National Water Resources Inventory Report

(A Comprehensive Assessment and Mapping of Water Sources in Paro and Thimphu Dzongkhags)

Water Resources Management Division
Department of Water
Ministry of Energy and Natural Resources

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Abbreviations/Acronyms

DoFPS	Department of Forests and Park Services
DoW	Department of Water
FYP	Five Year Plan
GIS	Geographic Information System
GNH	Gross National Happiness
GPS	Global Positioning System
MoENR	Ministry of Energy and Natural Resources
PVC	Poly Vinly Chloride
QGIS	Quantum Geographic Information System
SDG	Sustainable Development Goal
SNV	*Stichting Nederlandse Vrijwilligers* ("Foundation of Netherlands Volunteers")
TDS	Total Dissolved Solids
UN	United Nations
WRI	Water Resources Inventory
WRMD	Water Resources Management Division
WRPMD	Water Resources Planning and Monitoring Division
WSD	Water Services Division

Foreword

I am honoured to present this report, *National Water Resources Inventory Report (A Comprehensive Assessment and Mapping of Water Sources in Paro and Thimphu Dzongkhags)*, which is an advancement of Bhutan's ongoing efforts to understand, manage, and safeguard our water resources. This report provides a comprehensive information on the water resources in Paro and Thimphu Dzongkhags. The Water Resources Inventory is an activity of national priority carried out in phases starting with Paro and Thimphu ultimately covering all 20 Dzongkhags by the end of 13th Five-Year Plan. This report builds upon the findings of the report on *Assessment and Mapping of Water Sources in Bhutan, 2021*.

Bhutan remains a water-abundant country, with an estimated 70,576 million cubic meters of renewable freshwater available annually. This translates to approximately 94,500 cubic meters per capita per year, among the highest in the world. Despite this natural abundance, Bhutan continues to face significant challenges in ensuring equitable and reliable access to clean water for all. Climate change, deforestation, land-use changes, and population growth are exerting increasing pressure on our water resources. Rural and highland communities remain vulnerable to seasonal water scarcity, particularly during the dry season, while urban centers are experiencing increasing demand, ageing infrastructure, and distribution inefficiencies despite 99.9% households having access to improved water source. Moreover, the retreat of glaciers and increasingly erratic precipitation patterns pose long-term threats to water security. These challenges are not unique to Bhutan, with more than two billion people globally facing water insecurity while the frequency and severity of climate-induced droughts, floods, and contamination events continue to rise. The United Nations warns that by 2030; the world could face a 40% shortfall in freshwater resources should current trends persist. In this context, our work to assess, manage, and safeguard Bhutan's water resources is timely and critical.

I take this opportunity to extend my sincere appreciation to all officials of the Department of Water, Department of Forests and Park Services, Local Government, and developmental partners for their unwavering support and collaboration. As we move forward, this report not only serve as a record but also as a guide in informed decision-making processes to secure Bhutan's water future.

Dechen Yangden
Director
Department of Water

ACKNOWLEDGEMENT

The Water Resources Inventory in Paro and Thimphu Dzongkhags was coordinated by the Water Resources Management Division (WRMD) with support from the Water Resources Planning and Monitoring Division (WRPMD) and the Water Services Division (WSD) of the Department of Water (DoW).

The DoW extends its sincere gratitude to the Hon'ble Minister and Secretary of the Ministry of Energy and Natural Resources for their leadership and guidance. The Department is highly indebted to the Director of the Department of Forests and Park Services, Chief Forestry Officers of Jigme Dorji National Park, Wangduephodrang Forest Division, Thimphu Forest Division, Paro Forest Division, Gedu Forest Division, Jigme Khesar Strict Nature Reserve for their unwavering support in providing the required manpower to make the inventory successful. The Department is grateful to the local governments of Paro and Thimphu Dzongkhags for their kind support and logistics arrangements.

We express our gratitude to the Royal Government of Bhutan for providing financial support. Additionally, we acknowledge the Adaptation Fund Project and the SNV Bhutan Office for their complementary fund support. This additional support was helpful in ensuring the successful completion of the Water Resources Inventory in Paro and Thimphu Dzongkhags.

1. BACKGROUND

Water is one of the most fundamental natural resources, essential for sustaining life, supporting livelihoods, and maintaining ecological balance. Despite covering 71% of the Earth's surface, only 3% of the total water is available as freshwater out of which only 0.06% is accessible for human use while the rest comprises of frozen polar ice cap or glaciers, groundwater, and swam (Musie & Gonfa, 2023). The United Nations (UN) reports that more than 2 billion people currently live in regions experiencing high water stress, and by 2025, an estimated 50% of the global population will face water scarcity challenges. These alarming figures underscore the critical need for comprehensive and localized water resource inventories to guide sustainable management of water resources.

