



Monthly Monitoring Report
of
Glacial Lakes & Water Bodies in the
Himalayan Region of Indian River Basins
(July, 2023)

Morphology & Climate Change Directorate
Central Water Commission
Department of Water Resources, River Development &
Ganga Rejuvenation



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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 July, 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 Flood (GLOF) 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 July, 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 14774 satellite images in the month of July, 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, 24 GL&WBs have shown increase in water spread area greater than 40%, 144 GL&WBs have shown increase in water spread area less than 40%, 20 GL&WBs have shown no change in water spread area, 262 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 month of July 2023 was compared with the average area of GL for the year 2022(average of July to October 2022). Out of these, 144 GL have shown an increase in water spread area, 35 GL have shown no change in water spread area, 207 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 break-up of Glacial Lakes and Water Bodies is shown in Figure 1.

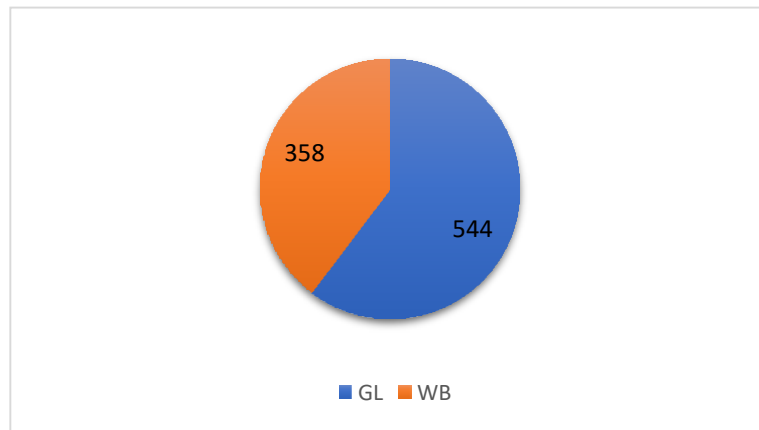


FIGURE 1: LAKE TYPE DISTRIBUTION

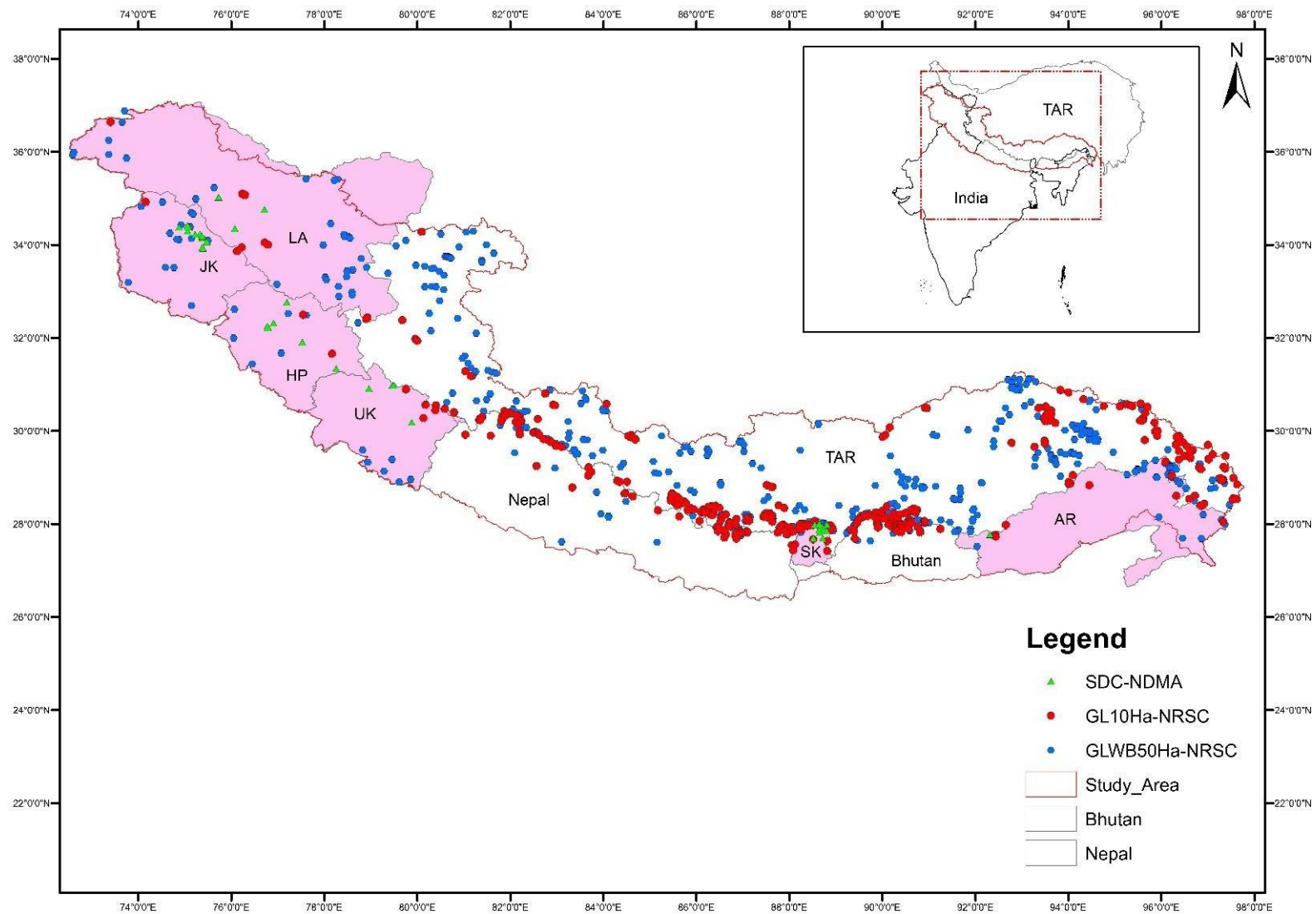


FIGURE 2: LOCATIONS OF GLACIAL LAKES & WATER BODIES IN THE STUDY AREA

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-1 SAR (Micro)

It has C-band synthetic aperture radar (SAR) active sensor which 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 numbers of satellite images processed for the month of July- 2023 were 14774. Of these, 9205 were Multispectral images and 5569 were Microwave images as shown in Figure 3.

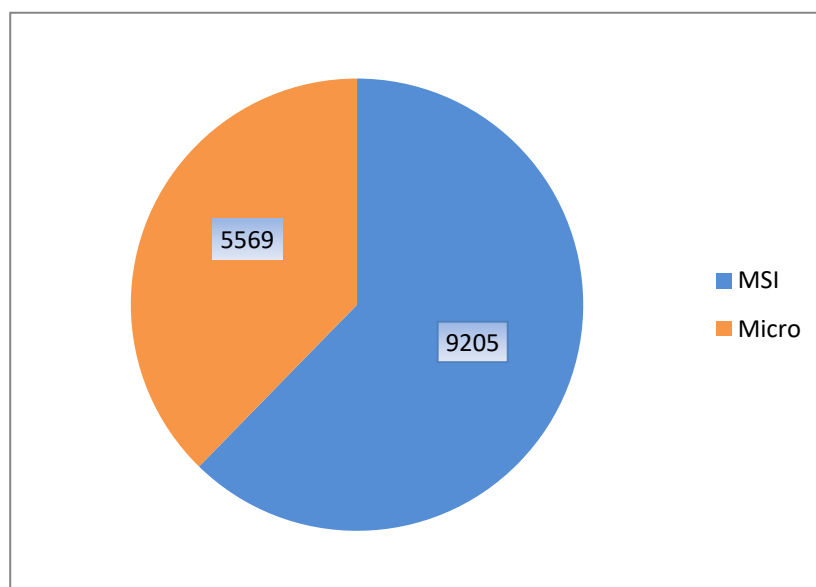


FIGURE 3: ANALYSED SATELLITE IMAGES DISTRIBUTION

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 GL&WBs are required to be 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 minimum 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.

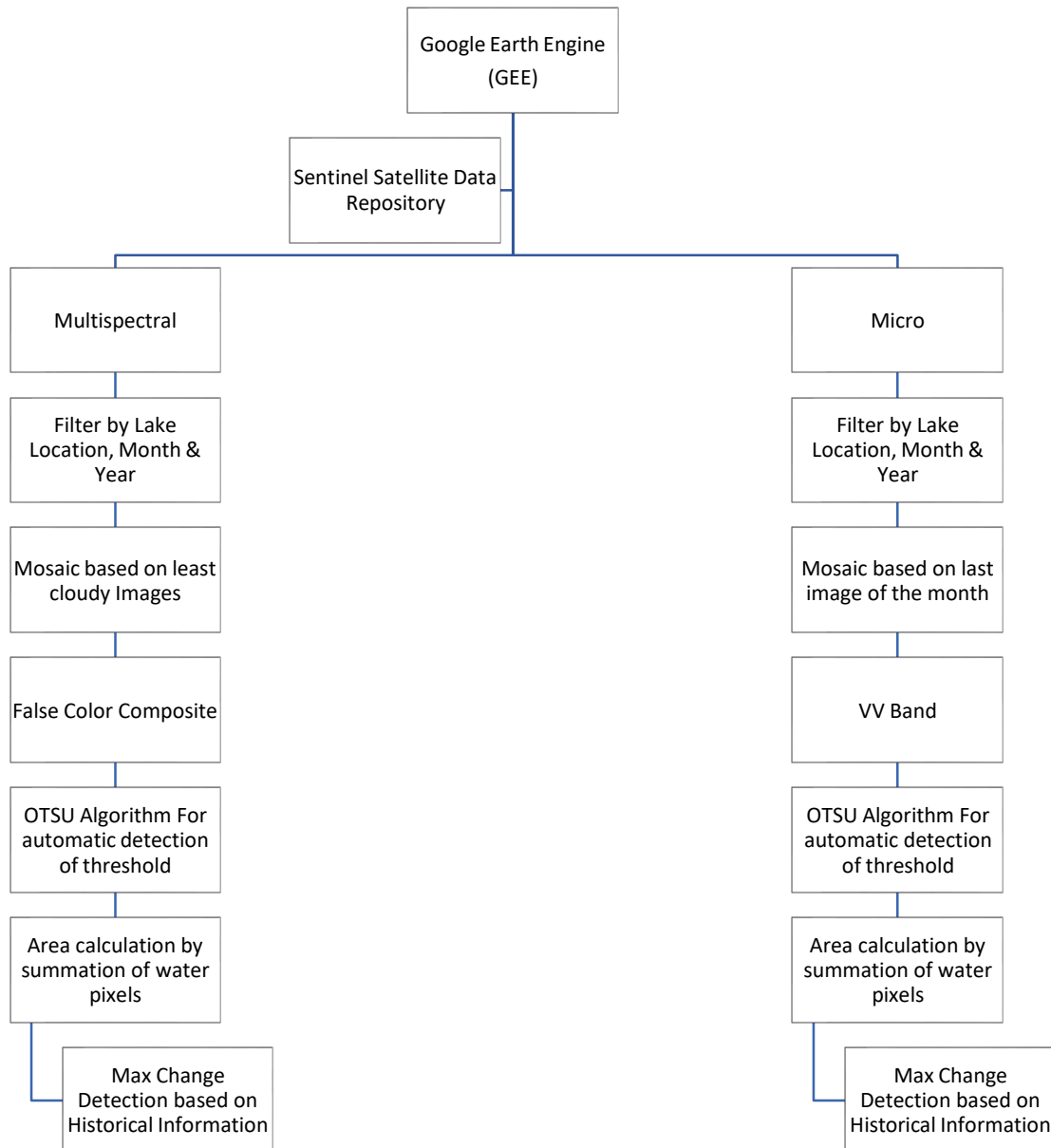


FIGURE 4: METHODOLOGY OF AUTOMATIC MONITORING OF GLACIAL LAKES & WATER BODIES USING SATELLITE IMAGES

4. Results

The water spread area of 902 Glacial Lakes & Water Bodies was calculated for the month of July 2023 in an automatic manner and manually digitized wherever required using the methodology described above. It includes 477 GL&WBs having size greater than 50ha 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 July, 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 July, 2023 and the change detection with respect to average area of the year 2022(July 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, 24 GL&WBs have shown increase in water spread area greater than 40%, 144 GL&WBs have shown increase in water spread area but less than 40%, 20 GL&WBs have shown no change in water spread area, 262 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, 144 GL have shown an increase in water spread area, 35 GL have shown no change in water spread area, 207 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.

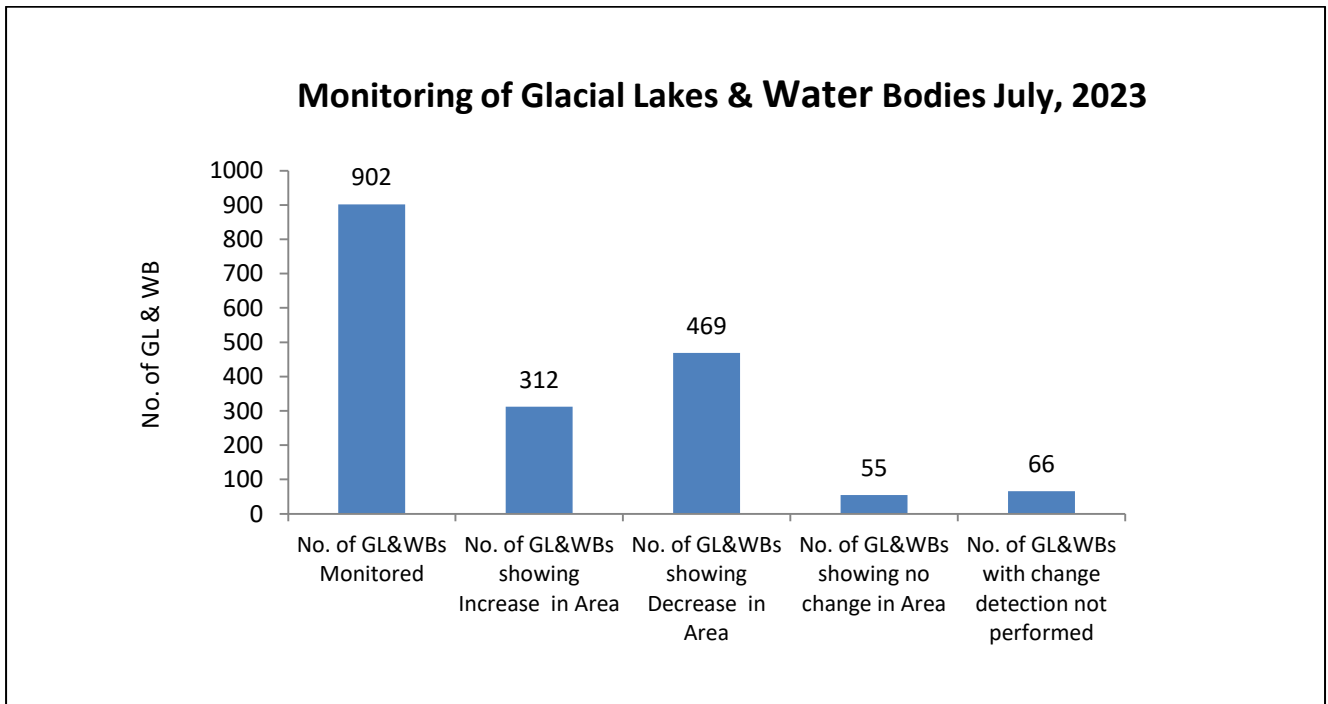


FIGURE 5: OVERALL CHANGES IN WATER SPREAD AREA OF GL&WBs FOR JULY, 2023

5. Conclusions

- 4 Glacial Lakes and 20 Water Bodies of size greater than 50 ha are required **to be vigorously monitored for disaster purpose**. These Glacial lakes/water bodies have shown increase in water spread area greater than 40%. The 4 Glacial lakes and 15 Water Bodies are in China, 2 Water Bodies in Bhutan and 3 Water Bodies in India. The Water Bodies in India are located in Arunachal Pradesh. The details of these Glacial lake/ water bodies have been highlighted in Table 1.
- 44 Glacial Lakes of size greater than 50 ha have shown marginal increase in water spread area ranging from 1 to 40%, while 9 Glacial Lakes of size greater than 50 ha have shown no change and 51 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 14774 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 at shorter 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 to 10m 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)

