		CH_478	4714	WB	Brahmaputra		China	153	231	148	145	-34
226	03_77H_004	NRSC		CH_479	4428	WB	Brahmaputra		China	136	205	149	150	-34
227	03_77B_002	NRSC		CH_453	5019	WB	Brahmaputra		China	164	248	210	206	-34
228	01_43J_004	NRSC	5I	JK_82	4078	WB	Indus	Jhelum	India	46	70	68	63	-34
229	03_71K_007	NRSC		CH_430	4752	WB	Brahmaputra		China	63	96	82	80	-34
230	03_71K_009	NRSC		CH_432	4750	WB	Brahmaputra		China	167	258	218	193	-35
231	02_53O_005	NRSC		UK_8	239	WB	Ganga	Ramganga	India	831	1284	1263	1160	-35
232	03_62K_009	NRSC		CH_313	5079	GL	Brahmaputra		China	199	265	312	291	-36
233	02_62B_001	NRSC		CH_106	5216	WB	Ganga	Karnal	China	28	42	45	40	-38
234	03_71G_010	NRSC		CH_419	4491	WB	Brahmaputra		China	191	310	262	259	-38
235	03_78E_028	NRSC		BH_72	2161	WB	Brahmaputra	Puna Tsang Chu	Bhutan	26	-	44	35	-41
236	03_77P_013	NRSC		CH_584	5155	WB	Brahmaputra		China	37	64	52	48	-42

S.No	Lake_ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevatio n (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
237	02_72I_002	NRSC	645G	NP_58	4854	GL	Ganga	Sun Kosi	Nepal	38	65	60	59	-42
238	03_71G_009	NRSC		CH_418	5032	WB	Brahmaputra		China	90	155	156	148	-42
239	01_62B_001	NRSC		CH_73	4526	WB	Indus	Satluj	China	254	472	301	316	-46
240	02_77D_001	NRSC		CH_256	4423	WB	Ganga	Arun Kosi	China	2454	4849	3677	3583	-49
241	02_53K_002	NRSC		UK_2	260	WB	Ganga	Ramganga	India	744	1481	1000	918	-50
242	03_71O_002	NRSC		CH_438	4909	WB	Brahmaputra		China	24	-	49	44	-51
243	02_71L_034	NRSC	89G	CH_188	5095	GL	Ganga	Sun Kosi	China	30	-	69	55	-57
244	01_61D_001	NRSC		CH_53	5593	WB	Indus	Indus	China	33	81	76	66	-59
245	03_82J_014	NRSC		CH_844	3703	WB	Brahmaputra		China	72	183	158	147	-61
246	02_72I_007	NRSC	785G	NP_62	4540	GL	Ganga	Sun Kosi	Nepal	27	-	70	67	-61
247	03_77H_001	NRSC		CH_476	4275	WB	Brahmaputra		China	192	521	353	361	-63
248	03_77O_002	NRSC		CH_565	3806	WB	Brahmaputra		China	28	82	80	79	-66
249	03_78E_002	NRSC		BH_57	5110	GL	Brahmaputra	Puna Tsang Chu	Bhutan	18	59	35	40	-69

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
250	03_77O_001	NRSC		CH_564	3879	WB	Brahmaputra		China	49	153	160	159	-69
251	03_91H_025	NRSC		CH_1190	3741	WB	Brahmaputra	Luhit	China	22	85	91	61	-76
252	03_71K_011	NRSC		CH_434	4761	WB	Brahmaputra		China	93	409	399	371	-77
253	03_62O_043	NRSC		CH_388	5285	WB	Brahmaputra		China	9	83	80	73	-89
254	03_62N_003	NRSC		CH_320	5208	WB	Brahmaputra		China	4	-	46	44	-91
255	03_77L_008	NRSC		CH_524	4448	WB	Brahmaputra		China	1	76	80	79	-99

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

- Unobservable (as per NRSC), Ø indicates small rivulet/first order stream

TABLE 5: GL&WBS HAVING WATER SPREAD GREATER THAN 50 HA WITH NO ANALYSIS OF CHANGE IN WATER SPREAD AREA

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
1	03_82F_010	NRSC		CH_735	5030	GL	Brahmaputra		China	17	-	-	-	
2	01_52L_008	NRSC		CH_1	3873	WB	Indus	Satluj	China	#	32	101	78	
3	03_91C_042	NRSC		AP_89	4531	WB	Brahmaputra	Dibang	India	#	-	19	32	
4	03_78I_051	NRSC		BH_132	5074	GL	Brahmaputra	Manas Chu &Mangde Chu	Bhutan	#	112	88	95	
5	01_52H_004	NRSC		HP_5	4155	GL	Indus	Chenab	India	#	-	142	114	
6	03_62O_027	NRSC		CH_372	4575	WB	Brahmaputra		China	#	-	39	35	
7	03_77B_001	NRSC		CH_452	5039	WB	Brahmaputra		China	#	57	43	44	
8	03_91C_045	NRSC		AP_91	3493	WB	Brahmaputra	Dibang	India	#	111	86	96	
9	01_52J_009	NRSC		JK_205	5576	WB	Indus	Shyok	India	#	61	56	51	
10	03_62K_012	NRSC		CH_316	5368	GL	Brahmaputra		China	#	78	85	75	
11	01_43N_030	NRSC		JK_157	3799	WB	Indus	Jhelum	India	#	87	76	77	

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
12	03_62J_032	NRSC		CH_304	4857	GL	Brahmaputra		China	#	89	89	82	
13	01_43E_023	NRSC		JK_47	4155	WB	Indus	Gilgit	India	#	96	83	80	
14	01_43N_001	NRSC		JK_128	4142	WB	Indus	Shingo (Indus)	India	#	131	124	122	
15	01_52K_011	NRSC		JK_219	5291	WB	Indus	Shyok	India	#	183	175	170	
16	02_62K_012	NRSC		NP_30	3653	WB	Ganga	Bheri	Nepal	#	481	494	471	
17	01_52J_006	NRSC		JK_202	5401	WB	Indus	Shyok	India	#	107	104	100	
18	03_77L_003	NRSC		CH_521	4434	WB	Brahmaputra		China	#	4113	4016	4022	
19	03_77L_007	NRSC		CH_523	4510	WB	Brahmaputra		China	#	1582	1380	1402	
20	03_71C_010	NRSC		CH_403	4561	WB	Brahmaputra		China	#	-	54	42	
21	02_72E_001	NRSC		NP_57	1554	WB	Ganga	Baghmati	Nepal	#	165	168	153	
22	02_53P_001	NRSC		UK_9	210	WB	Ganga	Ganga	India	#	1855	1621	1567	
23	02_77D_004	NRSC		CH_259	4378	WB	Ganga	Arun Kosi	China	#	1013	802	740	
24	03_77L_009	NRSC		CH_525	4515	WB	Brahmaputra		China	#	569	584	542	
25	03_77H_007	NRSC		CH_481	4424	WB	Brahmaputra		China	#	823	737	670	
26	03_77P_020	NRSC		CH_591	4649	WB	Brahmaputra	Kuri Chu	China	#	58	45	50	