Bhutan, known for its abundant natural water reserves, plays a significant role in regional hydrology, with five major river basins-Amochhu, Wangchhu, Punatsangchhu, Mangdechhu and Drangmechhu-draining the country. With an estimated per capita water availability of 94,500 cubic meters annually, Bhutan is considered a water-rich nation. However, localized water scarcity is increasingly evident in the country. Factors contributing to the scarcity of water include inaccessibility of water due to steep geographical terrain, increasing water demand, climate change, aging water infrastructure, inefficient water management practices and land use changes.

In response to the growing concerns over water scarcity issues, the Department of Water (DoW) has initiated the Water Resources Inventory (WRI), which is a national priority activity, for informed planning and decision making in water resources management in the country. The WRI will contribute to Bhutan’s broader development and sustainability goals, including advancing Gross National Happiness (GNH), enhancing climate resilience and adaptation strategies, aligning with Sustainable Development Goal (SDG) 6-Clean Water and Sanitation. With comprehensive and accurate water data, Bhutan will be better equipped to ensure long-term water security, ecological sustainability, and equitable resource distribution for current and future generations.

Starting with Paro and Thimphu Dzongkhags during the 2024-2025 fiscal year, this initiative aims to progressively cover all 20 Dzongkhags by the end of the 13th Five Year Plan (FYP). Paro and Thimphu Dzongkhags were prioritized for the inventory because they serve as key regional development centers and major economic hubs in Bhutan. Thimphu is the capital and largest urban center with the highest population while Paro is an important cultural and economic center, and both continues to expand rapidly. These Dzongkhags are experiencing growing demand for water driven by domestic needs, agriculture, and a thriving tourism industry.

This WRI report provides a comprehensive assessment of the current status of water sources, types, availability, quality, and uses in Paro and Thimphu Dzongkhags. It also highlights the condition of watersheds at the micro level (water source), types of infrastructures and presence of biodiversity at the sources. The methodology employed herein will be systematically replicated across the remaining 18 Dzongkhags.

The assessment and mapping of water sources report done in 2021 recorded 237 waters sources in Paro Dzongkhag and 145 in Thimphu Dzongkhag. This WRI validated the results obtained from the 2021 assessment and also recorded the additional sources.

2. OBJECTIVES

The objectives of undertaking the WRI in Paro and Thimphu Dzongkhags are:

- ➢ To collect, maintain and map the spatial data on water sources (both tapped and untapped sources).
- ➢ To collect information on the uses of tapped water sources.
- ➢ To validate the findings from the assessment and mapping of water sources in Bhutan 2021 and to ascertain the status of water sources.
- ➢ To assess the basic water quality parameters of the water sources.
- ➢ To collect and maintain water discharge data from the water sources.
- ➢ To map the spatial distribution of water sources to aid water abstraction planning activities.
- ➢ To assess the watershed conditions at the micro watershed (water source) level.

3. METHODOLOGY

The WRI was carried out in the two Dzongkhags of Paro and Thimphu covering 10 Gewogs and eight Gewogs respectively. The inventory was carried out by teams composed of staff from the DoW and the Department of Forests and Park Services (DoFPS). The WRI recorded not only the tapped sources but also the untapped (potential) water sources. The water sources recorded and georeferenced during the 2021 inventory were revisited in Paro and Thimphu Dzongkhags to validate its status and collect additional information including basic water quality parameters, presence of biodiversity and water infrastructures.

The data collection was done during the lean season and it was completed within a span of one month (i.e., from mid-March 2025 to mid-April 2025). Prior to the field data collection, all the water sources recorded during 2021 for Paro and Thimphu Dzongkhags were sorted and mapped using the Geographic Information System (GIS). The drainage systems in the Dzongkhags were overlaid on the maps to guide the team in locating the new and potential water sources in the Dzongkhags.

In addition to the sources inventoried in 2021, new or additional sources that are tapped or have potential as sources for drinking, irrigation and other uses were also identified and recorded during the inventory. In case of water sources with multiple tapping points, the data was collected from above the top most tapping point. For untapped or potential sources, the measurements were taken above the settlement or at the uppermost accessible points. Basically, the water sources were recorded considering the needs of the people.