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July- 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_91H_017	NRSC		CH_1182	4590	WB	Brahmaputra	Luhit	China	45	-	14	18	150
2	03_82O_047	NRSC		CH_1039	3574	WB	Brahmaputra	Dihang	China	38	-	8	16	138
3	03_82O_044	NRSC		CH_1037	3552	WB	Brahmaputra	Dihang	China	83	-	-	35	137
4	03_78I_085	NRSC		BH_166	4764	WB	Brahmaputra	Puna Tsang Chu	Bhutan	72	-	12	31	132
5	03_82K_040	NRSC		CH_896	4329	WB	Brahmaputra		China	57	-	23	27	111
6	03_82K_042	NRSC		CH_898	4364	WB	Brahmaputra		China	177	-	35	85	108
7	03_91C_005	NRSC		CH_1056	4926	GL	Brahmaputra		China	101	-	16	50	102
8	03_82K_049	NRSC		CH_905	4180	WB	Brahmaputra		China	41	-	18	21	95
9	03_92A_005	NRSC		AP_203	3391	WB	Brahmaputra	Luhit	India	52	-	17	27	93
10	03_91C_070	NRSC		CH_1098	4252	WB	Brahmaputra	Dibang	China	54	-	21	29	86

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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_91C_074	NRSC		CH_1102	4258	GL	Brahmaputra	Dibang	China	39	-	17	21	86
12	03_82J_024	NRSC		CH_854	4362	WB	Brahmaputra		China	70	-	25	38	84
13	03_91C_049	NRSC		AP_95	4261	WB	Brahmaputra	Dibang	India	58	-	15	32	81
14	03_82K_103	NRSC		CH_959	3964	WB	Brahmaputra		China	40	-	15	23	74
15	03_91C_078	NRSC		CH_1106	3694	WB	Brahmaputra	Dibang	China	45	-	26	26	73
16	03_82K_045	NRSC		CH_901	4572	WB	Brahmaputra		China	47	-	28	25	68
17	03_82K_007	NRSC		CH_863	4294	WB	Brahmaputra		China	128	-	49	79	62
18	03_91C_042	NRSC		AP_89	4531	WB	Brahmaputra	Dibang	India	50	-	19	32	56
19	03_91C_014	NRSC		CH_1065	4033	GL	Brahmaputra		China	65	-	45	42	44
20	03_78M_019	NRSC		BH_194	4697	WB	Brahmaputra	Dange Chu	Bhutan	64	-	45	45	42
21	03_82J_019	NRSC		CH_849	3944	GL	Brahmaputra		China	91	-	64	52	42
22	03_91H_011	NRSC		CH_1176	4494	WB	Brahmaputra	Luhit	China	52	-	37	32	41
23	03_91D_080	NRSC		CH_1135	4295	WB	Brahmaputra	Luhit	China	35	-	25	20	40

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July- 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	03_77P_023	NRSC		CH_593	4235	WB	Brahmaputra	Kuri Chu	China	70	-	50	43	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

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July- 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_91D_010	NRSC		AP_109	3323	WB	Brahmaputra	Dibang	India	55	-	40	34	38
2	02_71P_054	NRSC		CH_242	4859		Ganga	Arun Kosi	China	104	-	76	75	37
3	03_78A_021	NRSC		SK_26	5431	GL	Brahmaputra	Teesta	India	76	56	53	50	36
4	02_62J_003	NRSC	254G	NP_19	4854	WB	Ganga	Karnal	Nepal	61	-	45	42	36
5	02_71L_010	NRSC	185G	CH_165	5387	GL	Ganga	Sun Kosi	China	72	-	53	46	36
6	03_82F_016	NRSC		CH_741	4632	WB	Brahmaputra		China	42	-	28	31	35
7	03_82N_004	NRSC		CH_975	4290	GL	Brahmaputra		China	142	106	71	75	34
8	03_91H_025	NRSC		CH_1190	3741	WB	Brahmaputra	Luhit	China	122	85	91	61	34
9	03_91H_010	NRSC		CH_1175	4433	WB	Brahmaputra	Luhit	China	97	-	73	66	33
10	03_78E_026	NRSC		CH_613	5161	GL	Brahmaputra	Amo Chu	China	57	-	43	43	33
11	03_82K_002	NRSC		CH_858	3998	WB	Brahmaputra		China	74	57	50	44	30

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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_066	NRSC		BH_34	4896	GL	Brahmaputra	Manas Chu & Mangde Chu	Bhutan	172	134	132	133	28
13	02_77D_009	NRSC	71G	CH_264	5296	GL	Ganga	Arun Kosi	China	71	56	46	44	27
14	03_78M_020	NRSC		BH_195	4157	WB	Brahmaputra	Dangme Chu	Bhutan	75	59	54	56	27
15	01_61C_011	NRSC		CH_39	4494	WB	Indus	Indus	China	685	434	539	472	27
16	03_91D_107	NRSC		AP_163	3769	WB	Brahmaputra	Luhit	India	68	-	49	54	26
17	03_82J_008	NRSC		CH_838	4036	GL	Brahmaputra		China	211	166	167	165	26
18	03_77L_043	NRSC		CH_552	5200	GL	Brahmaputra	Kuri Chu	China	236	178	188	189	25
19	01_52I_004	NRSC		JK_196	5141	WB	Indus	Shyok	India	78	-	63	62	24
20	02_71P_019	NRSC		CH_207	4199	GL	Ganga	Arun Kosi	China	67	-	55	46	22
21	03_82N_019	NRSC		CH_990	4877	WB	Brahmaputra		China	47	-	39	39	21
22	02_78A_004	NRSC	194G	CH_270	5603	GL	Ganga	Arun Kosi	China	122	85	102	95	20
23	03_91H_040	NRSC		CH_1205	4324	WB	Brahmaputra	Luhit	China	54	-	45	41	20
24	03_78M_022	NRSC		BH_197	4549	WB	Brahmaputra	Dangme Chu	Bhutan	67	-	54	56	20

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
25	03_82G_023	NRSC		CH_784	4377	WB	Brahmaputra		China	91	76	70	65	20
26	03_82O_061	NRSC		AP_54	3811	WB	Brahmaputra	Dibang	India	56	47	41	44	19
27	03_91D_009	NRSC		AP_108	4037	WB	Brahmaputra	Dibang	India	44	-	37	30	19
28	01_61C_010	NRSC		CH_38	4495	WB	Indus	Indus	China	144	94	118	121	19
29	02_71P_040	NRSC	126G	CH_228	4962	WB	Ganga	Arun Kosi	China	154	131	129	115	18
30	03_82O_062	NRSC		AP_55	3612	WB	Brahmaputra	Dibang	India	49	42	9	24	17
31	03_71K_007	NRSC		CH_430	4752	WB	Brahmaputra		China	112	96	82	80	17
32	02_71L_004	NRSC	5G	CH_159	5518	GL	Ganga	Arun Kosi	China	132	78	114	92	16
33	03_82O_064	NRSC		AP_57	3689	WB	Brahmaputra	Dihang	India	43	-	37	31	16
34	02_77D_008	NRSC	266G	CH_263	5285	GL	Ganga	Arun Kosi	China	50	-	43	34	16
35	03_77L_014	NRSC		CH_530	5289	WB	Brahmaputra		China	43	-	37	36	16
36	03_82K_074	NRSC		CH_930	4553	WB	Brahmaputra		China	79	-	68	64	16
37	03_77H_023	NRSC		CH_492	5313	WB	Brahmaputra		China	47	-	41	33	15
38	01_43K_010	NRSC		JK_111	3946	WB	Indus	Jhelum	India	75	65	60	60	15

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
39	03_78E_029	NRSC		BH_73	4250	WB	Brahmaputra	Puna Tsang Chu	Bhutan	38	-	33	28	15
40	02_72M_016	NRSC	7G	NP_92	4572	GL	Ganga	Arun Kosi	Nepal	226	139	199	163	14
41	01_52H_005	NRSC		HP_6	4286	WB	Indus	Chenab	India	49	-	43	38	14
42	03_77H_003	NRSC		CH_478	4714	WB	Brahmaputra		China	263	231	148	145	14
43	03_91D_022	NRSC		AP_118	3143	WB	Brahmaputra	Dibang	India	41	-	36	30	14
44	02_72I_011	NRSC	1G	NP_64	5034	GL	Ganga	Sun Kosi	Nepal	181	103	160	130	13
45	03_77L_010	NRSC		CH_526	4457	WB	Brahmaputra		China	45	-	40	37	13
46	03_82F_022	NRSC		CH_747	4200	GL	Brahmaputra		China	111	98	89	93	13
47	03_78I_051	NRSC		BH_132	5074	GL	Brahmaputra	Manas Chu & Mangde Chu	Bhutan	125	112	88	95	12
48	03_62O_040	NRSC		CH_385	4896	WB	Brahmaputra		China	133	112	119	113	12
49	03_82K_017	NRSC		CH_873	4397	WB	Brahmaputra		China	174	-	146	155	12
50	02_71L_032	NRSC	122G	CH_187	5250	GL	Ganga	Sun Kosi	China	57	51	51	51	12

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
51	03_82P_010	NRSC		AP_67	1676	WB	Brahmaputra	Dibang	India	91	-	81	68	12
52	01_52H_004	NRSC		HP_5	4155	GL	Indus	Chenab	India	158	-	142	114	11
53	02_71H_029	NRSC	1G	CH_149	5098	GL	Ganga	Sun Kosi	China	536	484	411	452	11
54	03_77L_033	NRSC		BH_13	5176	GL	Brahmaputra		Bhutan	219	186	197	185	11
55	03_78A_014	NRSC/S DC	/Very High Risk	SK_20	5234	GL	Brahmaputra	Teesta	India	156	132	140	125	11
56	03_82B_010	NRSC		CH_636	4990	WB	Brahmaputra		China	55	50	47	41	10
57	01_61G_002	NRSC		CH_63	4663	WB	Indus	Indus	China	1438	1218	1308	1264	10
58	03_77L_013	NRSC		CH_529	5191	WB	Brahmaputra		China	375	342	327	315	10
59	03_82G_060	NRSC		CH_821	4577	WB	Brahmaputra		China	48	-	34	44	9
60	03_92E_001	NRSC		AP_206	4206	WB	Brahmaputra	Luhit	India	47	-	43	30	9
61	03_82B_028	NRSC		CH_654	4998	WB	Brahmaputra		China	49	-	45	40	9
62	02_71P_016	NRSC		CH_204	4182	WB	Ganga	Arun Kosi	China	164	151	139	124	9
63	02_72M_007	NRSC	33G	CH_253	4950	GL	Ganga	Arun Kosi	China	106	88	97	89	9

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
64	03_62J_026	NRSC		CH_298	5078	GL	Brahmaputra		China	134	115	123	116	9
65	01_62E_005	NRSC		CH_80	5174	WB	Indus	Indus	China	216	193	198	187	9
66	03_78M_010	NRSC		BH_188	4496	WB	Brahmaputra	Dangme Chu	Bhutan	38	-	35	33	9
67	03_77O_001	NRSC		CH_564	3879	WB	Brahmaputra		China	175	153	160	159	9
68	03_91C_059	NRSC		CH_1089	4303	WB	Brahmaputra	Dibang	China	83	-	76	72	9
69	03_82N_030	NRSC		CH_1001	4462	GL	Brahmaputra		China	115	-	106	100	8
70	03_91D_041	NRSC		AP_135	3526	WB	Brahmaputra	Dibang	India	119	110	103	85	8
71	02_71L_006	NRSC	3G	CH_161	5365	GL	Ganga	Arun Kosi	China	410	372	380	341	8
72	03_82L_009	NRSC		CH_971	3893	GL	Brahmaputra		China	65	55	60	54	8
73	03_77L_072	NRSC		BH_40	5201	GL	Brahmaputra	Manas Chu & Mangde Chu	Bhutan	95	88	79	82	8
74	03_77L_041	NRSC		CH_550	5214	GL	Brahmaputra	Kuri Chu	China	66	-	61	57	8
75	01_53A_001	NRSC		HP_9	409	WB	Indus	Beas	India	23732	22072	18290	17771	8

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
76	03_77L_044	NRSC		BH_19	4385	GL	Brahmaputra	Puna Tsang Chu	Bhutan	130	121	103	110	7
77	02_71P_028	NRSC		CH_216	4997	GL	Ganga	Arun Kosi	China	65	44	58	61	7
78	01_52J_005	NRSC		JK_201	5430	WB	Indus	Shyok	India	47	-	44	37	7
79	03_62J_032	NRSC		CH_304	4857	GL	Brahmaputra		China	95	89	89	82	7
80	03_82J_023	NRSC		CH_853	4315	WB	Brahmaputra		China	110	101	103	99	7
81	03_71K_011	NRSC		CH_434	4761	WB	Brahmaputra		China	436	409	399	371	7
82	02_72I_023	NRSC	227G	NP_76	5232	GL	Ganga	Sun Kosi	Nepal	87	82	70	72	6
83	03_77P_009	NRSC		CH_580	5086	WB	Brahmaputra		China	112	104	106	100	6
84	02_78A_003	NRSC	24G	CH_269	5522	GL	Ganga	Arun Kosi	China	161	131	152	137	6
85	02_71P_025	NRSC		CH_213	4807	WB	Ganga	Arun Kosi	China	135	110	127	107	6
86	01_52K_012	NRSC		JK_220	4695	WB	Indus	Indus	India	169	160	159	156	6
87	03_82B_007	NRSC		CH_633	4964	WB	Brahmaputra		China	219	206	207	196	6
88	03_77K_015	NRSC		CH_517	4455	WB	Brahmaputra		China	115	106	108	106	6