27	02_71P_018	NRSC		CH_206	4199	WB	Ganga	Arun Kosi	China	#	54	82	64	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
28	02_77D_003	NRSC		CH_258	4364	WB	Ganga	Arun Kosi	China	#	102	82	133	
29	03_62O_028	NRSC		CH_373	4577	WB	Brahmaputra		China	#	902	644	635	
30	03_77L_030	NRSC		BH_12	5305	GL	Brahmaputra		Bhutan	#	89	73	76	
31	03_77P_005	NRSC		CH_576	4619	WB	Brahmaputra		China	#	110	95	97	
32	03_82J_019	NRSC		CH_849	3944	GL	Brahmaputra		China	#	-	64	52	
33	01_52E_001	NRSC		JK_188	5116	GL	Indus	Shyok	India	#	48	4	19	
34	01_52I_004	NRSC		JK_196	5141	WB	Indus	Shyok	India	#	-	63	62	
35	01_61C_004	NRSC			4495	WB				#	-	-	-	
36	01_61G_001	NRSC		CH_62	4973	WB	Indus	Indus	China	#	81	71	71	
37	02_63M_002	NRSC		NP_41	112	WB	Ganga	Rapti	Nepal	#	148	107	119	
38	02_71H_012	NRSC		CH_132	5379	GL	Ganga	Arun Kosi	China	#	-	129	120	
39	03_91C_005	NRSC		CH_1056	4926	GL	Brahmaputra		China	#	-	16	50	
40	03_91C_040	NRSC		AP_87	4450	WB	Brahmaputra	Luhit	India	#	-	71	60	
41	03_91C_052	NRSC		CH_1085	4591	WB	Brahmaputra	Luhit	China	#	-	34	38	
42	03_91C_059	NRSC		CH_1089	4303	WB	Brahmaputra	Dibang	China	#	-	76	72	

43	03_91C_074	NRSC		CH_1102	4258	GL	Brahmaputra	Dibang	China	#	-	17	21	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of June-2023 (ha)	Area of Base Year of 2011 (ha)	Area of Last 5 Years (ha)	Area of Last 10 years (ha)	Max Change in Area (%)
44	03_91D_022	NRSC		AP_118	3143	WB	Brahmaputra	Dibang	India	#	-	36	30	

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

Unobservable (as per NRSC), Ø indicates small rivulet/first order stream, #indicates frozen/ dried lakes

TOABLE 6: GLS INVENTORY PREPARED BY NDMA THROUGH SWISS DEVELOPMENT AGENCY (SDC) FOR INDIAN HIMALAYAN REGION

S.No	Lake_ID	Inventory Developed by	Rank of Vulnera bility	Elevation (m)	Lake Type	State	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
1	98	SDC	High Risk	4103	GL	JK	India	#	2	
2	976	SDC	High Risk/15I	4314	GL	JK	India	#	16.5	
3	173	SDC	Medium Risk	5150	GL	JK	India	#	7	
4	963	SDC	Medium Risk	3725	GL	JK	India	#	26.67	
5	1037	SDC	Medium Risk/27I	3603	GL	JK	India	#	39	
6	2147	SDC	Medium Risk	5688	GL	UK	India	#	0.5	
7	260	SDC	Medium Risk	5253	GL	SK	India	#	39.67	
8	292	SDC	Medium Risk	5577	GL	SK	India	#	3.67	
9	312	SDC	Medium Risk	5137	GL	SK	India	#	8.33	
10	345	SDC	Medium Risk	5108	GL	SK	India	#	18.67	

S.No	Lake_ID	Inventory Developed by	Rank of Vulnera bility	Elevation (m)	Lake Type	State	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
11	515	SDC	Medium Risk	5063	GL	SK	India	#	8	
12	569	SDC	Medium Risk	5450	GL	SK	India	#	32	
13	256	SDC	High risk	4615	GL	SK	India	#	16.33	
14	27	SDC	Very High Risk	3775	GL	JK	India	#	13	
15	180	SDC	Very High Risk	4442	GL	JK	India	#	8.33	
16	182	SDC	Very High Risk	4304	GL	JK	India	#	8.5	
17	931	SDC	Very High Risk	4082	GL	JK	India	#	18.67	
18	938	SDC	Very High Risk	3683	GL	JK	India	#	21	
19	951	SDC	Very High Risk	3762	GL	JK	India	#	18.33	
20	958	SDC	Very High Risk	4103	GL	JK	India	#	3.33	
21	993	SDC	Very High Risk	4148	GL	JK	India	#	9	
22	1014	SDC	Very High Risk	3989	GL	JK	India	#	4.33	
23	1032	SDC	Very High Risk	4007	GL	JK	India	#	1	
24	1360	SDC	Very High Risk	4667	GL	JK	India	#	9	

S.No	Lake_ID	Inventory Developed by	Rank of Vulnera bility	Elevation (m)	Lake Type	State	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
25	1774	SDC	Very High Risk	4593	GL	HP	India	#	7	
26	1805	SDC	Very High Risk/81I	4775	GL	HP	India	#	1.67	
27	1847	SDC	Very High Risk	4570	GL	HP	India	#	12	
28	1936	SDC	Very High Risk/321I	4606	GL	HP	India	#	3	
29	1998	SDC	Very High Risk	3857	GL	HP	India	#	1	
30	2031	SDC	Very High Risk	4702	GL	HP	India	#	12	
31	2108	SDC	Very High Risk/347G	5587	GL	UK	India	#	18	
32	2207	SDC	Very High Risk	4707	GL	UK	India	#	10.33	
33	2299	SDC	Very High Risk	4490	GL	UK	India	#	#	
34	227	SDC	Very High Risk	5176	GL	SK	India	#	53	
35	293	SDC	Very High Risk	5048	GL	SK	India	#	2	
36	295	SDC	Very High Risk	4850	GL	SK	India	#	6	
37	298	SDC	Very High Risk	4508	GL	SK	India	#	4.67	
38	599	SDC	Very High Risk	4251	GL	SK	India	#	8	

S.No	Lake_ID	Inventory Developed by	Rank of Vulnera bility	Elevation (m)	Lake Type	State	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
39	129	SDC	Very High Risk	4895	GL	AP	India	#	9	
40	237	SDC	Very Low Risk	5322	GL	SK	India	#	7	

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

Unobservable (as per NRSC), Ø indicates small rivulet/first order stream, #indicates frozen/ dried lakes