Data was collected in Epicollect5, the SW Map was also used to upload geo-coordinates of the 2021 water sources data and to navigate to the source in the field. To ensure data security and facilitate future reference, parallel entries were also maintained using paper-based forms (Figure 1). Each water source was documented with photographs, geographic coordinates, and basic water quality parameters, among other relevant information. The basic water quality parameters were collected using the PCS tester (Apera PC60 Premium Multi-Parameter Tester). The standardized data collection format used during the inventory is provided in Annexure 1. Information on water sources particularly their locations, current status, and the underlying causes of any observed changes (in case of new sources), was gathered through consultations with key informants. The discharge from the water sources were measured using the float, volumetric or bucket, and level drop or ponding methods when it was impossible to use the flow probes or flow meters. Furthermore, the information on status of micro-watershed/catchment for each water source were also collected.

The data cleaning, sorting and analysis were done using the Microsoft Excel. The spatial distribution of water sources was mapped using the QGIS (Ver.3.40.5-Bratislava). The detailed methodology for the inventory is provided in Annexure 2

Figure 1: Data collection using Epicollect5 and paper-based form (Photo-Tashi Dorji, Thimphu Forest Range)

4. RESULTS

Surface water and groundwater are the primary sources from which water is typically obtained. In Bhutan, the majority of water used for drinking, irrigation, and commercial purposes is sourced from springs, lakes, streams, rivers, ponds, and marshes (WMD, 2021). Since spring is the point on the earth's surface from where the groundwater emerges from an aquifer and flows as the surface water, it is being categorized under surface water in this report as reported similarly by WMD, 2021. Groundwater abstraction, primarily through borewell, is minimal in comparison to surface water utilization. Accordingly, greater emphasis is placed on surface water resources in water management strategies.

Various sources of water are documented and analyzed to facilitate a clearer understanding of their distribution and conditions. To support this analysis, water source and micro-watershed (for each source) assessment data were collected from 10 Gewogs in Paro Dzongkhag and eight Gewogs in Thimphu Dzongkhag. The results from the analysis of the WRI data are presented Dzongkhag wise and Gewog wise in the subsequent sections.

Detailed information regarding the water sources within Paro and Thimphu Dzongkhags, including the names of water sources, their locations, estimated number of dependent households, current status of water sources, and water discharge are attached in Annexure 3.

4.1. Paro Dzongkhag

Paro Dzongkhag, located in the north-western region of Bhutan, experiences a temperate climate with distinct seasons. The average annual rainfall is around 1,000 mm, primarily concentrated during the monsoon season (June to August). Temperatures range from 26°C to 14°C in the summer and 14°C to -5°C in the winter. The Dzongkhag has an area of 1,293 square kilometers with a population of 43,362 (NSB, 2018). The Dzongkhag has a road network comprising 122 km of highway and 311.02 km of farm roads. It is home to Bhutan's only international airport, serving as the country's main aerial gateway and benefiting local farmers and businesses.

The WRI conducted in Paro Dzongkhag covered 10 Gewogs and recorded a total of 472 surface water sources, along with 23 borewells that serve as groundwater sources.

4.1.1. Number of water sources

A comprehensive inventory of water sources in Paro Dzongkhag recorded a total of 472 sources. This includes 213 water sources previously recorded in 2021 and an additional 259 water sources identified during this inventory. From the 237 water sources recorded in Paro Dzongkhag during 2021, 24 sources are not included in this report as some of them were difficult to locate in the field due to error in the geocoordinates, which could have occurred from wrong entry or poor accuracy of the GPS at the time of data collection in 2021, while some multiple

tapping points from the same source recorded separately during the 2021 assessment were considered as one source only in this report. Among the 10 Gewogs, Tsento Gewog has the highest number of water sources, totaling 125, followed by Dogar Gewog with 74 sources. On the other hand, Hungrel and Wangchang Gewogs recorded the lowest number (11) of water sources. The estimated number of households dependent on the water sources in the Dzongkhag is provided in the Annexure 3. The distribution of water sources across all Gewogs in the Dzongkhag is shown in Figure 2 and Figure 3.