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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	03_91C_040	NRSC		AP_87	4450	WB	Brahmaputra	Luhit	India	75	-	71	60	6
90	01_61C_002	NRSC		CH_30	4494	WB	Indus	Indus	China	862	717	822	779	5
91	03_77D_002	NRSC		SK_2	5156	GL	Brahmaputra	Teesta	India	118	112	101	96	5
92	03_77L_017	NRSC		CH_533	5340	WB	Brahmaputra		China	80	76	75	71	5
93	03_78A_009	NRSC		SK_16	5044	GL	Brahmaputra	Teesta	India	64	61	55	52	5
94	03_82B_008	NRSC		CH_634	4928	WB	Brahmaputra		China	275	262	262	254	5
95	01_53A_002	NRSC		HP_10	495	WB	Indus	Satluj	India	12843	12198	11339	11603	5
96	03_82B_021	NRSC		CH_647	5041	WB	Brahmaputra		China	54	52	44	39	4
97	03_71C_011	NRSC		CH_404	4684	WB	Brahmaputra		China	159	127	153	138	4
98	02_71L_028	NRSC	38G	CH_183	5027	GL	Ganga	Sun Kosi	China	102	82	98	91	4
99	01_61B_003	NRSC		CH_28	5074	WB	Indus	Indus	China	227	218	193	196	4
100	02_71P_022	NRSC	34G	CH_210	5439	GL	Ganga	Arun Kosi	China	85	82	82	70	4
101	01_61C_022	NRSC		CH_50	4339	WB	Indus	Indus	China	1618	1494	1560	1459	4
102	03_71G_006	NRSC		CH_415	5065	WB	Brahmaputra		China	1005	970	955	933	4
103	01_61C_012	NRSC		CH_40	4282	WB	Indus	Indus	China	342	317	330	308	4

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
104	01_61H_001	NRSC		CH_66	4619	WB	Indus	Indus	China	330	317	315	287	4
105	01_43G_001	NRSC		JK_67	346	WB	Indus	Jhelum	India	23887	22572	22977	22344	4
106	03_82C_010	NRSC		CH_665	4921	WB	Brahmaputra		China	154	149	120	128	3
107	03_62O_042	NRSC		CH_387	4964	WB	Brahmaputra		China	60	58	56	55	3
108	03_82B_002	NRSC		CH_628	4906	WB	Brahmaputra		China	464	449	436	422	3
109	01_62E_006	NRSC		CH_81	5055	WB	Indus	Indus	China	539	516	522	506	3
110	01_52O_001	NRSC		CH_4	4242	WB	Indus	Shyok	China	69953	66075	67960	66500	3
111	03_77L_012	NRSC		CH_528	5014	WB	Brahmaputra		China	29829	28995	29060	28965	3
112	02_71L_003	NRSC		CH_158	5324	WB	Ganga	Arun Kosi	China	283	276	273	267	3
113	01_61C_005	NRSC		CH_33	4495	WB	Indus	Indus	China	390	153	384	279	2
114	01_61C_005	NRSC		CH_33	4495	WB	Indus	Indus	China	390	153	384	279	2
115	03_62J_031	NRSC		CH_303	4897	GL	Brahmaputra		China	223	174	218	192	2
116	03_91C_044	NRSC		AP_90	4230	WB	Brahmaputra	Luhit	India	65	64	52	52	2
117	03_62K_009	NRSC		CH_313	5079	GL	Brahmaputra		China	319	265	312	291	2
118	02_72I_003	NRSC	319G	NP_59	4762	GL	Ganga	Sun Kosi	Nepal	43	-	42	36	2

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
119	03_78E_023	NRSC		CH_612	5291	GL	Brahmaputra		China	57	-	48	56	2
120	02_72M_009	NRSC	51G	NP_86	4932	GL	Ganga	TamurKosi	Nepal	65	-	64	56	2
121	03_82G_048	NRSC		CH_809	4663	WB	Brahmaputra		China	47	38	46	43	2
122	01_43N_030	NRSC		JK_157	3799	WB	Indus	Jhelum	India	89	87	76	77	2
123	03_62J_011	NRSC		CH_283	5181	WB	Brahmaputra		China	388	355	380	365	2
124	03_78E_010	NRSC		CH_606	4582	WB	Brahmaputra		China	44	-	43	37	2
125	02_71L_002	NRSC		CH_157	5261	WB	Ganga	Arun Kosi	China	83	71	81	79	2
126	03_62N_009	NRSC		CH_326	5241	WB	Brahmaputra		China	299	289	292	280	2
127	01_42H_001	NRSC		JK_1	4292	WB	Indus	Gilgit	India	274	264	268	254	2
128	03_77H_008	NRSC		CH_482	4570	WB	Brahmaputra		China	1277	1250	1134	1147	2
129	03_62N_021	NRSC		CH_338	5432	WB	Brahmaputra		China	204	200	185	183	2
130	03_62J_013	NRSC		CH_285	4934	WB	Brahmaputra		China	955	935	933	911	2
131	02_71L_011	NRSC	61G	CH_166	5439	GL	Ganga	Sun Kosi	China	56	55	54	53	2

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulner ability	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
132	03_71K_006	NRSC		CH_429	4847	WB	Brahmaputra		China	2210	2173	2088	2036	2
133	03_71G_001	NRSC		CH_410	5163	WB	Brahmaputra		China	768	741	753	732	2
134	03_82K_018	NRSC		CH_874	4168	WB	Brahmaputra		China	177	175	65	92	1
135	03_78E_007	NRSC		BH_60	5008	GL	Brahmaputra	Puna Tsang Chu	Bhutan	68	67	47	52	1
136	03_91C_038	NRSC		AP_85	4002	WB	Brahmaputra	Dibang	India	86	-	73	85	1
137	03_82J_005	NRSC		CH_835	4134	GL	Brahmaputra		China	75	74	58	60	1
138	03_82G_035	NRSC		CH_796	4386	WB	Brahmaputra		China	89	80	88	74	1
139	01_61C_021	NRSC		CH_49	4349	WB	Indus	Indus	China	1210	1147	1195	1071	1
140	02_62P_003	NRSC	4G	NP_36	4937	GL	Ganga	Trisuli	Nepal	333	330	320	298	1
141	01_61C_015	NRSC		CH_43	4280	WB	Indus	Indus	China	842	777	832	770	1
142	01_61C_001	NRSC		CH_29	4526	WB	Indus	Indus	China	11721	11304	11562	11424	1
143	03_77L_001	NRSC		CH_520	4443	WB	Brahmaputra		China	56947	56442	54547	54439	1
144	01_52K_004	NRSC		JK_212	4293	WB	Indus	Shyok	India	5851	5797	5817	5737	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

Sl. No.	Lake ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of July-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	01_52H_002	NRSC/SDC	4I/Very High Risk	HP_3	4101	GL	Indus	Chenab	India	97	61	97	83	0
2	03_78I_023	NRSC		BH_104	5055	GL	Brahmaputra	Manas Chu & Mangde Chu	Bhutan	52	52	48	44	0
3	02_71D_004	NRSC	16G	NP_45	4064	GL	Ganga	Trisuli	Nepal	98	75	98	90	0
4	03_62J_016	NRSC		CH_288	5303	GL	Brahmaputra		China	54	-	54	44	0
5	02_71L_026	NRSC	73G	CH_181	5057	GL	Ganga	Sun Kosi	China	67	56	67	62	0
6	01_62E_004	NRSC		CH_79	5161	WB	Indus	Indus	China	248	227	248	238	0
7	03_82B_005	NRSC		CH_631	4888	WB	Brahmaputra		China	215	215	211	203	0
8	01_61C_024	NRSC		CH_52	4323	WB	Indus	Indus	China	5108	4733	5107	4842	0
9	02_71L_023	NRSC	39G	CH_178	5106	GL	Ganga	Arun Kosi	China	128	124	128	121	0
10	03_77D_003	NRSC		SK_3	5098	WB	Brahmaputra	Teesta	India	97	97	93	91	0

Sl. No.	Lake ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of July-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	02_71L_013	NRSC	58G	CH_168	5324	GL	Ganga	Sun Kosi	China	59	57	59	56	0
12	01_61C_016	NRSC		CH_44	4289	WB	Indus	Indus	China	378	377	364	360	0
13	03_82K_077	NRSC		CH_933	4590	WB	Brahmaputra		China	99	-	99	94	0
14	01_62J_001	NRSC		CH_102	4784	WB	Indus	Satluj	China	5754	5525	5774	5583	0
15	03_91C_025	NRSC		CH_1076	4022	GL	Brahmaputra		China	113	107	113	107	0
16	03_71K_002	NRSC		CH_425	4974	WB	Brahmaputra		China	2360	2369	2288	2280	0
17	03_62N_001	NRSC		CH_318	5102	WB	Brahmaputra		China	14865	14352	14856	14616	0
18	03_91C_029	NRSC		CH_1078	4229	WB	Brahmaputra		China	220	221	218	211	0
19	03_77P_020	NRSC		CH_591	4649	WB	Brahmaputra	Kuri Chu	China	58	58	45	50	0
20	03_77L_030	NRSC		BH_12	5305	GL	Brahmaputra		Bhutan	89	89	73	76	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

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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_82N_033	NRSC		CH_1004	4357	GL	Brahmaputra		China	85	86	69	67	-1
2	03_62K_012	NRSC		CH_316	5368	GL	Brahmaputra		China	84	78	85	75	-1
3	02_71H_003	NRSC		CH_123	4649	WB	Ganga	Arun Kosi	China	217	193	220	211	-1
4	03_82E_002	NRSC		CH_720	5008	WB	Brahmaputra		China	691	675	701	613	-1
5	03_82A_007	NRSC		CH_626	4911	WB	Brahmaputra		China	92	87	93	88	-1
6	03_77D_005	NRSC/S DC	/Very High Risk	SK_5	5249	GL	Brahmaputra	Teesta	India	97	98	94	84	-1
7	03_62O_038	NRSC		CH_383	4893	WB	Brahmaputra		China	135	128	136	130	-1
8	01_43A_001	NRSC		JK_22	3641	WB	Indus	Gilgit	India	205	196	208	194	-1
9	02_71H_002	NRSC		CH_122	4650	WB	Ganga	Arun Kosi	China	2452	2353	2466	2390	-1
10	02_71H_015	NRSC		CH_135	5367	GL	Ganga	Arun Kosi	China	532	540	537	524	-1
11	01_52N_001	NRSC		CH_3	4964	WB	Indus	Indus	China	12209	11883	12283	12099	-1
12	03_62K_001	NRSC		CH_305	4834	WB	Brahmaputra		China	394	396	395	376	-1

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
13	01_61F_003	NRSC		CH_60	5256	WB	Indus	Indus	China	562	565	536	512	-1
14	03_78A_013	NRSC		SK_19	5470	GL	Brahmaputra	Teesta	India	80	74	81	77	-1
15	03_82B_020	NRSC		CH_646	4986	WB	Brahmaputra		China	46	-	47	41	-2
16	03_77L_077	NRSC		BH_45	5136	WB	Brahmaputra	Puna Tsang Chu	Bhutan	54	55	10	29	-2
17	03_82K_037	NRSC		CH_893	4147	WB	Brahmaputra		China	54	55	21	30	-2
18	03_82G_055	NRSC		CH_816	4619	WB	Brahmaputra		China	42	-	31	43	-2
19	02_71P_027	NRSC	82G	CH_215	5389	GL	Ganga	Arun Kosi	China	54	-	55	40	-2
20	03_91H_005	NRSC		CH_117 0	4123	WB	Brahmaputra	Luhit	China	59	56	60	46	-2
21	02_62F_019	NRSC	144G	NP_12	5039	WB	Ganga	Karnal	Nepal	63	56	64	59	-2
22	02_71P_047	NRSC	81G	CH_235	5614	GL	Ganga	Arun Kosi	China	84	82	86	72	-2
23	03_82G_051	NRSC		CH_812	4735	WB	Brahmaputra		China	41	-	42	35	-2
24	03_82F_014	NRSC		CH_739	4691	GL	Brahmaputra		China	44	-	45	35	-2
25	03_77L_042	NRSC		CH_551	5057	GL	Brahmaputra	Kuri Chu	China	61	62	61	60	-2

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
26	03_82A_004	NRSC		CH_623	5008	WB	Brahmaputra		China	48	-	49	42	-2
27	01_52K_014	NRSC		JK_222	4535	WB	Indus	Indus	India	439	446	413	410	-2
28	02_71H_028	NRSC	15G	CH_148	5174	WB	Ganga	Sun Kosi	China	191	194	194	195	-2
29	02_62K_012	NRSC		NP_30	3653	WB	Ganga	Bheri	Nepal	482	481	494	471	-2
30	03_82F_008	NRSC		CH_733	4828	WB	Brahmaputra		China	86	84	88	83	-2
31	01_52O_005	NRSC		CH_8	4358	WB	Indus	Indus	China	816	829	792	757	-2
32	03_82B_014	NRSC		CH_640	4825	WB	Brahmaputra		China	152	155	152	127	-2
33	01_52L_002	NRSC		JK_226	4986	WB	Indus	Indus	India	416	406	423	408	-2
34	03_71P_001	NRSC		CH_448	5302	WB	Brahmaputra		China	128	130	130	127	-2
35	03_77K_017	NRSC		CH_519	4448	WB	Brahmaputra		China	3746	3807	3760	3734	-2
36	03_62J_012	NRSC		CH_284	4883	WB	Brahmaputra		China	165	164	168	159	-2
37	03_71B_002	NRSC		CH_392	5388	WB	Brahmaputra		China	8108	8251	8211	8132	-2
38	03_71K_009	NRSC		CH_432	4750	WB	Brahmaputra		China	254	258	218	193	-2
39	02_62K_010	NRSC		NP_28	2975	WB	Ganga	Karnal	Nepal	1038	1054	1048	1026	-2
40	03_82G_019	NRSC		CH_780	4460	WB	Brahmaputra		China	56	58	40	47	-3