TABLE 7: GLS INVENTORY UPTO 10 HA BUT SMALLER THAN 50 HA PREPARED BY NRSC IN 2009

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
1	02_62F_007	NRSC		GL	5179	Karnal	Ganga	Nepal	22	10.67	106
2	03_91C_023	NRSC		GL	4811	Luhit	Brahmaputra	china	31	16.67	86
3	02_72I_009	NRSC		GL	5292	Sun Kosi	Ganga	Nepal	29	17.33	67
4	03_77K_003	NRSC		GL	5303		Brahmaputra	china	16	10	60
5	02_62J_002	NRSC		GL	5021	Karnal	Ganga	Nepal	17	11.67	46
6	03_71D_003	NRSC		GL	5362		Brahmaputra	china	11	8	38
7	03_82N_016	NRSC		GL	5017		Brahmaputra	china	5	3.67	36
8	03_77L_022	NRSC		GL	4810	Kuri Chu	Brahmaputra	china	13	10	30
9	03_77H_019	NRSC		GL	4804	Puna Tsang Chu	Brahmaputra	Bhutan	10	7.67	30

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
10	03_82F_023	NRSC		GL	4354		Brahmaputra	china	10	8	25
11	03_91C_006	NRSC		GL	5057		Brahmaputra	china	5	4	25
12	03_91G_003	NRSC		GL	5018	Luhit	Brahmaputra	china	25	20	25
13	03_77L_036	NRSC		GL	5810	Kuri Chu	Brahmaputra	china	29	23.33	24
14	03_78A_026	NRSC		GL	4736	Teesta	Brahmaputra	India	14	11.33	24
15	03_77L_020	NRSC		GL	4682	Kuri Chu	Brahmaputra	china	11	9	22
16	03_78E_008	NRSC		GL	5045	Puna Tsang Chu	Brahmaputra	Bhutan	13	10.67	22
17	03_77K_002	NRSC		GL	5154		Brahmaputra	china	45	37.33	21
18	03_82N_015	NRSC		GL	5090		Brahmaputra	china	6	5	20
19	03_78I_028	NRSC		GL	4792	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	24	20	20
20	02_62K_003	NRSC	546G	GL	4571	Karnal	Ganga	Nepal	46	38.67	19

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
21	03_78I_065	NRSC		GL	4668	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	15	12.67	18
22	03_82F_021	NRSC		GL	4487		Brahmaputra	china	9	7.67	17
23	02_62J_001	NRSC		GL	5182	Karnal	Ganga	Nepal	7	6	17
24	03_78I_043	NRSC		GL	5000	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	24	20.67	16
25	03_82F_013	NRSC		GL	4761		Brahmaputra	china	10	8.67	15
26	02_71L_029	NRSC	747G	GL	5237	Arun Kosi	Ganga	china	52	45.33	15
27	03_78A_019	NRSC/SDC	/Very High Risk	GL	4809	Teesta	Brahmaputra	India	13	11.33	15
28	02_71D_001	NRSC		GL	4111	Trisuli	Ganga	Nepal	25	22	14
29	03_78I_014	NRSC		GL	5087	Puna Tsang Chu	Brahmaputra	Bhutan	22	19.33	14

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
30	03_78I_072	NRSC		GL	4788	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	14	12.33	14
31	03_78A_007	NRSC/SDC	/Very High Risk	GL	4977	Teesta	Brahmaputra	India	19	16.67	14
32	03_62J_028	NRSC		GL	5603		Brahmaputra	china	48	42.33	13
33	03_91D_070	NRSC		GL	4126	Luhit	Brahmaputra	china	18	16	13
34	02_71P_031	NRSC	141G	GL	5395	Arun Kosi	Ganga	china	20	17.67	13
35	02_72I_026	NRSC	112G	GL	5188	Sun Kosi	Ganga	Nepal	33	29.33	13
36	02_71H_018	NRSC	123G	GL	4787	Trisuli	Ganga	china	35	31.33	12
37	03_71D_001	NRSC		GL	5454		Brahmaputra	china	19	17	12
38	03_71P_002	NRSC		GL	5537		Brahmaputra	china	16	14.33	12
39	03_82L_004	NRSC		GL	4441		Brahmaputra	china	13	11.67	11
40	01_52L_006	NRSC	306I	GL	5727	Indus	Indus	India	11	10	10

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
41	03_77J_002	NRSC		GL	5254		Brahmaputra	china	11	10	10
42	03_78I_040	NRSC		GL	5167	Puna Tsang Chu	Brahmaputra	Bhutan	22	20	10
43	03_91C_071	NRSC		GL	4339	Dibang	Brahmaputra	china	37	34	9
44	02_71H_014	NRSC		GL	4458	Trisuli	Ganga	china	9	8.33	8
45	03_82L_006	NRSC		GL	4147		Brahmaputra	china	14	13	8
46	02_71L_008	NRSC	457G	GL	5577	Sun Kosi	Ganga	china	38	35.33	8
47	02_71P_044	NRSC	557G	GL	5555	Arun Kosi	Ganga	china	9	8.33	8
48	02_78A_006	NRSC	676G	GL	5743	Arun Kosi	Ganga	china	18	16.67	8
49	03_78A_023	NRSC		GL	4547	Teesta	Brahmaputra	India	31	28.67	8
50	03_78I_067	NRSC		GL	4918	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	23	21.33	8
51	02_62F_009	NRSC	536G	GL	5586	Karnal	Ganga	china	10	9.33	7

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
52	03_71B_001	NRSC		GL	5692		Brahmaputra	china	27	25.33	7
53	03_77J_001	NRSC		GL	5354		Brahmaputra	china	26	24.33	7
54	03_91C_021	NRSC		GL	4093		Brahmaputra	china	32	30	7
55	02_72I_010	NRSC	263G	GL	5125	Sun Kosi	Ganga	Nepal	15	14	7
56	02_78A_007	NRSC	429G	GL	5618	TamurKosi	Ganga	Nepal	16	15	7
57	03_78E_001	NRSC		GL	5157	Puna Tsang Chu	Brahmaputra	Bhutan	31	29	7
58	03_78I_037	NRSC		GL	5159	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	16	15	7
59	03_91C_012	NRSC		GL	4663		Brahmaputra	china	18	17	6
60	02_62G_003	NRSC	589G	GL	3603	Karnal	Ganga	Nepal	35	33	6
61	03_77H_025	NRSC		GL	4312	Puna Tsang Chu	Brahmaputra	Bhutan	25	23.67	6

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
62	03_77L_075	NRSC		GL	4718	Manas Chu &MangdeChu	Brahmaputra	Bhutan	19	18	6
63	02_72M_003	NRSC	823G	GL	5608	Arun Kosi	Ganga	china	19	18	6
64	02_72M_014	NRSC	47G	GL	5217	TamurKosi	Ganga	Nepal	23	21.67	6
65	03_82F_001	NRSC		GL	4822		Brahmaputra	china	15	14.33	5
66	03_82J_006	NRSC		GL	3657		Brahmaputra	china	59	56.33	5
67	03_77L_019	NRSC		GL	5681		Brahmaputra	china	15	14.33	5
68	02_71H_030	NRSC	598G	GL	5411	Sun Kosi	Ganga	china	14	13.33	5
69	02_72I_016	NRSC	739G	GL	5231	Sun Kosi	Ganga	Nepal	30	28.67	5
70	03_78I_022	NRSC		GL	5048	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	15	14.33	5
71	02_71L_005	NRSC	282G	GL	5524	Arun Kosi	Ganga	china	19	18.33	4