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
41	03_82J_025	NRSC		CH_855	4038	WB	Brahmaputra		China	57	59	45	41	-3
42	03_82J_004	NRSC		CH_834	3957	GL	Brahmaputra		China	508	378	526	474	-3
43	03_71O_006	NRSC		CH_442	4738	WB	Brahmaputra		China	111	104	115	109	-3
44	03_82B_009	NRSC		CH_635	4963	WB	Brahmaputra		China	170	176	174	166	-3
45	01_43N_001	NRSC		JK_128	4142	WB	Indus	Shingo (Indus)	India	127	131	124	122	-3
46	03_62O_041	NRSC		CH_386	4963	WB	Brahmaputra		China	207	208	214	205	-3
47	03_71O_009	NRSC		CH_445	4302	WB	Brahmaputra		China	2147	2111	2210	2129	-3
48	02_71H_008	NRSC		CH_128	5152	GL	Ganga	Arun Kosi	China	106	99	109	101	-3
49	01_43A_002	NRSC		JK_23	3790	WB	Indus	Gilgit	India	101	96	104	95	-3
50	02_71D_007	NRSC		NP_48	700	WB	Ganga	Trisuli	Nepal	284	294	281	280	-3
51	01_62A_003	NRSC		CH_69	5142	WB	Indus	Indus	China	1339	1385	1343	1304	-3
52	03_62N_004	NRSC		CH_321	5168	WB	Brahmaputra		China	893	899	925	900	-3
53	03_62N_017	NRSC		CH_334	5454	WB	Brahmaputra		China	78	79	80	77	-3
54	01_43J_017	NRSC	3I	JK_95	3580	WB	Indus	Jhelum	India	155	160	159	153	-3

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
55	03_82D_004	NRSC		CH_710	4481	WB	Brahmaputra		China	370	375	382	372	-3
56	03_82F_030	NRSC		CH_755	3485	WB	Brahmaputra		China	2666	2735	2694	2665	-3
57	01_52L_001	NRSC		JK_225	4523	WB	Indus	Satluj	India	13922	14351	14180	14105	-3
58	03_82F_007	NRSC		CH_732	4801	GL	Brahmaputra		China	116	120	119	113	-3
59	03_82O_016	NRSC		CH_102 3	4374	WB	Brahmaputra	Dihang	China	90	94	21	41	-4
60	03_82K_009	NRSC		CH_865	4168	WB	Brahmaputra		China	105	109	60	82	-4
61	02_71P_029	NRSC	43G	CH_217	5045	GL	Ganga	Arun Kosi	China	98	76	102	82	-4
62	01_62F_010	NRSC	9I	CH_101	5250	GL	Indus	Satluj	China	64	-	67	53	-4
63	03_78E_017	NRSC		CH_609	5253	GL	Brahmaputra		China	44	-	38	46	-4
64	03_82K_006	NRSC		CH_862	4523	WB	Brahmaputra		China	46	48	40	44	-4
65	03_77L_035	NRSC		BH_14	5486	GL	Brahmaputra		Bhutan	68	71	49	52	-4
66	03_82A_002	NRSC		CH_621	4905	WB	Brahmaputra		China	365	351	382	355	-4
67	03_62K_002	NRSC		CH_306	4858	WB	Brahmaputra		China	49	-	51	44	-4
68	03_77H_011	NRSC		BH_4	4963	GL	Brahmaputra		Bhutan	154	161	158	142	-4

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69	01_61C_023	NRSC		CH_51	4350	WB	Indus	Indus	China	642	672	622	599	-4
70	03_82D_003	NRSC		CH_709	4408	WB	Brahmaputra		China	44	46	44	43	-4
71	03_77L_037	NRSC		BH_15	5139	GL	Brahmaputra		Bhutan	574	599	599	578	-4
72	03_82E_007	NRSC		CH_725	5043	WB	Brahmaputra		China	65	68	68	65	-4
73	02_71H_001	NRSC		CH_121	4580	WB	Ganga	Arun Kosi	China	25887	26974	26951	26898	-4
74	03_78I_018	NRSC		BH_99	5083	GL	Brahmaputra	Puna Tsang Chu	Bhutan	66	69	68	65	-4
75	01_62E_015	NRSC		CH_90	5415	WB	Indus	Satluj	China	48	50	49	46	-4
76	03_82E_003	NRSC		CH_721	5027	WB	Brahmaputra		China	94	98	95	94	-4
77	02_71L_001	NRSC		CH_156	5106	WB	Ganga	Arun Kosi	China	82	81	85	82	-4
78	03_77N_004	NRSC		CH_563	3890	WB	Brahmaputra		China	1203	1257	1238	1231	-4
79	03_62O_030	NRSC		CH_375	5013	WB	Brahmaputra		China	107	99	111	101	-4
80	01_43M_003	NRSC		JK_120	2663	WB	Indus	Shigar (Indus)	India	215	198	224	220	-4
81	03_77L_009	NRSC		CH_525	4515	WB	Brahmaputra		China	559	569	584	542	-4

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82	03_91C_046	NRSC		AP_92	3353	WB	Brahmaputra	Dibang	India	57	60	43	46	-5
83	02_71P_043	NRSC	18G	CH_231	5206	GL	Ganga	Arun Kosi	China	73	66	77	64	-5
84	03_62O_027	NRSC		CH_372	4575	WB	Brahmaputra		China	37	-	39	35	-5
85	03_71K_003	NRSC		CH_426	4982	WB	Brahmaputra		China	83	73	87	76	-5
86	03_78M_003	NRSC		CH_614	4459	WB	Brahmaputra	Dangm e Chu	China	204	215	168	186	-5
87	02_53O_001	NRSC		UK_4	1968	WB	Ganga	Ramga nga	India	38	-	40	33	-5
88	03_62O_032	NRSC		CH_377	5012	WB	Brahmaputra		China	52	-	55	45	-5
89	03_71G_011	NRSC		CH_420	4619	WB	Brahmaputra		China	1393	1236	1461	1318	-5
90	02_72M_006	NRSC	349G	CH_252	5188	GL	Ganga	Arun Kosi	China	63	64	66	61	-5
91	02_71H_027	NRSC	2G	CH_147	5242	GL	Ganga	Sun Kosi	China	455	480	441	437	-5
92	01_61D_004	NRSC		CH_56	4991	WB	Indus	Indus	China	520	501	546	511	-5
93	02_71H_017	NRSC		CH_137	5314	GL	Ganga	Arun Kosi	China	485	512	485	475	-5
94	03_82F_004	NRSC		CH_729	4508	WB	Brahmaputra		China	680	713	701	690	-5

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95	03_77L_027	NRSC		CH_543	4531	WB	Brahmaputra	Kuri Chu	China	179	188	173	168	-5
96	01_52O_003	NRSC		CH_6	4252	WB	Indus	Indus	China	208	220	196	181	-5
97	03_62J_015	NRSC		CH_287	5207	WB	Brahmaputra		China	81	80	85	82	-5
98	02_72M_005	NRSC	139G	CH_251	5141	GL	Ganga	Arun Kosi	China	74	79	78	69	-6
99	03_82K_080	NRSC		CH_936	4530	WB	Brahmaputra		China	46	-	49	37	-6
100	03_62N_022	NRSC		CH_339	4599	WB	Brahmaputra		China	183	193	194	187	-6
101	01_62E_003	NRSC		CH_78	5104	WB	Indus	Indus	China	148	148	157	148	-6
102	03_82B_006	NRSC		CH_632	4837	WB	Brahmaputra		China	117	121	125	120	-6
103	01_52K_016	NRSC		JK_224	4675	WB	Indus	Satluj	India	520	555	523	514	-6
104	02_71H_007	NRSC		CH_127	5149	GL	Ganga	Arun Kosi	China	115	122	120	117	-6
105	01_52K_009	NRSC		JK_217	4921	WB	Indus	Shyok	India	192	205	196	191	-6
106	01_43J_020	NRSC		JK_98	1584	WB	Indus	Jhelum	India	173	185	168	164	-6
107	03_91C_064	NRSC		AP_100	3972	WB	Brahmaputra	Dibang	India	68	-	72	65	-6
108	03_82J_017	NRSC		CH_847	3829	WB	Brahmaputra		China	269	287	284	279	-6
109	02_72I_004	NRSC	9G	CH_244	5074	GL	Ganga	Sun Kosi	China	187	125	201	174	-7

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110	01_43N_027	NRSC		JK_154	3683	WB	Indus	Jhelum	India	41	-	44	38	-7
111	03_77D_008	NRSC		SK_8	5039	GL	Brahmaputra	Teesta	India	43	-	46	35	-7
112	03_77P_012	NRSC		CH_583	4975	WB	Brahmaputra		China	68	73	61	56	-7
113	01_52C_003	NRSC	7I	JK_187	4512	GL	Indus	Indus	India	56	-	60	49	-7
114	01_61C_014	NRSC		CH_42	4279	WB	Indus	Indus	China	289	305	311	298	-7
115	01_61D_002	NRSC		CH_54	4313	WB	Indus	Indus	China	1545	1654	1562	1461	-7
116	01_43K_014	NRSC		JK_115	3521	WB	Indus	Jhelum	India	129	134	138	126	-7
117	03_78E_012	NRSC		CH_607	4576	WB	Brahmaputra		China	261	274	280	267	-7
118	03_77L_003	NRSC		CH_521	4434	WB	Brahmaputra		China	3817	4113	4016	4022	-7
119	03_82J_014	NRSC		CH_844	3703	WB	Brahmaputra		China	171	183	158	147	-7
120	03_82O_054	NRSC		CH_104 6	3311	WB	Brahmaputra	Dibang	China	47	51	19	33	-8
121	03_82K_036	NRSC		CH_892	4251	WB	Brahmaputra		China	59	64	38	36	-8
122	03_77P_021	NRSC		CH_592	4749	GL	Brahmaputra	Dangm e Chu	China	59	64	45	47	-8
123	03_82G_050	NRSC		CH_811	4734	WB	Brahmaputra		China	37	-	40	34	-8
124	03_62O_024	NRSC		CH_369	4637	WB	Brahmaputra		China	825	740	894	814	-8

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125	02_71H_021	NRSC	76G	CH_141	4463	GL	Ganga	Trisuli	China	44	-	48	40	-8
126	03_71C_003	NRSC		CH_396	5412	GL	Brahmaputra		China	48	-	52	45	-8
127	03_77P_019	NRSC		CH_590	4637	WB	Brahmaputra	Dangm e Chu	China	241	237	263	240	-8
128	03_77H_030	NRSC		CH_495	4802	WB	Brahmaputra		China	57	62	58	56	-8
129	03_91C_024	NRSC		CH_107 5	3977	GL	Brahmaputra		China	275	287	298	280	-8
130	03_82G_045	NRSC		CH_806	4523	WB	Brahmaputra		China	68	73	74	69	-8
131	02_62P_004	NRSC		NP_37	807	WB	Ganga	Trisuli	Nepal	362	385	394	389	-8
132	03_62J_001	NRSC		CH_273	5449	WB	Brahmaputra		China	139	151	143	140	-8
133	01_43J_022	NRSC		JK_100	1583	WB	Indus	Jhelum	India	59	62	64	59	-8
134	03_78M_016	NRSC		CH_617	4647	WB	Brahmaputra	Dangm e Chu	China	137	151	117	128	-9
135	03_82K_020	NRSC		CH_876	4364	WB	Brahmaputra		China	77	85	48	54	-9
136	02_71H_035	NRSC		CH_155	4366	WB	Ganga	Sun Kosi	China	43	-	47	41	-9
137	03_92A_006	NRSC		AP_204	1178	WB	Brahmaputra	Luhit	India	75	82	80	78	-9
138	03_82G_062	NRSC		CH_823	4925	WB	Brahmaputra		China	53	-	58	54	-9

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
139	03_82G_009	NRSC		CH_770	4580	WB	Brahmaputra		China	42	-	46	46	-9
140	01_62E_013	NRSC		CH_88	5345	WB	Indus	Indus	China	154	169	167	159	-9
141	01_62F_004	NRSC		CH_95	5493	WB	Indus	Satluj	China	173	186	191	181	-9
142	03_82A_003	NRSC		CH_622	4896	WB	Brahmaputra		China	90	100	92	91	-10
143	02_77D_007	NRSC	244G	CH_262	5215	GL	Ganga	Arun Kosi	China	53	58	59	56	-10
144	03_77J_003	NRSC		CH_499	5039	WB	Brahmaputra		China	82	91	85	84	-10
145	01_62E_010	NRSC		CH_85	5233	WB	Indus	Indus	China	148	164	155	146	-10
146	01_61F_002	NRSC		CH_59	5279	WB	Indus	Indus	China	57	63	54	50	-10
147	03_82K_060	NRSC		CH_916	4316	WB	Brahmaputra		China	88	99	71	68	-11
148	02_78A_005	NRSC		CH_271	5376	GL	Ganga	Arun Kosi	China	103	91	110	116	-11
149	03_82K_075	NRSC		CH_931	4511	WB	Brahmaputra		China	107	-	120	102	-11
150	03_78E_028	NRSC		BH_72	2161	WB	Brahmaputra	Puna Tsang Chu	Bhutan	39	-	44	35	-11
151	01_43E_006	NRSC		JK_30	4186	WB	Indus	Gilgit	India	67	75	66	66	-11
152	01_42H_003	NRSC		JK_3	3854	WB	Indus	Gilgit	India	106	119	109	101	-11

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153	03_91H_067	NRSC		AP_185	3791	WB	Brahmaputra	Luhit	India	42	-	44	47	-11
154	03_82K_068	NRSC		CH_924	4320	WB	Brahmaputra		China	49	55	54	50	-11
155	03_71G_008	NRSC		CH_417	5187	WB	Brahmaputra		China	55	62	60	59	-11
156	03_82F_020	NRSC		CH_745	4110	GL	Brahmaputra		China	66	71	74	68	-11
157	03_82O_029	NRSC		CH_103 2	3345	WB	Brahmaputra	Dihang	China	60	68	44	45	-12
158	03_83A_012	NRSC		AP_77	4287	WB	Brahmaputra	Dangm e Chu	India	53	60	39	46	-12
159	02_71P_015	NRSC		CH_203	4153	WB	Ganga	Arun Kosi	China	932	1031	1059	950	-12
160	01_43N_022	NRSC		JK_149	4243	WB	Indus	Jhelum	India	65	74	72	68	-12
161	03_82B_015	NRSC		CH_641	5124	WB	Brahmaputra		China	74	84	78	76	-12
162	03_77L_032	NRSC		CH_547	4669	GL	Brahmaputra	Kuri Chu	China	98	111	80	82	-12
163	03_71O_010	NRSC		CH_446	4296	WB	Brahmaputra		China	892	850	1017	920	-12
164	03_77H_012	NRSC		CH_483	4723	GL	Brahmaputra		China	71	81	80	76	-12
165	03_78A_018	NRSC		CH_598	4880	WB	Brahmaputra	Amo Chu	China	46	53	17	30	-13

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
166	03_78I_056	NRSC		BH_137	4794	WB	Brahmaputra	Manas Chu & Mang de Chu	Bhutan	73	84	46	57	-13
167	03_82G_024	NRSC		CH_785	4647	WB	Brahmaputra		China	94	108	78	76	-13
168	03_91C_045	NRSC		AP_91	3493	WB	Brahmaputra	Dibang	India	97	111	86	96	-13
169	03_77L_068	NRSC		BH_36	4764	WB	Brahmaputra	Kuri Chu	Bhutan	71	82	69	73	-13
170	03_78E_019	NRSC		CH_611	5022	GL	Brahmaputra		China	54	60	62	58	-13
171	02_71D_008	NRSC		NP_49	639	WB	Ganga	Trisuli	Nepal	91	104	102	98	-13
172	03_82E_004	NRSC		CH_722	5049	WB	Brahmaputra		China	42	48	48	46	-13
173	03_78E_009	NRSC		CH_605	4580	WB	Brahmaputra		China	154	176	168	164	-13
174	03_77P_017	NRSC		CH_588	4751	WB	Brahmaputra	Dangm e Chu	China	2057	2357	2097	2184	-13
175	01_43J_004	NRSC	5I	JK_82	4078	WB	Indus	Jhelum	India	61	70	68	63	-13
176	02_53O_005	NRSC		UK_8	239	WB	Ganga	Ramga nga	India	1114	1284	1263	1160	-13
177	01_43N_020	NRSC		JK_147	4112	WB	Indus	Jhelum	India	56	65	61	58	-14
178	01_43J_007	NRSC	6I	JK_85	3708	WB	Indus	Jhelum	India	88	92	102	92	-14
179	01_52I_003	NRSC		JK_195	5159	WB	Indus	Shyok	India	182	186	211	169	-14

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
180	01_43P_002	NRSC		JK_167	669	WB	Indus	Ravi	India	51	58	59	55	-14
181	01_52O_002	NRSC		CH_5	5262	WB	Indus	Indus	China	99	115	112	102	-14
182	03_91C_034	NRSC		AP_84	4288	WB	Brahmaputra	Dibang	India	133	157	59	80	-15
183	03_77L_051	NRSC		BH_22	4548	GL	Brahmaputra	Puna Tsang Chu	Bhutan	138	142	162	150	-15
184	03_82B_004	NRSC		CH_630	4893	WB	Brahmaputra		China	88	98	103	98	-15
185	03_77L_011	NRSC		CH_527	4533	WB	Brahmaputra		China	1096	1282	1200	1150	-15
186	03_77L_007	NRSC		CH_523	4510	WB	Brahmaputra		China	1345	1582	1380	1402	-15
187	03_78E_006	NRSC		CH_604	4572	WB	Brahmaputra		China	55	65	59	56	-15
188	01_52G_001	NRSC		JK_189	5008	WB	Indus	Shyok	India	37	-	44	38	-16
189	03_82K_039	NRSC		CH_895	4128	WB	Brahmaputra		China	176	211	131	167	-17
190	03_82G_017	NRSC		CH_778	4437	WB	Brahmaputra		China	49	59	51	50	-17
191	03_77L_067	NRSC		BH_35	5231	GL	Brahmaputra	Manas Chu & Mang de Chu	Bhutan	72	87	68	71	-17
192	03_77H_018	NRSC		CH_488	4699	WB	Brahmaputra		China	69	75	83	77	-17

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
193	02_53P_003	NRSC		UK_11	207	WB	Ganga	Ramga nga	India	950	1138	842	844	-17
194	03_77K_009	NRSC		CH_511	3937	WB	Brahmaputra		China	57	67	69	67	-17
195	03_71C_005	NRSC		CH_398	5551	GL	Brahmaputra		China	48	58	56	54	-17
196	03_77B_001	NRSC		CH_452	5039	WB	Brahmaputra		China	47	57	43	44	-18
197	03_78A_001	NRSC/S DC	/High Risk	SK_9	5371	GL	Brahmaputra	Teesta	India	183	162	149	222	-18
198	01_43E_023	NRSC		JK_47	4155	WB	Indus	Gilgit	India	79	96	83	80	-18
199	01_43J_021	NRSC		JK_99	1582	WB	Indus	Jhelum	India	1063	1305	992	1028	-19
200	03_77B_002	NRSC		CH_453	5019	WB	Brahmaputra		China	200	248	210	206	-19
201	03_71G_014	NRSC		CH_423	4606	WB	Brahmaputra		China	177	139	222	181	-20
202	02_77D_006	NRSC		CH_261	4894	GL	Ganga	Arun Kosi	China	78	89	92	97	-20
203	03_82J_018	NRSC		CH_848	3913	GL	Brahmaputra		China	78	94	97	92	-20
204	03_82C_016	NRSC		CH_671	4679	WB	Brahmaputra		China	43	54	50	52	-20
205	03_77C_006	NRSC		CH_460	4514	WB	Brahmaputra		China	81	101	93	91	-20
206	01_43N_032	NRSC		JK_159	3595	WB	Indus	Jhelum	India	48	-	61	50	-21

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
207	03_91H_029	NRSC		CH_1194	3325	WB	Brahmaputra	Luhit	China	38	-	49	37	-22
208	01_61D_003	NRSC		CH_55	4453	WB	Indus	Indus	China	50	64	62	50	-22
209	03_78A_003	NRSC/S DC	/Very High Risk	SK_11	4977	GL	Brahmaputra	Teesta	India	58	-	74	57	-22
210	03_62O_002	NRSC		CH_347	4587	WB	Brahmaputra		China	38	47	49	42	-22
211	02_53K_001	NRSC		UK_1	355	WB	Ganga	Ramga nga	India	4336	5557	5371	5332	-22
212	01_61G_003	NRSC		CH_64	4864	WB	Indus	Indus	China	62	80	58	64	-23
213	02_72I_027	NRSC	41G	NP_80	4977	GL	Ganga	Sun Kosi	Nepal	60	78	73	73	-23
214	03_82O_042	NRSC		AP_49	3093	WB	Brahmaputra	Dibang	India	33	-	43	36	-23
215	03_77H_013	NRSC		CH_484	4950	GL	Brahmaputra		China	40	-	52	43	-23
216	03_62O_039	NRSC		CH_384	4555	WB	Brahmaputra		China	236	306	294	286	-23
217	01_61C_018	NRSC		CH_46	4291	WB	Indus	Indus	China	1572	1958	2037	1901	-23
218	03_71G_010	NRSC		CH_419	4491	WB	Brahmaputra		China	235	310	262	259	-24
219	01_52D_001	NRSC		HP_1	780	WB	Indus	Ravi	India	631	819	838	768	-25
220	02_53K_002	NRSC		UK_2	260	WB	Ganga	Ramga nga	India	1116	1481	1000	918	-25

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
221	01_61G_001	NRSC		CH_62	4973	WB	Indus	Indus	China	61	81	71	71	-25
222	03_91D_081	NRSC		CH_113 6	3356	WB	Brahmaputra	Luhit	China	322	436	312	247	-26
223	01_42H_005	NRSC		JK_5	2237	WB	Indus	Gilgit	India	53	72	60	54	-26
224	01_62E_002	NRSC		CH_77	5139	WB	Indus	Indus	China	128	173	157	149	-26
225	03_71G_013	NRSC		CH_422	4543	WB	Brahmaputra		China	203	228	277	250	-27
226	02_71P_035	NRSC		CH_223	5146	WB	Ganga	Arun Kosi	China	79	108	98	98	-27
227	02_71H_012	NRSC		CH_132	5379	GL	Ganga	Arun Kosi	China	94	-	129	120	-27
228	03_77P_013	NRSC		CH_584	5155	WB	Brahmaputra		China	46	64	52	48	-28
229	03_77P_006	NRSC		CH_577	4616	WB	Brahmaputra		China	4125	5796	5293	4301	-29
230	03_77P_018	NRSC		CH_589	4707	WB	Brahmaputra	Dangm e Chu	China	109	153	129	131	-29
231	02_71P_018	NRSC		CH_206	4199	WB	Ganga	Arun Kosi	China	58	54	82	64	-29
232	01_53E_001	NRSC		HP_12	921	WB	Indus	Beas	India	76	70	109	95	-30
233	01_52L_003	NRSC		JK_227	4985	WB	Indus	Indus	India	477	680	573	594	-30
234	03_77L_006	NRSC		CH_522	4533	WB	Brahmaputra		China	21	-	30	30	-30
235	03_77H_004	NRSC		CH_479	4428	WB	Brahmaputra		China	139	205	149	150	-32

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
236	03_91C_033	NRSC		CH_107_9	4278	GL	Brahmaputra		China	129	190	177	161	-32
237	03_77L_029	NRSC		CH_545	5451	GL	Brahmaputra	Kuri Chu	China	36	-	54	43	-33
238	03_78E_002	NRSC		BH_57	5110	GL	Brahmaputra	Puna Tsang Chu	Bhutan	39	59	35	40	-34
239	03_82G_065	NRSC		CH_826	4148	WB	Brahmaputra		China	39	-	55	59	-34
240	03_82J_020	NRSC		CH_850	3852	WB	Brahmaputra		China	284	439	348	383	-35
241	02_72I_002	NRSC	645G	NP_58	4854	GL	Ganga	Sun Kosi	Nepal	42	65	60	59	-35
242	02_62B_001	NRSC		CH_106	5216	WB	Ganga	Karnal	China	28	42	45	40	-38
243	03_77O_002	NRSC		CH_565	3806	WB	Brahmaputra		China	51	82	80	79	-38
244	02_77D_003	NRSC		CH_258	4364	WB	Ganga	Arun Kosi	China	82	102	82	133	-38
245	03_77D_004	NRSC/S DC	/Very High Risk	SK_4	5287	GL	Brahmaputra	Teesta	India	74	113	122	112	-39
246	03_77P_016	NRSC		CH_587	4749	WB	Brahmaputra	Dangm e Chu	China	161	262	224	227	-39
247	02_71L_034	NRSC	89G	CH_188	5095	GL	Ganga	Sun Kosi	China	42	-	69	55	-39
248	02_63M_002	NRSC		NP_41	112	WB	Ganga	Rapti	Nepal	91	148	107	119	-39

Sl. No.	Lake ID	Inventor y Develop ed by	Rank of Vulnera bility	UID	Elevati on (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
249	03_62O_043	NRSC		CH_388	5285	WB	Brahmaputra		China	50	83	80	73	-40
250	02_72I_007	NRSC	785G	NP_62	4540	GL	Ganga	Sun Kosi	Nepal	42	-	70	67	-40
251	03_71G_009	NRSC		CH_418	5032	WB	Brahmaputra		China	91	155	156	148	-42
252	02_53P_001	NRSC		UK_9	210	WB	Ganga	Ganga	India	1062	1855	1621	1567	-43
253	03_71C_010	NRSC		CH_403	4561	WB	Brahmaputra		China	30	-	54	42	-44
254	02_72E_001	NRSC		NP_57	1554	WB	Ganga	Baghm ati	Nepal	94	165	168	153	-44
255	03_71O_002	NRSC		CH_438	4909	WB	Brahmaputra		China	24	-	49	44	-51
256	01_62B_001	NRSC		CH_73	4526	WB	Indus	Satluj	China	231	472	301	316	-51
257	03_82D_010	NRSC		CH_716	5043	WB	Brahmaputra	Dangm e Chu	China	33	70	49	57	-53
258	02_77D_001	NRSC		CH_256	4423	WB	Ganga	Arun Kosi	China	2030	4849	3677	3583	-58
259	03_77H_007	NRSC		CH_481	4424	WB	Brahmaputra		China	348	823	737	670	-58
260	03_77L_008	NRSC		CH_524	4448	WB	Brahmaputra		China	32	76	80	79	-60
261	03_62O_028	NRSC		CH_373	4577	WB	Brahmaputra		China	360	902	644	635	-60
262	01_61F_004	NRSC		CH_61	4814	WB	Indus	Indus	China	3839	37181	39073	38352	-90

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

Sl. No.	Lake ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of July-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	01_52L_008	NRSC		CH_1	3873	WB	Indus	Satluj	China	#	32	101	78	#
2	03_78I_048	NRSC		BH_129	4169	WB	Brahmaputra	Manas Chu & Mangde Chu	Bhutan	#	52	32	38	#
3	02_72I_025	NRSC	66G	NP_78	4884	GL	Ganga	Sun Kosi	Nepal	#	102	126	111	#
4	01_52J_009	NRSC		JK_205	5576	WB	Indus	Shyok	India	#	61	56	51	#
5	02_72I_014	NRSC	6G	NP_67	4574	GL	Ganga	Sun Kosi	Nepal	#	149	164	163	#
6	01_52K_010	NRSC		JK_218	5313	WB	Indus	Shyok	India	#	148	140	136	#
7	01_52J_001	NRSC	8I	JK_197	5311	GL	Indus	Shyok	India	#	104	96	92	#
8	03_91C_069	NRSC		AP_101	3245	WB	Brahmaputra	Dibang	India	#	72	46	45	#
9	01_52K_011	NRSC		JK_219	5291	WB	Indus	Shyok	India	#	183	175	170	#
10	01_52J_002	NRSC		JK_198	5359	WB	Indus	Shyok	India	#	67	61	59	#
11	01_52J_006	NRSC		JK_202	5401	WB	Indus	Shyok	India	#	107	104	100	#
12	01_52G_003	NRSC		JK_191	4533	WB	Indus	Indus	India	#	1609	1315	1335	#
13	01_62F_003	NRSC		CH_94	4586	WB	Indus	Satluj	China	#	40806	41185	41037	#
14	01_62F_002	NRSC		CH_93	4592	WB	Indus	Satluj	China	#	334	320	316	#

Sl. No.	Lake ID	Inventory Developed by	Rank of Vulnerability	UID	Elevation (m)	Lake Type	Basin	River	Country	Area of July-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 (%)
15	03_71G_007	NRSC		CH_416	5153	WB	Brahmaputra		China	#	188	189	187	#
16	03_77H_020	NRSC		CH_490	4473	WB	Brahmaputra		China	#	4976	4525	4594	#
17	01_62F_001	NRSC		CH_92	4571	WB	Indus	Satluj	China	#	25680	25164	25241	#
18	03_77P_004	NRSC		CH_575	4452	WB	Brahmaputra		China	#	205	216	205	#
19	01_61D_001	NRSC		CH_53	5593	WB	Indus	Indus	China	#	81	76	66	#
20	03_77H_001	NRSC		CH_476	4275	WB	Brahmaputra		China	#	521	353	361	#
21	03_62N_003	NRSC		CH_320	5208	WB	Brahmaputra		China	#	-	46	44	#
22	02_77D_004	NRSC		CH_259	4378	WB	Ganga	Arun Kosi	China	#	1013	802	740	#
23	03_82F_010	NRSC		CH_735	5030	GL	Brahmaputra		China	10	-	-	-	#
24	03_77P_005	NRSC		CH_576	4619	WB	Brahmaputra		China	#	110	95	97	#
25	01_52E_001	NRSC		JK_188	5116	GL	Indus	Shyok	India	#	48	4	19	#
26	01_61C_004	NRSC			4495	WB				#	-	-	-	#
27	03_91C_052	NRSC		CH_1085	4591	WB	Brahmaputra	Luhit	China	#	-	34	38	#