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
72	03_83A_004	NRSC		GL	5109	Dangme Chu	Brahmaputra	India	17	16.33	4
73	02_71H_016	NRSC		GL	5305	Arun Kosi	Ganga	china	26	25.33	3
74	03_91G_007	NRSC		GL	4785	Luhit	Brahmaputra	china	12	11.67	3
75	02_71L_007	NRSC	572G	GL	5576	Arun Kosi	Ganga	china	13	12.67	3
76	03_77L_047	NRSC		GL	4364	Puna Tsang Chu	Brahmaputra	Bhutan	44	42.67	3
77	02_72I_001	NRSC	198G	GL	5333	Sun Kosi	Ganga	Nepal	13	12.67	3
78	02_72I_015	NRSC	814G	GL	5416	Sun Kosi	Ganga	Nepal	44	42.67	3
79	03_78I_020	NRSC		GL	5331	Manas Chu &MangdeChu	Brahmaputra	Bhutan	20	19.33	3
80	02_62F_016	NRSC	591G	GL	5359	Karnal	Ganga	Nepal	15	14.67	2
81	01_52A_002	NRSC		GL	4537	Shyok	Indus	India	21	20.67	2
82	03_62O_035	NRSC		GL	5256		Brahmaputra	china	32	31.33	2

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
83	03_82K_109	NRSC		GL	4356		Brahmaputra	china	21	20.67	2
84	02_71L_025	NRSC	154G	GL	5357	Sun Kosi	Ganga	china	19	18.67	2
85	02_71L_009	NRSC	520G	GL	5546	Arun Kosi	Ganga	china	32	31.33	2
86	02_72M_012	NRSC	69G	GL	4932	TamurKosi	Ganga	Nepal	17	16.67	2
87	03_78I_026	NRSC		GL	5233	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	15	14.67	2
88	02_62F_015	NRSC	59G	GL	5359	Karnal	Ganga	china	29	28.67	1
89	03_82J_001	NRSC		GL	4775		Brahmaputra	china	28	27.67	1
90	02_71D_003	NRSC	67G	GL	3668	Trisuli	Ganga	Nepal	26	25.67	1
91	03_91C_019	NRSC		GL	3858		Brahmaputra	china	50	49.67	1
92	03_77L_058	NRSC		GL	5016	Kuri Chu	Brahmaputra		33	32.67	1
93	02_72I_018	NRSC	776G	GL	5370	Sun Kosi	Ganga	Nepal	34	33.67	1
94	02_62F_006	NRSC		GL	5444	Karnal	Ganga	Nepal	15	15	0

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
95	03_77J_005	NRSC		GL	5766		Brahmaputra	china	13	13	0
96	03_82O_002	NRSC		GL	4198		Brahmaputra	china	19	19	0
97	03_91C_015	NRSC		GL	4421		Brahmaputra	china	21	21	0
98	03_91C_016	NRSC		GL	4813		Brahmaputra	china	13	13	0
99	03_91H_001	NRSC		GL	4429	Luhit	Brahmaputra	china	17	17	0
100	02_71L_012	NRSC	96G	GL	5570	Sun Kosi	Ganga	china	21	21	0
101	02_71L_019	NRSC	323G	GL	5378	Sun Kosi	Ganga	china	12	12	0
102	02_71L_027	NRSC	433G	GL	5234	Sun Kosi	Ganga	china	18	18	0
103	02_71P_024	NRSC	576G	GL	5273	Arun Kosi	Ganga	china	22	22	0
104	02_71P_038	NRSC	586G	GL	5483	Arun Kosi	Ganga	china	27	27	0
105	02_77D_005	NRSC	499G	GL	5738	Arun Kosi	Ganga	china	7	7	0
106	03_77H_005	NRSC		GL	5113		Brahmaputra	china	21	21	0

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
107	03_77H_009	NRSC		GL	5150		Brahmaputra	china	15	15	0
108	03_77H_027	NRSC		GL	4927		Brahmaputra	china	22	22	0
109	03_77L_025	NRSC		GL	5370	Kuri Chu	Brahmaputra	china	16	16	0
110	02_72I_019	NRSC	757G	GL	5510	Sun Kosi	Ganga	Nepal	17	17	0
111	02_72M_013	NRSC	518G	GL	5233	Arun Kosi	Ganga	Nepal	12	12	0
112	03_78I_015	NRSC		GL	5116	Puna Tsang Chu	Brahmaputra	Bhutan	15	15	0
113	03_78I_058	NRSC		GL	5041	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	26	26	0
114	03_62K_005	NRSC		GL	4999		Brahmaputra	china	22	22.33	-1
115	03_62K_011	NRSC		GL	5136		Brahmaputra	china	45	45.33	-1
116	02_71H_032	NRSC		GL	5116	Sun Kosi	Ganga	china	25	25.33	-1

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
117	03_77L_039	NRSC		GL	5457	Kuri Chu	Brahmaputra	china	42	42.33	-1
118	02_72I_028	NRSC	146G	GL	4408	Sun Kosi	Ganga	Nepal	25	25.33	-1
119	03_83A_003	NRSC		GL	5188	Dangme Chu	Brahmaputra	India	81	82	-1
120	03_77D_006	NRSC/SDC	/Very High Risk	GL	5084	Teesta	Brahmaputra	India	22	22.33	-1
121	03_82F_012	NRSC		GL	4454		Brahmaputra	china	19	19.33	-2
122	03_82F_024	NRSC		GL	4197		Brahmaputra	china	19	19.33	-2
123	03_82O_001	NRSC		GL	4348		Brahmaputra	china	41	41.67	-2
124	03_82G_004	NRSC		GL	4498		Brahmaputra	china	30	30.67	-2
125	02_71L_017	NRSC	179G	GL	5211	Sun Kosi	Ganga	china	13	13.33	-2
126	03_77H_022	NRSC		GL	4936		Brahmaputra	china	19	19.33	-2

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
127	03_77L_074	NRSC		GL	5324	Manas Chu &MangdeChu	Brahmaputra	Bhutan	17	17.33	-2
128	02_72I_024	NRSC	358G	GL	5165	Sun Kosi	Ganga	Nepal	28	28.67	-2
129	02_72I_031	NRSC	14G	GL	4777	Sun Kosi	Ganga	Nepal	27	27.67	-2
130	02_72I_012	NRSC	113G	GL	4409	Sun Kosi	Ganga	Nepal	40	40.67	-2
131	02_71P_048	NRSC	283G	GL	5094	Arun Kosi	Ganga	china	18	18.33	-2
132	02_72M_008	NRSC	376G	GL	4722	TamurKosi	Ganga	Nepal	37	37.67	-2
133	02_72M_015	NRSC	115G	GL	4969	TamurKosi	Ganga	Nepal	13	13.33	-2
134	03_78A_027	NRSC/SDC	/Very High Risk	GL	4888	Teesta	Brahmaputra	India	30	30.67	-2
135	01_52C_002	NRSC	46I	GL	4092	Chenab	Indus	India	42	43.33	-3
136	02_71H_009	NRSC		GL	5448	Arun Kosi	Ganga	china	22	22.67	-3
137	03_91C_043	NRSC		GL	4429		Brahmaputra	china	10	10.33	-3

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
138	03_77H_024	NRSC		GL	4369	Puna Tsang Chu	Brahmaputra	Bhutan	45	46.33	-3
139	03_77L_034	NRSC		GL	5500	Kuri Chu	Brahmaputra	china	21	21.67	-3
140	03_77L_048	NRSC		GL	4792	Kuri Chu	Brahmaputra	china	25	25.67	-3
141	02_78A_008	NRSC	199G	GL	5032	TamurKosi	Ganga	Nepal	24	24.67	-3
142	03_78A_016	NRSC		GL	5451	Teesta	Brahmaputra	India	11	11.33	-3
143	02_62P_001	NRSC	258G	GL	4472	Bheri	Ganga	Nepal	43	45	-4
144	02_71H_020	NRSC		GL	5354	Arun Kosi	Ganga	china	70	72.67	-4
145	02_71H_023	NRSC		GL	5595	Arun Kosi	Ganga	china	57	59.33	-4
146	02_71P_036	NRSC	54G	GL	5121	Arun Kosi	Ganga	china	36	37.67	-4
147	02_71P_039	NRSC	396G	GL	5489	Arun Kosi	Ganga	china	18	18.67	-4
148	02_72I_013	NRSC	694G	GL	5497	Sun Kosi	Ganga	Nepal	17	17.67	-4
149	02_77D_010	NRSC	590G	GL	5127	Arun Kosi	Ganga	china	36	37.33	-4

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
150	03_78I_038	NRSC		GL	5143	Puna Tsang Chu	Brahmaputra	Bhutan	9	9.33	-4
151	03_78E_027	NRSC		GL	4808	Puna Tsang Chu	Brahmaputra	Bhutan	18	18.67	-4
152	03_78I_019	NRSC		GL	5224	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	23	24	-4
153	01_52H_003	NRSC		GL	4165	Chenab	Indus	India	153	160.67	-5
154	02_62K_001	NRSC	329G	GL	4404	Karnal	Ganga	Nepal	27	28.33	-5
155	03_82C_011	NRSC		GL	5242		Brahmaputra	china	14	14.67	-5
156	02_71H_024	NRSC	155G	GL	4890	Trisuli	Ganga	china	25	26.33	-5
157	02_71P_026	NRSC	322G	GL	5340	Arun Kosi	Ganga	china	13	13.67	-5
158	03_77L_028	NRSC		GL	4632	Kuri Chu	Brahmaputra	china	12	12.67	-5
159	03_78I_064	NRSC		GL	4976	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	19	20	-5

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
160	02_62O_002	NRSC	410G	GL	5495	Kali Gandak	Ganga	Nepal	20	21.33	-6
161	03_62K_013	NRSC		GL	5101		Brahmaputra	china	44	47	-6
162	02_71L_014	NRSC	240G	GL	5364	Sun Kosi	Ganga	china	15	16	-6
163	02_71L_015	NRSC	284G	GL	5261	Sun Kosi	Ganga	china	21	22.33	-6
164	02_71L_020	NRSC	156G	GL	5348	Sun Kosi	Ganga	china	26	27.67	-6
165	02_71P_041	NRSC	768G	GL	5064	Arun Kosi	Ganga	china	17	18	-6
166	03_78A_031	NRSC		GL	4305	Teesta	Brahmaputra	India	11	11.67	-6
167	02_53N_001	NRSC	250G	GL	4688	Ganga	Ganga	India	21	22.67	-7
168	03_82F_009	NRSC		GL	4712		Brahmaputra	china	22	23.67	-7
169	02_71H_004	NRSC		GL	5239	Arun Kosi	Ganga	china	23	24.67	-7
170	03_77L_023	NRSC		GL	5489	Kuri Chu	Brahmaputra	china	28	30	-7
171	02_71H_022	NRSC		GL	5735	Arun Kosi	Ganga	china	18	19.33	-7

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
172	02_71P_042	NRSC	654G	GL	5524	Arun Kosi	Ganga	china	19	20.33	-7
173	03_77H_015	NRSC		GL	4801		Brahmaputra	china	13	14	-7
174	03_77L_062	NRSC		GL	5295	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	44	47.33	-7
175	02_71L_031	NRSC	52G	GL	4682	Sun Kosi	Ganga	china	28	30	-7
176	02_72M_004	NRSC	336G	GL	5293	Arun Kosi	Ganga	china	48	51.67	-7
177	03_78A_010	NRSC		GL	5078	Teesta	Brahmaputra	India	31	33.33	-7
178	03_78E_011	NRSC		GL	4952	Puna Tsang Chu	Brahmaputra	Bhutan	18	19.33	-7
179	03_77D_007	NRSC/SDC	/Very High Risk	GL	5015	Teesta	Brahmaputra	India	23	24.67	-7
180	01_52C_001	NRSC	11I	GL	4394	Shingo (Indus)	Indus	India	51	55.33	-8
181	01_62F_007	NRSC		GL	5344	Satluj	Indus	china	20	21.67	-8

S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
182	02_71H_005	NRSC		GL	5010	Arun Kosi	Ganga	china	69	75	-8
183	03_82G_003	NRSC		GL	4936		Brahmaputra	china	16	17.33	-8
184	02_71L_024	NRSC	245G	GL	5263	Sun Kosi	Ganga	china	24	26	-8
185	03_77L_061	NRSC		GL	5038	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	16	17.33	-8
186	03_78I_005	NRSC		GL	5338	Puna Tsang Chu	Brahmaputra	Bhutan	41	44.67	-8
187	02_72I_020	NRSC	763G	GL	5436	Sun Kosi	Ganga	Nepal	19	20.67	-8
188	02_77D_011	NRSC	393G	GL	5305	Arun Kosi	Ganga	china	42	45.67	-8
189	03_83A_005	NRSC		GL	4994	Dangme Chu	Brahmaputra	India	11	12	-8
190	03_82F_005	NRSC		GL	4762		Brahmaputra	china	40	44	-9
191	02_72I_006	NRSC		GL	4741	Sun Kosi	Ganga	Nepal	16	17.67	-9
S.No	Lake_ID		Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of	Base Area	Max Change

		Inventory Developed by							June-2023 (ha)	(Avg area of year 2022) (ha)	in Area (%)
192	03_62J_025	NRSC		GL	5362		Brahmaputra	china	19	21	-10
193	03_82F_026	NRSC		GL	4607		Brahmaputra	china	9	10	-10
194	03_82L_008	NRSC		GL	4342		Brahmaputra	china	9	10	-10
195	03_91H_006	NRSC		GL	4620	Luhit	Brahmaputra	china	15	16.67	-10
196	03_77H_026	NRSC		GL	5233		Brahmaputra	china	9	10	-10
197	03_77L_038	NRSC		GL	5521		Brahmaputra	china	12	13.33	-10
198	03_77L_057	NRSC		GL	4897	Kuri Chu	Brahmaputra		40	44.33	-10
199	02_72M_001	NRSC	737G	GL	5675	Arun Kosi	Ganga	china	6	6.67	-10
200	03_78I_025	NRSC		GL	5194	Puna Tsang Chu	Brahmaputra	Bhutan	12	13.33	-10
201	03_78A_002	NRSC/SDC	/Very High Risk	GL	4952	Teesta	Brahmaputra	India	36	40	-10
202	03_62O_031	NRSC		GL	5381		Brahmaputra	china	28	31.33	-11
S.No	Lake_ID		Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of	Base Area	Max Change