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 6: WATER SPREAD AREA OF CRITICAL GLS IDENTIFIED BY NDMA THROUGH SWISS DEVELOPMENT AGENCY (SDC) FOR INDIAN HIMALAYAN REGION

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	State	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
1	98	SDC	High Risk	GL	4103	JK	India	#	#	#
2	976	SDC	High Risk/15I	GL	4314	JK	India	#	#	#
3	173	SDC	Medium Risk	GL	5150	JK	India	#	7	#
4	2147	SDC	Medium Risk	GL	5688	UK	India	#	0.5	#
5	958	SDC	Very High Risk	GL	4103	JK	India	#	3.33	#
6	993	SDC	Very High Risk	GL	4148	JK	India	#	9	#
7	1774	SDC	Very High Risk	GL	4593	HP	India	#	7	#
8	1936	SDC	Very High Risk/321I	GL	4606	HP	India	#	3	#
9	1998	SDC	Very High Risk	GL	3857	HP	India	#	1	#
10	2031	SDC	Very High Risk	GL	4702	HP	India	#	12	#

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	State	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
11	2299	SDC	Very High Risk	GL	4490	UK	India	#	#	#
12	298	SDC	Very High Risk	GL	4508	SK	India	#	4.67	#
13	599	SDC	Very High Risk	GL	4251	SK	India	#	8	#
14	1805	SDC	Very High Risk/81I	GL	4775	HP	India	6	1.67	259
15	1847	SDC	Very High Risk	GL	4570	HP	India	19	12	58
16	293	SDC	Very High Risk	GL	5048	SK	India	3	2	50
17	180	SDC	Very High Risk	GL	4442	JK	India	12	8.33	44
18	295	SDC	Very High Risk	GL	4850	SK	India	8	6	33
19	1360	SDC	Very High Risk	GL	4667	JK	India	11	9	22
20	2207	SDC	Very High Risk	GL	4707	UK	India	12	10.33	16
21	963	SDC	Medium Risk	GL	3725	JK	India	30	26.67	12
22	292	SDC	Medium Risk	GL	5577	SK	India	4	3.67	9
23	260	SDC	Medium Risk	GL	5253	SK	India	42	39.67	6

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	State	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
24	227	SDC	Very High Risk	GL	5176	SK	India	56	53	6
25	951	SDC	Very High Risk	GL	3762	JK	India	19	18.33	4
26	515	SDC	Medium Risk	GL	5063	SK	India	8	8	0
27	1032	SDC	Very High Risk	GL	4007	JK	India	1	1	0
28	129	SDC	Very High Risk	GL	4895	AP	India	9	9	0
29	237	SDC	Very Low Risk	GL	5322	SK	India	7	7	0
30	312	SDC	Medium Risk	GL	5137	SK	India	8	8.33	-4
31	345	SDC	Medium Risk	GL	5108	SK	India	18	18.67	-4
32	931	SDC	Very High Risk	GL	4082	JK	India	18	18.67	-4
33	2108	SDC	Very High Risk/347G	GL	5587	UK	India	17	18	-6
34	1037	SDC	Medium Risk/27I	GL	3603	JK	India	36	39	-8
35	27	SDC	Very High Risk	GL	3775	JK	India	12	13	-8

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	State	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
36	569	SDC	Medium Risk	GL	5450	SK	India	28	32	-13
37	256	SDC	High risk	GL	4615	SK	India	14	16.33	-14
38	182	SDC	Very High Risk	GL	4304	JK	India	7	8.5	-18
39	938	SDC	Very High Risk	GL	3683	JK	India	17	21	-19
40	1014	SDC	Very High Risk	GL	3989	JK	India	3	4.33	-31

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

- Unobservable (as per NRSC) , #indicates frozen/ dried lakes

TABLE 7: WATER SPREAD AREA OF GLs UPTO 10 HA BUT SMALLER THAN 50 HA PREPARED BY NRSC IN 2009

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
1	01_52P_004	NRSC		GL	5470	Indus	Indus	china	#	#	#
2	01_53M_003	NRSC	110I	GL	5511	Indus	Indus	china	1	#	#
3	03_82F_011	NRSC		GL	4720		Brahmaputra	china	13	#	#
4	03_82O_004	NRSC		GL	4148		Brahmaputra	china	2	#	#
5	03_91C_013	NRSC		GL	4925		Brahmaputra	china	12	#	#
6	03_91H_073	NRSC		GL	4481	Luhit	Brahmaputra	India	33	#	#
7	02_62B_007	NRSC		GL	4839	Sarda	Ganga	India	#	0	#
8	01_52L_007	NRSC	184I	GL	5498	Indus	Indus	India	#	33	#
9	03_82N_032	NRSC		GL	4384		Brahmaputra	china	#	41	#
10	03_82O_003	NRSC		GL	4180		Brahmaputra	china	#	15	#
11	03_91C_008	NRSC		GL	4899		Brahmaputra	china	#	20.5	#
12	01_52B_010	NRSC/SDC	75I/Medium Risk	GL	5122	Indus	Indus	India	#	16.5	#
13	02_71H_019	NRSC	92G	GL	4674	Trisuli	Ganga	china	#	15	#
14	03_91C_036	NRSC		GL	4298		Brahmaputra	china	#	0	#

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
15	03_91D_096	NRSC		GL	3794	Luhit	Brahmaputra	china	#	0	#
16	03_91G_005	NRSC		GL	5170	Luhit	Brahmaputra	china	#	10.5	#
17	03_91G_009	NRSC		GL	4637	Luhit	Brahmaputra	china	#	17.33	#
18	02_71L_016	NRSC	570G	GL	5345	Sun Kosi	Ganga	china	#	9.5	#
19	02_71P_017	NRSC		GL	4194	Arun Kosi	Ganga	china	#	60	#
20	03_77H_005	NRSC		GL	5113		Brahmaputra	china	#	21	#
21	03_77L_040	NRSC		GL	4515	Puna Tsang Chu	Brahmaputra	Bhutan	#	0	#
22	03_77L_054	NRSC		GL	4717	Puna Tsang Chu	Brahmaputra	Bhutan	#	2	#
23	02_72I_028	NRSC	146G	GL	4408	Sun Kosi	Ganga	Nepal	#	25.33	#
24	02_72I_005	NRSC	483G	GL	4715	Sun Kosi	Ganga	Nepal	#	24.5	#
25	02_72M_011	NRSC	86G	GL	4865	Arun Kosi	Ganga	Nepal	#	42.5	#
26	03_78M_013	NRSC		GL	4232	Kuri Chu	Brahmaputra	Bhutan	#	5.5	#
27	02_62F_007	NRSC		GL	5179	Karnal	Ganga	Nepal	23	10.67	116
28	03_91C_023	NRSC		GL	4811	Luhit	Brahmaputra	china	31	16.67	86

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
29	03_82N_016	NRSC		GL	5017		Brahmaputra	china	6	3.67	63
30	03_77L_053	NRSC		GL	4793	Kuri Chu	Brahmaputra	china	44	27	63
31	03_91D_099	NRSC		GL	4406	Luhit	Brahmaputra	china	43	26.5	62
32	03_82F_025	NRSC		GL	4253		Brahmaputra	china	13	8.33	56
33	03_91D_075	NRSC		GL	4274	Dibang	Brahmaputra	India	32	21	52
34	02_62J_001	NRSC		GL	5182	Karnal	Ganga	Nepal	9	6	50
35	03_82F_026	NRSC		GL	4607		Brahmaputra	china	14	10	40
36	03_82J_003	NRSC		GL	4161		Brahmaputra	china	32	23.33	37
37	01_53M_002	NRSC	142I	GL	5468	Indus	Indus	china	10	7.33	36
38	03_82F_021	NRSC		GL	4487		Brahmaputra	china	10	7.67	30
39	03_91H_015	NRSC		GL	4553	Luhit	Brahmaputra	china	13	10	30
40	03_82L_004	NRSC		GL	4441		Brahmaputra	china	15	11.67	29
41	03_77L_063	NRSC		GL	5183	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	23	18	28

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
42	02_71P_030	NRSC	166G	GL	5329	Arun Kosi	Ganga	china	27	21.33	27
43	01_62E_007	NRSC	437I	GL	5641	Satluj	Indus	china	17	13.5	26
44	03_91C_043	NRSC		GL	4429		Brahmaputra	china	13	10.33	26
45	03_82F_023	NRSC		GL	4354		Brahmaputra	china	10	8	25
46	03_71D_003	NRSC		GL	5362		Brahmaputra	china	10	8	25
47	02_71P_020	NRSC		GL	4200	Arun Kosi	Ganga	china	148	118.5	25
48	03_78I_026	NRSC		GL	5233	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	18	14.67	23
49	03_91D_098	NRSC		GL	4197	Luhit	Brahmaputra	china	14	11.5	22
50	02_71P_036	NRSC	54G	GL	5121	Arun Kosi	Ganga	china	46	37.67	22
51	03_82N_018	NRSC		GL	4333		Brahmaputra	china	12	10	20
52	03_82L_008	NRSC		GL	4342		Brahmaputra	china	12	10	20
53	02_71H_034	NRSC	320G	GL	4745	Trisuli	Ganga	Nepal	20	16.67	20
54	02_72I_017	NRSC	49G	GL	5018	Sun Kosi	Ganga	Nepal	10	8.33	20

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
55	02_71P_044	NRSC	557G	GL	5555	Arun Kosi	Ganga	china	10	8.33	20
56	03_91G_004	NRSC		GL	5262	Luhit	Brahmaputra	china	36	30.33	19
57	03_78I_022	NRSC		GL	5048	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	17	14.33	19
58	03_82N_037	NRSC		GL	4691		Brahmaputra	china	13	11	18
59	03_91C_012	NRSC		GL	4663		Brahmaputra	china	20	17	18
60	02_71D_001	NRSC		GL	4111	Trisuli	Ganga	Nepal	26	22	18
61	03_82G_007	NRSC		GL	4994		Brahmaputra	china	13	11	18
62	03_91C_026	NRSC		GL	4305	Dibang	Brahmaputra	India	29	24.5	18
63	01_43J_003	NRSC		GL	3954	Jhelum	Indus	India	16	13.67	17
64	02_71P_041	NRSC	768G	GL	5064	Arun Kosi	Ganga	china	21	18	17
65	03_77L_073	NRSC		GL	5166	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	14	12	17
66	02_71L_018	NRSC	651G	GL	5377	Sun Kosi	Ganga	china	17	14.67	16

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
67	03_78A_025	NRSC		GL	4888	Amo Chu	Brahmaputra		11	9.5	16
68	03_78E_025	NRSC		GL	4341	Puna Tsang Chu	Brahmaputra	Bhutan	17	14.67	16
69	02_53N_001	NRSC	250G	GL	4688	Ganga	Ganga	India	26	22.67	15
70	03_82F_024	NRSC		GL	4197		Brahmaputra	china	22	19.33	14
71	03_71C_004	NRSC		GL	5575		Brahmaputra	china	14	12.33	14
72	03_78I_020	NRSC		GL	5331	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	22	19.33	14
73	02_62B_004	NRSC	232G	GL	4918	Sarda	Ganga	India	24	21.33	13
74	02_62B_005	NRSC	580G	GL	4314	Sarda	Ganga	India	9	8	13
75	03_62K_010	NRSC		GL	5181		Brahmaputra	china	77	68.33	13
76	03_77H_021	NRSC		GL	5135	Puna Tsang Chu	Brahmaputra	Bhutan	15	13.33	13
77	03_77L_065	NRSC		GL	5025	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	17	15	13

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
78	03_78I_025	NRSC		GL	5194	Puna Tsang Chu	Brahmaputra	Bhutan	15	13.33	13
79	02_72I_015	NRSC	814G	GL	5416	Sun Kosi	Ganga	Nepal	48	42.67	12
80	02_62J_002	NRSC		GL	5021	Karnal	Ganga	Nepal	13	11.67	11
81	02_62K_003	NRSC	546G	GL	4571	Karnal	Ganga	Nepal	43	38.67	11
82	03_71C_006	NRSC		GL	5482		Brahmaputra	china	21	19	11
83	01_52L_006	NRSC	306I	GL	5727	Indus	Indus	India	11	10	10
84	01_52A_004	NRSC/SDC	/Very High Risk	GL	4619	Shyok	Indus	India	11	10	10
85	03_77L_022	NRSC		GL	4810	Kuri Chu	Brahmaputra	china	11	10	10
86	02_71H_031	NRSC	78G	GL	5268	Sun Kosi	Ganga	china	30	27.33	10
87	02_71L_008	NRSC	457G	GL	5577	Sun Kosi	Ganga	china	39	35.33	10
88	02_71P_026	NRSC	322G	GL	5340	Arun Kosi	Ganga	china	15	13.67	10
89	03_77L_028	NRSC		GL	4632	Kuri Chu	Brahmaputra	china	14	12.67	10
90	03_78E_001	NRSC		GL	5157	Puna Tsang Chu	Brahmaputra	Bhutan	32	29	10
91	02_71H_004	NRSC		GL	5239	Arun Kosi	Ganga	china	27	24.67	9

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
92	03_78I_001	NRSC		GL	5129	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	8	7.33	9
93	03_78A_017	NRSC		GL	5545	Teesta	Brahmaputra	India	30	27.5	9
94	02_62O_004	NRSC	299G	GL	5529	Kali Gandak	Ganga	Nepal	22	20.33	8
95	03_82L_006	NRSC		GL	4147		Brahmaputra	china	14	13	8
96	02_71L_019	NRSC	323G	GL	5378	Sun Kosi	Ganga	china	13	12	8
97	02_71P_031	NRSC	141G	GL	5395	Arun Kosi	Ganga	china	19	17.67	8
98	02_71L_035	NRSC	657G	GL	5091	Sun Kosi	Ganga	Nepal	14	13	8
99	02_72I_031	NRSC	14G	GL	4777	Sun Kosi	Ganga	Nepal	30	27.67	8
100	02_72I_006	NRSC		GL	4741	Sun Kosi	Ganga	Nepal	19	17.67	8
101	02_78A_006	NRSC	676G	GL	5743	Arun Kosi	Ganga	china	18	16.67	8
102	03_78I_067	NRSC		GL	4918	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	23	21.33	8
103	03_78A_027	NRSC/SDC	/Very High Risk	GL	4888	Teesta	Brahmaputra	India	33	30.67	8
104	03_71B_001	NRSC		GL	5692		Brahmaputra	china	27	25.33	7