		Inventory Developed by							June-2023 (ha)	(Avg area of year 2022) (ha)	in Area (%)
203	03_71C_004	NRSC		GL	5575		Brahmaputra	china	11	12.33	-11
204	03_91H_036	NRSC		GL	4457	Luhit	Brahmaputra	china	19	21.33	-11
205	02_71L_018	NRSC	651G	GL	5377	Sun Kosi	Ganga	china	13	14.67	-11
206	02_71L_022	NRSC	715G	GL	5554	Arun Kosi	Ganga	china	24	27	-11
207	02_71P_023	NRSC	124G	GL	5235	Arun Kosi	Ganga	china	17	19	-11
208	03_77L_078	NRSC		GL	5296	Puna Tsang Chu	Brahmaputra	Bhutan	13	14.67	-11
209	03_77L_079	NRSC		GL	5386	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	31	35	-11
210	02_71L_030	NRSC	242G	GL	5242	Sun Kosi	Ganga	china	19	21.33	-11
211	02_72I_021	NRSC	764G	GL	5276	Sun Kosi	Ganga	Nepal	18	20.33	-11
212	02_71P_046	NRSC	317G	GL	4898	Arun Kosi	Ganga	china	25	28	-11
S.No	Lake_ID	Inventory	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-	Base Area (Avg	Max Change in Area

		Developed by							2023 (ha)	area of year 2022) (ha)	(%)
213	03_83A_007	NRSC		GL	5028	Jia Brali	Brahmaputra	India	14	15.67	-11
214	03_78E_025	NRSC		GL	4341	Puna Tsang Chu	Brahmaputra	Bhutan	13	14.67	-11
215	02_62F_011	NRSC	362G	GL	5524	Karnal	Ganga	china	23	26	-12
216	03_62J_027	NRSC		GL	4781		Brahmaputra	china	20	22.67	-12
217	02_71H_010	NRSC		GL	5481	Arun Kosi	Ganga	china	22	25	-12
218	02_71H_031	NRSC	78G	GL	5268	Sun Kosi	Ganga	china	24	27.33	-12
219	02_71L_021	NRSC	438G	GL	5373	Sun Kosi	Ganga	china	15	17	-12
220	03_77H_029	NRSC		GL	5049	Puna Tsang Chu	Brahmaputra	Bhutan	19	21.67	-12
221	03_78I_009	NRSC		GL	5108	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	23	26	-12
222	02_72I_022	NRSC	287G	GL	5344	Sun Kosi	Ganga	Nepal	27	30.67	-12
223	02_62F_010	NRSC		GL	5502	Karnal	Ganga	Nepal	9	10.33	-13
S.No	Lake_ID	Inventory	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-	Base Area (Avg	Max Change in Area

		Developed by							2023 (ha)	area of year 2022) (ha)	(%)
224	01_62J_004	NRSC	446I	GL	5504	Satluj	Indus	china	9	10.33	-13
225	02_71H_006	NRSC		GL	5167	Arun Kosi	Ganga	china	30	34.67	-13
226	03_78I_008	NRSC		GL	5252	Manas Chu &MangdeChu	Brahmaputra	Bhutan	11	12.67	-13
227	03_78A_020	NRSC		GL	5219	Teesta	Brahmaputra	India	13	15	-13
228	03_78I_057	NRSC		GL	5060	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	39	44.67	-13
229	03_62K_007	NRSC		GL	4911		Brahmaputra	china	25	29	-14
230	03_62K_008	NRSC		GL	4968		Brahmaputra	china	38	44.33	-14
231	03_91G_004	NRSC		GL	5262	Luhit	Brahmaputra	china	26	30.33	-14
232	03_77H_010	NRSC		GL	5518		Brahmaputra	china	12	14	-14
233	03_77L_045	NRSC		GL	5224	Kuri Chu	Brahmaputra	china	28	32.67	-14
S.No	Lake_ID	Inventory Developed	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023	Base Area (Avg area of	Max Change in Area (%)

		by							(ha)	year 2022) (ha)	
234	03_77L_071	NRSC		GL	5228	Puna Tsang Chu	Brahmaputra	Bhutan	18	21	-14
235	02_72I_008	NRSC	99G	GL	5040	Sun Kosi	Ganga		31	36	-14
236	03_78I_046	NRSC		GL	5168	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	19	22	-14
237	03_62J_024	NRSC		GL	5548		Brahmaputra	china	17	20	-15
238	02_62O_005	NRSC	609G	GL	5450	Kali Gandak	Ganga	Nepal	11	13	-15
239	03_62K_010	NRSC		GL	5181		Brahmaputra	china	58	68.33	-15
240	03_83A_001	NRSC		GL	5018		Brahmaputra	china	40	47.33	-15
241	02_71P_001	NRSC		GL	5498	Arun Kosi	Ganga	china	15	18	-17
242	03_77L_082	NRSC		GL	5019	Puna Tsang Chu	Brahmaputra	Bhutan	11	13.33	-17
243	03_62J_010	NRSC		GL	5571		Brahmaputra	china	20	24.33	-18
S.No	Lake_ID	Inventory Developed	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023	Base Area (Avg area of	Max Change in Area (%)

		by							(ha)	year 2022) (ha)	
244	03_91C_004	NRSC		GL	4137		Brahmaputra	china	15	18.33	-18
245	03_91H_033	NRSC		GL	4389	Luhit	Brahmaputra	china	9	11	-18
246	03_78I_001	NRSC		GL	5129	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	6	7.33	-18
247	03_71D_002	NRSC		GL	5574		Brahmaputra	china	29	35.67	-19
248	03_91G_006	NRSC		GL	5028	Luhit	Brahmaputra	china	18	22.33	-19
249	03_77H_016	NRSC		GL	4929		Brahmaputra	china	33	40.67	-19
250	03_78I_011	NRSC		GL	5239	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	18	22.33	-19
251	03_91H_034	NRSC		GL	4629	Luhit	Brahmaputra	china	11	13.67	-20
252	02_71P_032	NRSC	564G	GL	5190	Arun Kosi	Ganga	china	15	18.67	-20
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022)	Max Change in Area (%)

										(ha)	
253	03_78I_054	NRSC		GL	5138	Manas Chu &MangdeChu	Brahmaputra	Bhutan	12	15	-20
254	02_62G_002	NRSC	599G	GL	4822	Karnal	Ganga	Nepal	15	19	-21
255	03_77L_049	NRSC		GL	4716	Puna Tsang Chu	Brahmaputra	Bhutan	27	34	-21
256	03_71C_001	NRSC		GL	5543		Brahmaputra	china	6	7.67	-22
257	02_71P_034	NRSC	726G	GL	5259	Arun Kosi	Ganga	china	18	23	-22
258	03_77H_032	NRSC		GL	5056		Brahmaputra	china	7	9	-22
259	03_78A_030	NRSC		GL	4447	Amo Chu	Brahmaputra		12	15.33	-22
260	03_82N_008	NRSC		GL	4546		Brahmaputra	china	26	34.33	-24
261	03_77L_031	NRSC		GL	4698	Kuri Chu	Brahmaputra	china	14	18.33	-24
262	02_62F_014	NRSC	236G	GL	5481	Karnal	Ganga	china	5	6.67	-25
263	03_62J_003	NRSC		GL	5553		Brahmaputra	china	8	10.67	-25
S.No	Lake_ID	Inventory Developed	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023	Base Area (Avg area of	Max Change in Area (%)

		by							(ha)	year 2022) (ha)	
264	03_82N_025	NRSC		GL	4764		Brahmaputra	china	18	24	-25
265	02_71D_002	NRSC		GL	4063	Trisuli	Ganga	Nepal	4	5.33	-25
266	03_91H_003	NRSC		GL	4439	Luhit	Brahmaputra	china	10	13.33	-25
267	02_71P_030	NRSC	166G	GL	5329	Arun Kosi	Ganga	china	16	21.33	-25
268	03_77L_073	NRSC		GL	5166	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	9	12	-25
269	03_78I_006	NRSC		GL	5158	Puna Tsang Chu	Brahmaputra	Bhutan	16	21.33	-25
270	03_78I_004	NRSC		GL	5194	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	20	26.67	-25
271	02_71H_025	NRSC	464G	GL	5303	Trisuli	Ganga	china	14	19	-26
272	03_62J_004	NRSC		GL	5556		Brahmaputra	china	11	15	-27
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

273	03_77L_065	NRSC		GL	5025	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	11	15	-27
274	02_71L_033	NRSC	408G	GL	5369	Sun Kosi	Ganga	Nepal	11	15	-27
275	03_78E_003	NRSC		GL	5152	Puna Tsang Chu	Brahmaputra	Bhutan	16	22	-27
276	02_62F_008	NRSC		GL	5620	Karnal	Ganga	Nepal	6	8.33	-28
277	03_62J_009	NRSC		GL	5624		Brahmaputra	china	17	23.67	-28
278	03_82F_025	NRSC		GL	4253		Brahmaputra	china	6	8.33	-28
279	02_71H_034	NRSC	320G	GL	4745	Trisuli	Ganga	Nepal	12	16.67	-28
280	02_72I_017	NRSC	49G	GL	5018	Sun Kosi	Ganga	Nepal	6	8.33	-28
281	03_77H_017	NRSC		GL	4537	Puna Tsang Chu	Brahmaputra	Bhutan	18	25.33	-29
282	03_77L_056	NRSC		GL	4963	Kuri Chu	Brahmaputra	china	10	14	-29
283	01_52A_003	NRSC		GL	4586	Shyok	Indus	India	15	21.33	-30
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

284	02_71L_035	NRSC	657G	GL	5091	Sun Kosi	Ganga	Nepal	9	13	-31
285	02_62F_013	NRSC	256G	GL	5252	Karnal	Ganga	china	30	45	-33
286	03_82N_011	NRSC		GL	4997		Brahmaputra	china	14	21	-33
287	02_78A_001	NRSC	498G	GL	5201	Arun Kosi	Ganga	china	15	22.33	-33
288	03_78I_036	NRSC		GL	5028	Puna Tsang Chu	Brahmaputra	Bhutan	8	12	-33
289	03_78E_016	NRSC		GL	5004		Brahmaputra	china	11	16.67	-34
290	02_62B_005	NRSC	580G	GL	4314	Sarda	Ganga	India	5	8	-38
291	02_71H_036	NRSC	195G	GL	5024	Trisuli	Ganga	Nepal	8	13.33	-40
292	02_78A_002	NRSC	668G	GL	5397	Arun Kosi	Ganga	china	8	13.33	-40
293	01_62B_002	NRSC	381I	GL	4998	Satluj	Indus	china	11	19.33	-43
294	03_78A_004	NRSC		GL	5456		Brahmaputra	china	13	23.33	-44
295	03_78A_006	NRSC		GL	5004	Teesta	Brahmaputra	India	8	14.33	-44
296	01_53M_002	NRSC	142I	GL	5468	Indus	Indus	china	4	7.33	-45
297	02_62K_011	NRSC	612G	GL	4673	Bheri	Ganga	Nepal	15	29	-48
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

298	03_78A_015	NRSC/SDC	/Medium Risk	GL	4970	Teesta	Brahmaputra	India	5	9.67	-48
299	03_78A_012	NRSC		GL	5130	Teesta	Brahmaputra	India	14	29.33	-52
300	03_91G_009	NRSC		GL	4637	Luhit	Brahmaputra	china	8	17.33	-54
301	02_71P_033	NRSC		GL	4888	Arun Kosi	Ganga	china	9	19.67	-54
302	03_78A_035	NRSC		GL	4998	Teesta	Brahmaputra	India	4	8.67	-54
303	03_78A_011	NRSC		GL	5168	Amo Chu	Brahmaputra	china	7	16	-56
304	03_78A_008	NRSC		GL	4998	Teesta	Brahmaputra	India	8	18.67	-57
305	02_62B_004	NRSC	232G	GL	4918	Sarda	Ganga	India	9	21.33	-58
306	03_71P_003	NRSC		GL	5360		Brahmaputra	china	12	28.33	-58
307	03_62J_020	NRSC		GL	5603		Brahmaputra	china	6	14.67	-59
308	02_62O_004	NRSC	299G	GL	5529	Kali Gandak	Ganga	Nepal	8	20.33	-61
309	03_78A_005	NRSC		GL	5201	Teesta	Brahmaputra	India	5	12.67	-61
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

310	03_71C_002	NRSC		GL	5663		Brahmaputra	china	3	9	-67
311	03_82J_003	NRSC		GL	4161		Brahmaputra	china	7	23.33	-70
312	03_77H_021	NRSC		GL	5135	Puna Tsang Chu	Brahmaputra	Bhutan	4	13.33	-70
313	03_71C_006	NRSC		GL	5482		Brahmaputra	china	5	19	-74
314	03_82L_007	NRSC		GL	4163	Ding	Brahmaputra	India	4	15.67	-74
315	01_62F_009	NRSC	387I	GL	5712	Satluj	Indus	china	3	20.33	-85
316	02_71P_017	NRSC		GL	4194	Arun Kosi	Ganga	china	9	60	-85
317	02_72I_030	NRSC	480G	GL	4624	Sun Kosi	Ganga	Nepal	1	7.67	-87
318	03_71P_004	NRSC		GL	5637		Brahmaputra	china	1	10.67	-91
319	01_53M_003	NRSC	110I	GL	5511	Indus	Indus	china	7	#	
320	03_82F_011	NRSC		GL	4720		Brahmaputra	china	7	#	
321	03_82O_004	NRSC		GL	4148		Brahmaputra	china	15	#	
322	02_62B_006	NRSC	495G	GL	5106	Karnal	Ganga	china	#	42	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