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
105	03_62K_005	NRSC		GL	4999		Brahmaputra	china	24	22.33	7
106	03_91C_019	NRSC		GL	3858		Brahmaputra	china	53	49.67	7
107	02_71P_032	NRSC	564G	GL	5190	Arun Kosi	Ganga	china	20	18.67	7
108	03_78I_038	NRSC		GL	5143	Puna Tsang Chu	Brahmaputra	Bhutan	10	9.33	7
109	03_78I_054	NRSC		GL	5138	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	16	15	7
110	02_62G_003	NRSC	589G	GL	3603	Karnal	Ganga	Nepal	35	33	6
111	02_71H_009	NRSC		GL	5448	Arun Kosi	Ganga	china	24	22.67	6
112	03_62K_006	NRSC		GL	5101		Brahmaputra	china	27	25.5	6
113	02_72M_014	NRSC	47G	GL	5217	Tamur Kosi	Ganga	Nepal	23	21.67	6
114	03_78A_026	NRSC		GL	4736	Teesta	Brahmaputra	India	12	11.33	6
115	03_83A_003	NRSC		GL	5188	Dangme Chu	Brahmaputra	India	87	82	6
116	03_78A_019	NRSC/SDC	/Very High Risk	GL	4809	Teesta	Brahmaputra	India	12	11.33	6

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
117	03_82F_001	NRSC		GL	4822		Brahmaputra	china	15	14.33	5
118	03_82J_001	NRSC		GL	4775		Brahmaputra	china	29	27.67	5
119	03_91C_010	NRSC		GL	4712		Brahmaputra	china	22	21	5
120	03_62O_045	NRSC		GL	5566		Brahmaputra	china	10	9.5	5
121	03_71P_002	NRSC		GL	5537		Brahmaputra	china	15	14.33	5
122	02_71L_020	NRSC	156G	GL	5348	Sun Kosi	Ganga	china	29	27.67	5
123	02_71L_009	NRSC	520G	GL	5546	Arun Kosi	Ganga	china	33	31.33	5
124	03_77L_038	NRSC		GL	5521		Brahmaputra	china	14	13.33	5
125	03_77L_071	NRSC		GL	5228	Puna Tsang Chu	Brahmaputra	Bhutan	22	21	5
126	03_78E_003	NRSC		GL	5152	Puna Tsang Chu	Brahmaputra	Bhutan	23	22	5
127	03_78I_040	NRSC		GL	5167	Puna Tsang Chu	Brahmaputra	Bhutan	21	20	5
128	02_62F_011	NRSC	362G	GL	5524	Karnal	Ganga	china	27	26	4
129	03_71C_001	NRSC		GL	5543		Brahmaputra	china	8	7.67	4

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
130	03_91C_035	NRSC		GL	4283		Brahmaputra	china	57	55	4
131	03_77L_057	NRSC		GL	4897	Kuri Chu	Brahmaputra		46	44.33	4
132	02_71P_048	NRSC	283G	GL	5094	Arun Kosi	Ganga	china	19	18.33	4
133	03_78I_058	NRSC		GL	5041	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	27	26	4
134	03_82F_012	NRSC		GL	4454		Brahmaputra	china	20	19.33	3
135	01_53I_002	NRSC/SDC	26I/Very High Risk	GL	4273	Satluj	Indus	India	31	30	3
136	02_62O_002	NRSC	410G	GL	5495	Kali Gandak	Ganga	Nepal	22	21.33	3
137	02_71H_016	NRSC		GL	5305	Arun Kosi	Ganga	china	26	25.33	3
138	03_77H_022	NRSC		GL	4936		Brahmaputra	china	20	19.33	3
139	02_71L_030	NRSC	242G	GL	5242	Sun Kosi	Ganga	china	22	21.33	3
140	02_72I_001	NRSC	198G	GL	5333	Sun Kosi	Ganga	Nepal	13	12.67	3
141	03_78A_031	NRSC		GL	4305	Teesta	Brahmaputra	India	12	11.67	3
142	03_78E_008	NRSC		GL	5045	Puna Tsang Chu	Brahmaputra	Bhutan	11	10.67	3

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
143	02_71H_011	NRSC	775G	GL	4509	Trisuli	Ganga	china	29	28.5	2
144	03_62O_035	NRSC		GL	5256		Brahmaputra	china	32	31.33	2
145	03_82C_011	NRSC		GL	5242		Brahmaputra	china	15	14.67	2
146	03_82K_109	NRSC		GL	4356		Brahmaputra	china	21	20.67	2
147	03_82L_007	NRSC		GL	4163	Ding	Brahmaputra	India	16	15.67	2
148	02_71P_033	NRSC		GL	4888	Arun Kosi	Ganga	china	20	19.67	2
149	02_77D_010	NRSC	590G	GL	5127	Arun Kosi	Ganga	china	38	37.33	2
150	03_62J_027	NRSC		GL	4781		Brahmaputra	china	23	22.67	1
151	03_82F_009	NRSC		GL	4712		Brahmaputra	china	24	23.67	1
152	02_71H_006	NRSC		GL	5167	Arun Kosi	Ganga	china	35	34.67	1
153	03_71D_002	NRSC		GL	5574		Brahmaputra	china	36	35.67	1
154	03_82G_004	NRSC		GL	4498		Brahmaputra	china	31	30.67	1
155	03_91D_082	NRSC		GL	4550	Luhit	Brahmaputra	china	35	34.67	1
156	03_77L_048	NRSC		GL	4792	Kuri Chu	Brahmaputra	china	26	25.67	1

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
157	02_72I_012	NRSC	113G	GL	4409	Sun Kosi	Ganga	Nepal	41	40.67	1
158	03_78I_057	NRSC		GL	5060	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	45	44.67	1
159	02_62B_006	NRSC	495G	GL	5106	Karnal	Ganga	china	42	42	0
160	02_62F_013	NRSC	256G	GL	5252	Karnal	Ganga	china	45	45	0
161	01_42H_002	NRSC	162I	GL	2763	Gilgit	Indus	India	16	16	0
162	01_62E_016	NRSC	270I	GL	5528	Satluj	Indus	china	20	20	0
163	03_62J_004	NRSC		GL	5556		Brahmaputra	china	15	15	0
164	03_62J_025	NRSC		GL	5362		Brahmaputra	china	21	21	0
165	03_82F_005	NRSC		GL	4762		Brahmaputra	china	44	44	0
166	03_82F_018	NRSC		GL	4554		Brahmaputra	china	17	17	0
167	03_82N_011	NRSC		GL	4997		Brahmaputra	china	21	21	0
168	03_82N_015	NRSC		GL	5090		Brahmaputra	china	5	5	0
169	03_82N_025	NRSC		GL	4764		Brahmaputra	china	24	24	0
170	03_82O_002	NRSC		GL	4198		Brahmaputra	china	19	19	0
171	03_91C_006	NRSC		GL	5057		Brahmaputra	china	4	4	0

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
172	02_62O_005	NRSC	609G	GL	5450	Kali Gandak	Ganga	Nepal	13	13	0
173	02_62P_001	NRSC	258G	GL	4472	Bheri	Ganga	Nepal	45	45	0
174	03_62K_007	NRSC		GL	4911		Brahmaputra	china	29	29	0
175	03_71C_002	NRSC		GL	5663		Brahmaputra	china	9	9	0
176	03_91D_070	NRSC		GL	4126	Luhit	Brahmaputra	china	16	16	0
177	02_71L_014	NRSC	240G	GL	5364	Sun Kosi	Ganga	china	16	16	0
178	02_71L_027	NRSC	433G	GL	5234	Sun Kosi	Ganga	china	18	18	0
179	02_71P_023	NRSC	124G	GL	5235	Arun Kosi	Ganga	china	19	19	0
180	02_71P_038	NRSC	586G	GL	5483	Arun Kosi	Ganga	china	27	27	0
181	03_77H_009	NRSC		GL	5150		Brahmaputra	china	15	15	0
182	03_77L_075	NRSC		GL	4718	Manas Chu &MangdeChu	Brahmaputra	Bhutan	18	18	0
183	03_78I_009	NRSC		GL	5108	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	26	26	0
184	02_71L_033	NRSC	408G	GL	5369	Sun Kosi	Ganga	Nepal	15	15	0
185	02_72I_010	NRSC	263G	GL	5125	Sun Kosi	Ganga	Nepal	14	14	0

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
186	02_72M_003	NRSC	823G	GL	5608	Arun Kosi	Ganga	china	18	18	0
187	02_78A_007	NRSC	429G	GL	5618	TamurKosi	Ganga	Nepal	15	15	0
188	03_83A_005	NRSC		GL	4994	Dangme Chu	Brahmaputra	India	12	12	0
189	03_78I_015	NRSC		GL	5116	Puna Tsang Chu	Brahmaputra	Bhutan	15	15	0
190	01_52C_002	NRSC	46I	GL	4092	Chenab	Indus	India	43	43.33	-1
191	03_62J_028	NRSC		GL	5603		Brahmaputra	china	42	42.33	-1
192	03_77J_001	NRSC		GL	5354		Brahmaputra	china	24	24.33	-1
193	03_91C_002	NRSC		GL	4691		Brahmaputra	china	33	33.5	-1
194	03_71P_003	NRSC		GL	5360		Brahmaputra	china	28	28.33	-1
195	03_77K_002	NRSC		GL	5154		Brahmaputra	china	37	37.33	-1
196	02_71H_032	NRSC		GL	5116	Sun Kosi	Ganga	china	25	25.33	-1
197	02_71H_023	NRSC		GL	5595	Arun Kosi	Ganga	china	59	59.33	-1
198	02_71L_029	NRSC	747G	GL	5237	Arun Kosi	Ganga	china	45	45.33	-1
199	03_78A_010	NRSC		GL	5078	Teesta	Brahmaputra	India	33	33.33	-1

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
200	03_62K_013	NRSC		GL	5101		Brahmaputra	china	46	47	-2
201	02_62F_015	NRSC	59G	GL	5359	Karnal	Ganga	china	28	28.67	-2
202	01_52H_003	NRSC		GL	4165	Chenab	Indus	India	158	160.67	-2
203	03_82N_035	NRSC		GL	4479		Brahmaputra	china	20	20.5	-2
204	03_82O_001	NRSC		GL	4348		Brahmaputra	china	41	41.67	-2
205	03_91H_008	NRSC		GL	4755	Luhit	Brahmaputra	china	45	46	-2
206	02_71H_036	NRSC	195G	GL	5024	Trisuli	Ganga	Nepal	13	13.33	-2
207	02_71H_030	NRSC	598G	GL	5411	Sun Kosi	Ganga	china	13	13.33	-2
208	02_71H_022	NRSC		GL	5735	Arun Kosi	Ganga	china	19	19.33	-2
209	02_71L_017	NRSC	179G	GL	5211	Sun Kosi	Ganga	china	13	13.33	-2
210	03_77L_058	NRSC		GL	5016	Kuri Chu	Brahmaputra		32	32.67	-2
211	03_83A_004	NRSC		GL	5109	Dangme Chu	Brahmaputra	India	16	16.33	-2
212	01_62F_007	NRSC		GL	5344	Satluj	Indus	china	21	21.67	-3
213	01_62J_004	NRSC	446I	GL	5504	Satluj	Indus	china	10	10.33	-3
214	03_91C_071	NRSC		GL	4339	Dibang	Brahmaputra	china	33	34	-3
215	03_77L_049	NRSC		GL	4716	Puna Tsang Chu	Brahmaputra	Bhutan	33	34	-3

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
216	03_78I_004	NRSC		GL	5194	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	26	26.67	-3
217	02_71L_031	NRSC	52G	GL	4682	Sun Kosi	Ganga	china	29	30	-3
218	02_72M_004	NRSC	336G	GL	5293	Arun Kosi	Ganga	china	50	51.67	-3
219	02_78A_008	NRSC	199G	GL	5032	TamurKosi	Ganga	Nepal	24	24.67	-3
220	03_78E_018	NRSC		GL	5164		Brahmaputra	china	18	18.5	-3
221	03_78A_016	NRSC		GL	5451	Teesta	Brahmaputra	India	11	11.33	-3
222	03_82N_001	NRSC		GL	5055		Brahmaputra	china	33	34.33	-4
223	02_71H_014	NRSC		GL	4458	Trisuli	Ganga	china	8	8.33	-4
224	02_71L_025	NRSC	154G	GL	5357	Sun Kosi	Ganga	china	18	18.67	-4
225	03_78I_005	NRSC		GL	5338	Puna Tsang Chu	Brahmaputra	Bhutan	43	44.67	-4
226	02_72I_013	NRSC	694G	GL	5497	Sun Kosi	Ganga	Nepal	17	17.67	-4
227	03_83A_007	NRSC		GL	5028	Jia Brali	Brahmaputra	India	15	15.67	-4
228	03_78A_007	NRSC/SDC	/Very High Risk	GL	4977	Teesta	Brahmaputra	India	16	16.67	-4
229	02_62G_002	NRSC	599G	GL	4822	Karnal	Ganga	Nepal	18	19	-5

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
230	02_71L_007	NRSC	572G	GL	5576	Arun Kosi	Ganga	china	12	12.67	-5
231	03_77L_078	NRSC		GL	5296	Puna Tsang Chu	Brahmaputra	Bhutan	14	14.67	-5
232	01_52A_003	NRSC		GL	4586	Shyok	Indus	India	20	21.33	-6
233	03_62J_003	NRSC		GL	5553		Brahmaputra	china	10	10.67	-6
234	03_82J_006	NRSC		GL	3657		Brahmaputra	china	53	56.33	-6
235	03_82N_031	NRSC		GL	4409		Brahmaputra	china	15	16	-6
236	03_71P_004	NRSC		GL	5637		Brahmaputra	china	10	10.67	-6
237	03_91G_007	NRSC		GL	4785	Luhit	Brahmaputra	china	11	11.67	-6
238	03_77L_039	NRSC		GL	5457	Kuri Chu	Brahmaputra	china	40	42.33	-6
239	03_77L_047	NRSC		GL	4364	Puna Tsang Chu	Brahmaputra	Bhutan	40	42.67	-6
240	03_77L_079	NRSC		GL	5386	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	33	35	-6
241	03_78A_023	NRSC		GL	4547	Teesta	Brahmaputra	India	27	28.67	-6

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
242	02_62F_006	NRSC		GL	5444	Karnal	Ganga	Nepal	14	15	-7
243	03_82N_008	NRSC		GL	4546		Brahmaputra	china	32	34.33	-7
244	03_91C_004	NRSC		GL	4137		Brahmaputra	china	17	18.33	-7
245	02_62K_011	NRSC	612G	GL	4673	Bheri	Ganga	Nepal	27	29	-7
246	03_62O_031	NRSC		GL	5381		Brahmaputra	china	29	31.33	-7
247	02_71L_005	NRSC	282G	GL	5524	Arun Kosi	Ganga	china	17	18.33	-7
248	02_71L_022	NRSC	715G	GL	5554	Arun Kosi	Ganga	china	25	27	-7
249	02_71P_042	NRSC	654G	GL	5524	Arun Kosi	Ganga	china	19	20.33	-7
250	03_77H_015	NRSC		GL	4801		Brahmaputra	china	13	14	-7
251	03_83A_001	NRSC		GL	5018		Brahmaputra	china	44	47.33	-7
252	03_78A_015	NRSC/SDC	/Medium Risk	GL	4970	Teesta	Brahmaputra	India	9	9.67	-7
253	01_61B_002	NRSC	345I	GL	5722	Indus	Indus	china	24	26	-8
254	02_71H_010	NRSC		GL	5481	Arun Kosi	Ganga	china	23	25	-8
255	03_91H_007	NRSC		GL	4635	Luhit	Brahmaputra	china	29	31.5	-8