323	02_62B_007	NRSC		GL	4839	Sarda	Ganga	India	#	0	
324	01_42H_002	NRSC	162I	GL	2763	Gilgit	Indus	India	#	16	
325	01_43J_003	NRSC		GL	3954	Jhelum	Indus	India	#	13.67	
326	01_52B_012	NRSC	129I	GL	5137	Indus	Indus	India	#	14.5	
327	01_52L_007	NRSC	184I	GL	5498	Indus	Indus	India	#	33	
328	01_52P_004	NRSC		GL	5470	Indus	Indus	china	#	0	
329	01_53M_001	NRSC	33I	GL	5576	Indus	Indus	china	#	18.5	
330	01_61B_002	NRSC	345I	GL	5722	Indus	Indus	china	#	26	
331	01_62B_003	NRSC	86I	GL	5288	Satluj	Indus	India	#	12.5	
332	01_62E_007	NRSC	437I	GL	5641	Satluj	Indus	china	#	13.5	
333	01_62E_016	NRSC	270I	GL	5528	Satluj	Indus	china	#	20	
334	03_82F_018	NRSC		GL	4554		Brahmaputra	china	#	17	
335	03_82N_001	NRSC		GL	5055		Brahmaputra	china	#	34.33	
336	03_82N_018	NRSC		GL	4333		Brahmaputra	china	#	10	
337	03_82N_029	NRSC		GL	4492		Brahmaputra	china	#	42.5	
338	03_82N_031	NRSC		GL	4409		Brahmaputra	china	#	16	
339	03_82N_032	NRSC		GL	4384		Brahmaputra	china	#	41	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

340	03_82N_034	NRSC		GL	4181		Brahmaputra	china	#	14.5	
341	03_82N_035	NRSC		GL	4479		Brahmaputra	china	#	20.5	
342	03_82N_037	NRSC		GL	4691		Brahmaputra	china	#	11	
343	03_82O_003	NRSC		GL	4180		Brahmaputra	china	#	15	
344	03_91C_002	NRSC		GL	4691		Brahmaputra	china	#	33.5	
345	03_91C_003	NRSC		GL	4703		Brahmaputra	china	#	31	
346	03_91C_007	NRSC		GL	4817		Brahmaputra	china	#	10	
347	03_91C_008	NRSC		GL	4899		Brahmaputra	china	#	20.5	
348	03_91C_010	NRSC		GL	4712		Brahmaputra	china	#	21	
349	03_91C_013	NRSC		GL	4925		Brahmaputra	china	#	0	
350	03_91G_001	NRSC		GL	5147		Brahmaputra	china	#	9	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

351	01_52A_004	NRSC/SDC	/Very High Risk	GL	4619	Shyok	Indus	India	#	10	
352	01_52B_010	NRSC/SDC	75I/Medium Risk	GL	5122	Indus	Indus	India	#	16.5	
353	01_53I_002	NRSC/SDC	26I/Very High Risk	GL	4273	Satluj	Indus	India	#	30	
354	02_62K_006	NRSC	70G	GL	5053	Karnal	Ganga	Nepal	#	30	
355	02_71H_011	NRSC	775G	GL	4509	Trisuli	Ganga	china	#	28.5	
356	02_71H_013	NRSC	172G	GL	4446	Trisuli	Ganga	china	#	16.5	
357	02_71H_019	NRSC	92G	GL	4674	Trisuli	Ganga	china	#	15	
358	03_62K_006	NRSC		GL	5101		Brahmaputra	china	#	25.5	
359	03_62O_045	NRSC		GL	5566		Brahmaputra	china	#	9.5	
360	03_82G_007	NRSC		GL	4994		Brahmaputra	china	#	11	
361	03_91C_026	NRSC		GL	4305	Dibang	Brahmaputra	India	#	24.5	
362	03_91C_035	NRSC		GL	4283		Brahmaputra	china	#	55	
363	03_91C_036	NRSC		GL	4298		Brahmaputra	china	#	0	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

364	03_91D_075	NRSC		GL	4274	Dibang	Brahmaputra	India	#	21	
365	03_91D_082	NRSC		GL	4550	Luhit	Brahmaputra	china	#	34.67	
366	03_91D_096	NRSC		GL	3794	Luhit	Brahmaputra	china	#	0	
367	03_91D_098	NRSC		GL	4197	Luhit	Brahmaputra	china	#	11.5	
368	03_91D_099	NRSC		GL	4406	Luhit	Brahmaputra	china	#	26.5	
369	03_91G_005	NRSC		GL	5170	Luhit	Brahmaputra	china	#	10.5	
370	03_91H_007	NRSC		GL	4635	Luhit	Brahmaputra	china	#	31.5	
371	03_91H_008	NRSC		GL	4755	Luhit	Brahmaputra	china	#	46	
372	03_91H_015	NRSC		GL	4553	Luhit	Brahmaputra	china	#	10	
373	03_91H_073	NRSC		GL	4481	Luhit	Brahmaputra	India	#	#	
374	02_71L_016	NRSC	570G	GL	5345	Sun Kosi	Ganga	china	#	9.5	
375	02_71P_020	NRSC		GL	4200	Arun Kosi	Ganga	china	#	118.5	
S.No	Lake_ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation (m)	River	Basin	Country	Area of June-2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)

376	03_77L_053	NRSC		GL	4793	Kuri Chu	Brahmaputra	china	#	27	
377	03_77L_040	NRSC		GL	4515	Puna Tsang Chu	Brahmaputra	Bhutan	#	0	
378	03_77L_054	NRSC		GL	4717	Puna Tsang Chu	Brahmaputra	Bhutan	#	2	
379	03_77L_063	NRSC		GL	5183	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	#	18	
380	02_72I_005	NRSC	483G	GL	4715	Sun Kosi	Ganga	Nepal	#	24.5	
381	02_72M_011	NRSC	86G	GL	4865	Arun Kosi	Ganga	Nepal	#	42.5	
382	03_78E_018	NRSC		GL	5164		Brahmaputra	china	#	18.5	
383	03_78A_017	NRSC		GL	5545	Teesta	Brahmaputra	India	#	27.5	
384	03_78A_025	NRSC		GL	4888	Amo Chu	Brahmaputra		#	9.5	
385	03_78M_013	NRSC		GL	4232	Kuri Chu	Brahmaputra	Bhutan	#	5.5	

G stands for Ganga, I for Indus and B for Brahmaputra under the rank of vulnerability

Unobservable (as per NRSC), Ø indicates small rivulet/first order stream, #indicates frozen/ dried lakes