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
256	03_77L_045	NRSC		GL	5224	Kuri Chu	Brahmaputra	china	30	32.67	-8
257	02_72I_008	NRSC	99G	GL	5040	Sun Kosi	Ganga		33	36	-8
258	02_72I_020	NRSC	763G	GL	5436	Sun Kosi	Ganga	Nepal	19	20.67	-8
259	02_77D_011	NRSC	393G	GL	5305	Arun Kosi	Ganga	china	42	45.67	-8
260	03_78I_036	NRSC		GL	5028	Puna Tsang Chu	Brahmaputra	Bhutan	11	12	-8
261	03_78I_043	NRSC		GL	5000	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	19	20.67	-8
262	03_78A_008	NRSC		GL	4998	Teesta	Brahmaputra	India	17	18.67	-9
263	03_77L_019	NRSC		GL	5681		Brahmaputra	china	13	14.33	-9
264	03_91H_033	NRSC		GL	4389	Luhit	Brahmaputra	china	10	11	-9
265	02_71H_024	NRSC	155G	GL	4890	Trisuli	Ganga	china	24	26.33	-9
266	02_71P_024	NRSC	576G	GL	5273	Arun Kosi	Ganga	china	20	22	-9
267	02_71P_039	NRSC	396G	GL	5489	Arun Kosi	Ganga	china	17	18.67	-9

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
268	03_78I_046	NRSC		GL	5168	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	20	22	-9
269	01_52B_012	NRSC	129I	GL	5137	Indus	Indus	India	13	14.5	-10
270	01_52C_001	NRSC	11I	GL	4394	Shingo (Indus)	Indus	India	50	55.33	-10
271	03_62J_010	NRSC		GL	5571		Brahmaputra	china	22	24.33	-10
272	03_62J_024	NRSC		GL	5548		Brahmaputra	china	18	20	-10
273	03_77J_002	NRSC		GL	5254		Brahmaputra	china	9	10	-10
274	03_82N_034	NRSC		GL	4181		Brahmaputra	china	13	14.5	-10
275	03_91C_003	NRSC		GL	4703		Brahmaputra	china	28	31	-10
276	03_77K_003	NRSC		GL	5303		Brahmaputra	china	9	10	-10
277	03_91C_021	NRSC		GL	4093		Brahmaputra	china	27	30	-10
278	02_71L_012	NRSC	96G	GL	5570	Sun Kosi	Ganga	china	19	21	-10
279	03_77H_026	NRSC		GL	5233		Brahmaputra	china	9	10	-10
280	03_77L_036	NRSC		GL	5810	Kuri Chu	Brahmaputra	china	21	23.33	-10

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
281	03_77L_082	NRSC		GL	5019	Puna Tsang Chu	Brahmaputra	Bhutan	12	13.33	-10
282	02_78A_001	NRSC	498G	GL	5201	Arun Kosi	Ganga	china	20	22.33	-10
283	02_78A_002	NRSC	668G	GL	5397	Arun Kosi	Ganga	china	12	13.33	-10
284	02_72M_001	NRSC	737G	GL	5675	Arun Kosi	Ganga	china	6	6.67	-10
285	03_78I_064	NRSC		GL	4976	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	18	20	-10
286	03_82N_029	NRSC		GL	4492		Brahmaputra	china	38	42.5	-11
287	03_77L_062	NRSC		GL	5295	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	42	47.33	-11
288	03_77D_007	NRSC/SDC	/Very High Risk	GL	5015	Teesta	Brahmaputra	India	22	24.67	-11
289	01_62B_002	NRSC	381I	GL	4998	Satluj	Indus	china	17	19.33	-12
290	01_62B_003	NRSC	86I	GL	5288	Satluj	Indus	India	11	12.5	-12
291	03_71D_001	NRSC		GL	5454		Brahmaputra	china	15	17	-12
292	03_91H_001	NRSC		GL	4429	Luhit	Brahmaputra	china	15	17	-12

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
293	03_91H_034	NRSC		GL	4629	Luhit	Brahmaputra	china	12	13.67	-12
294	03_77H_029	NRSC		GL	5049	Puna Tsang Chu	Brahmaputra	Bhutan	19	21.67	-12
295	02_72I_019	NRSC	757G	GL	5510	Sun Kosi	Ganga	Nepal	15	17	-12
296	02_72I_022	NRSC	287G	GL	5344	Sun Kosi	Ganga	Nepal	27	30.67	-12
297	03_78E_011	NRSC		GL	4952	Puna Tsang Chu	Brahmaputra	Bhutan	17	19.33	-12
298	01_52A_002	NRSC		GL	4537	Shyok	Indus	India	18	20.67	-13
299	03_77L_023	NRSC		GL	5489	Kuri Chu	Brahmaputra	china	26	30	-13
300	03_78I_008	NRSC		GL	5252	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	11	12.67	-13
301	03_78A_020	NRSC		GL	5219	Teesta	Brahmaputra	India	13	15	-13
302	02_62F_009	NRSC	536G	GL	5586	Karnal	Ganga	china	8	9.33	-14
303	03_62K_011	NRSC		GL	5136		Brahmaputra	china	39	45.33	-14
304	02_77D_005	NRSC	499G	GL	5738	Arun Kosi	Ganga	china	6	7	-14
305	03_77H_010	NRSC		GL	5518		Brahmaputra	china	12	14	-14

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
306	03_77H_024	NRSC		GL	4369	Puna Tsang Chu	Brahmaputra	Bhutan	40	46.33	-14
307	02_71P_046	NRSC	317G	GL	4898	Arun Kosi	Ganga	china	24	28	-14
308	03_78A_004	NRSC		GL	5456		Brahmaputra	china	20	23.33	-14
309	02_62K_001	NRSC	329G	GL	4404	Karnal	Ganga	Nepal	24	28.33	-15
310	02_71H_005	NRSC		GL	5010	Arun Kosi	Ganga	china	64	75	-15
311	03_91G_006	NRSC		GL	5028	Luhit	Brahmaputra	china	19	22.33	-15
312	02_71L_015	NRSC	284G	GL	5261	Sun Kosi	Ganga	china	19	22.33	-15
313	03_78I_011	NRSC		GL	5239	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	19	22.33	-15
314	03_78A_012	NRSC		GL	5130	Teesta	Brahmaputra	India	25	29.33	-15
315	03_77D_006	NRSC/SDC	/Very High Risk	GL	5084	Teesta	Brahmaputra	India	19	22.33	-15
316	03_91H_006	NRSC		GL	4620	Luhit	Brahmaputra	china	14	16.67	-16
317	02_72I_021	NRSC	764G	GL	5276	Sun Kosi	Ganga	Nepal	17	20.33	-16
318	02_72M_012	NRSC	69G	GL	4932	TamurKosi	Ganga	Nepal	14	16.67	-16

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
319	03_62K_008	NRSC		GL	4968		Brahmaputra	china	37	44.33	-17
320	03_78I_019	NRSC		GL	5224	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	20	24	-17
321	03_62J_020	NRSC		GL	5603		Brahmaputra	china	12	14.67	-18
322	02_72M_008	NRSC	376G	GL	4722	TamurKosi	Ganga	Nepal	31	37.67	-18
323	03_78A_002	NRSC/SDC	/Very High Risk	GL	4952	Teesta	Brahmaputra	India	33	40	-18
324	03_78A_035	NRSC		GL	4998	Teesta	Brahmaputra	India	7	8.67	-19
325	02_71H_018	NRSC	123G	GL	4787	Trisuli	Ganga	china	25	31.33	-20
326	03_91H_036	NRSC		GL	4457	Luhit	Brahmaputra	china	17	21.33	-20
327	03_78I_006	NRSC		GL	5158	Puna Tsang Chu	Brahmaputra	Bhutan	17	21.33	-20
328	03_78E_027	NRSC		GL	4808	Puna Tsang Chu	Brahmaputra	Bhutan	15	18.67	-20
329	03_78I_028	NRSC		GL	4792	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	16	20	-20

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
330	02_71H_013	NRSC	172G	GL	4446	Trisuli	Ganga	china	13	16.5	-21
331	03_77H_017	NRSC		GL	4537	Puna Tsang Chu	Brahmaputra	Bhutan	20	25.33	-21
332	02_71D_003	NRSC	67G	GL	3668	Trisuli	Ganga	Nepal	20	25.67	-22
333	02_71H_020	NRSC		GL	5354	Arun Kosi	Ganga	china	57	72.67	-22
334	03_77L_020	NRSC		GL	4682	Kuri Chu	Brahmaputra	china	7	9	-22
335	03_78E_016	NRSC		GL	5004		Brahmaputra	china	13	16.67	-22
336	02_62F_010	NRSC		GL	5502	Karnal	Ganga	Nepal	8	10.33	-23
337	03_91C_016	NRSC		GL	4813		Brahmaputra	china	10	13	-23
338	02_72I_024	NRSC	358G	GL	5165	Sun Kosi	Ganga	Nepal	22	28.67	-23
339	02_72I_018	NRSC	776G	GL	5370	Sun Kosi	Ganga	Nepal	26	33.67	-23
340	03_78A_006	NRSC		GL	5004	Teesta	Brahmaputra	India	11	14.33	-23
341	01_53M_001	NRSC	33I	GL	5576	Indus	Indus	china	14	18.5	-24
342	03_77H_016	NRSC		GL	4929		Brahmaputra	china	31	40.67	-24
343	03_77H_025	NRSC		GL	4312	Puna Tsang Chu	Brahmaputra	Bhutan	18	23.67	-24
344	03_77L_031	NRSC		GL	4698	Kuri Chu	Brahmaputra	china	14	18.33	-24

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
345	02_62F_014	NRSC	236G	GL	5481	Karnal	Ganga	china	5	6.67	-25
346	02_62F_016	NRSC	591G	GL	5359	Karnal	Ganga	Nepal	11	14.67	-25
347	03_82G_003	NRSC		GL	4936		Brahmaputra	china	13	17.33	-25
348	03_77L_061	NRSC		GL	5038	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	13	17.33	-25
349	02_72M_013	NRSC	518G	GL	5233	Arun Kosi	Ganga	Nepal	9	12	-25
350	02_72M_015	NRSC	115G	GL	4969	TamurKosi	Ganga	Nepal	10	13.33	-25
351	02_71H_025	NRSC	464G	GL	5303	Trisuli	Ganga	china	14	19	-26
352	02_72I_016	NRSC	739G	GL	5231	Sun Kosi	Ganga	Nepal	21	28.67	-27
353	03_78I_037	NRSC		GL	5159	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	11	15	-27
354	03_78I_072	NRSC		GL	4788	Manas Chu &Mangde Chu	Brahmaputra	Bhutan	9	12.33	-27
355	03_78A_030	NRSC		GL	4447	Amo Chu	Brahmaputra		11	15.33	-28
356	03_77L_056	NRSC		GL	4963	Kuri Chu	Brahmaputra	china	10	14	-29

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
357	03_78I_065	NRSC		GL	4668	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	9	12.67	-29
358	03_91C_007	NRSC		GL	4817		Brahmaputra	china	7	10	-30
359	03_91G_003	NRSC		GL	5018	Luhit	Brahmaputra	china	14	20	-30
360	02_71L_024	NRSC	245G	GL	5263	Sun Kosi	Ganga	china	18	26	-31
361	03_77L_034	NRSC		GL	5500	Kuri Chu	Brahmaputra	china	15	21.67	-31
362	02_72I_009	NRSC		GL	5292	Sun Kosi	Ganga	Nepal	12	17.33	-31
363	03_78A_011	NRSC		GL	5168	Amo Chu	Brahmaputra	china	11	16	-31
364	03_91H_003	NRSC		GL	4439	Luhit	Brahmaputra	china	9	13.33	-32
365	02_62K_006	NRSC	70G	GL	5053	Karnal	Ganga	Nepal	20	30	-33
366	03_78I_014	NRSC		GL	5087	Puna Tsang Chu	Brahmaputra	Bhutan	13	19.33	-33
367	03_77H_027	NRSC		GL	4927		Brahmaputra	china	14	22	-36
368	03_62J_009	NRSC		GL	5624		Brahmaputra	china	15	23.67	-37

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
369	03_77L_074	NRSC		GL	5324	Manas Chu & Mangde Chu	Brahmaputra	Bhutan	11	17.33	-37
370	03_77J_005	NRSC		GL	5766		Brahmaputra	china	8	13	-38
371	02_62F_008	NRSC		GL	5620	Karnal	Ganga	Nepal	5	8.33	-40
372	02_71L_021	NRSC	438G	GL	5373	Sun Kosi	Ganga	china	10	17	-41
373	03_91C_015	NRSC		GL	4421		Brahmaputra	china	12	21	-43
374	03_91G_001	NRSC		GL	5147		Brahmaputra	china	5	9	-44
375	02_71D_002	NRSC		GL	4063	Trisuli	Ganga	Nepal	3	5.33	-44
376	03_78A_005	NRSC		GL	5201	Teesta	Brahmaputra	India	7	12.67	-45
377	02_72I_030	NRSC	480G	GL	4624	Sun Kosi	Ganga	Nepal	4	7.67	-48
378	03_77L_025	NRSC		GL	5370	Kuri Chu	Brahmaputra	china	8	16	-50
379	02_71P_034	NRSC	726G	GL	5259	Arun Kosi	Ganga	china	11	23	-52
380	02_71P_001	NRSC		GL	5498	Arun Kosi	Ganga	china	8	18	-56
381	03_77H_032	NRSC		GL	5056		Brahmaputra	china	4	9	-56

Sl.No.	Lake ID	Inventory Developed by	Rank of Vulnerability	Lake Type	Elevation	River	Basin	Country	Area of July 2023 (ha)	Base Area (Avg area of year 2022) (ha)	Max Change in Area (%)
382	03_77H_019	NRSC		GL	4804	Puna Tsang Chu	Brahmaputra	Bhutan	3	7.67	-61
383	03_82F_013	NRSC		GL	4761		Brahmaputra	china	3	8.67	-65
384	02_72I_026	NRSC	112G	GL	5188	Sun Kosi	Ganga	Nepal	10	29.33	-66
385	01_62F_009	NRSC	387I	GL	5712	Satluj	Indus	china	4	20.33	-80

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