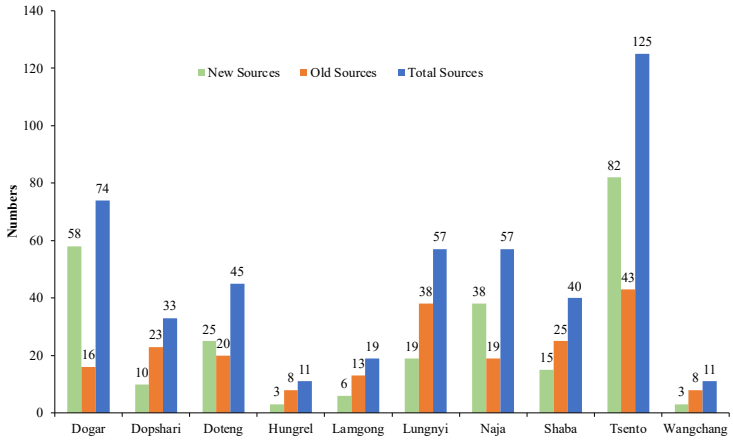

Figure 2: Gewog wise distribution of water sources in Paro Dzongkhag

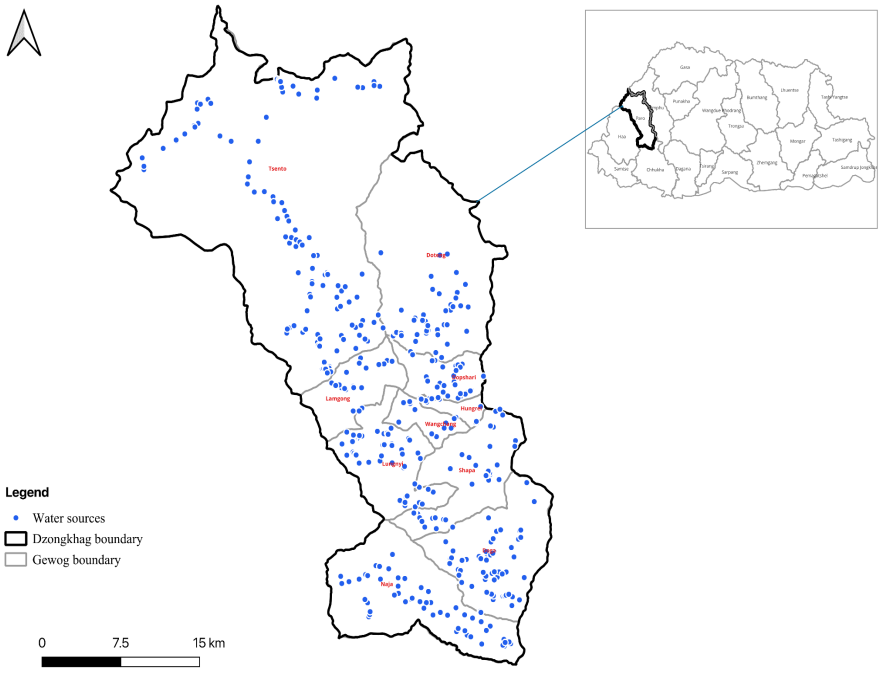

Figure 3: Map showing the water resources in Paro Dzongkhag

4.1.2. Types of water sources

In Paro Dzongkhag, five distinct types of water sources were identified (Figure 4). Springs accounted for the majority, making up 64.19% (303) of the total water sources, followed by streams at 30.30% (143). Ponds and marshes/swamps represented 2.75% (13) and 2.54% (12), respectively, while lakes constituted only 0.21% (1) of the total recorded sources. Out of the 472 sources, 452 sources are perennial, 8 sources are seasonal while the flow regime for 12 sources could not be determined.

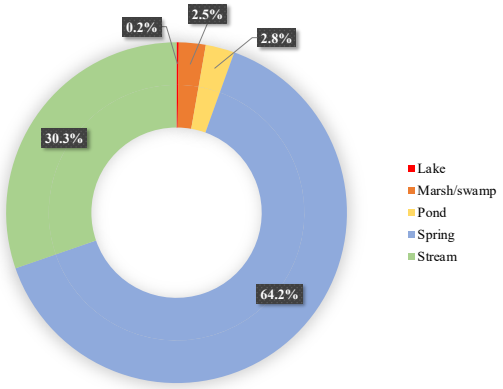

Figure 4: Types of water sources in Paro Dzongkhag

4.1.3. Uses of water sources and infrastructures

Figure 5 shows the various uses of water sources recorded in Paro Dzongkhag. The majority of the water sources are utilized for rural drinking purposes (308), followed by irrigation (23) and a combination of both irrigation and rural drinking (23). Some of the sources are also used for commercial purposes (8) such as industries (mineral water and beer production) and vehicle workshops. In addition, 97 water sources were identified as untapped.

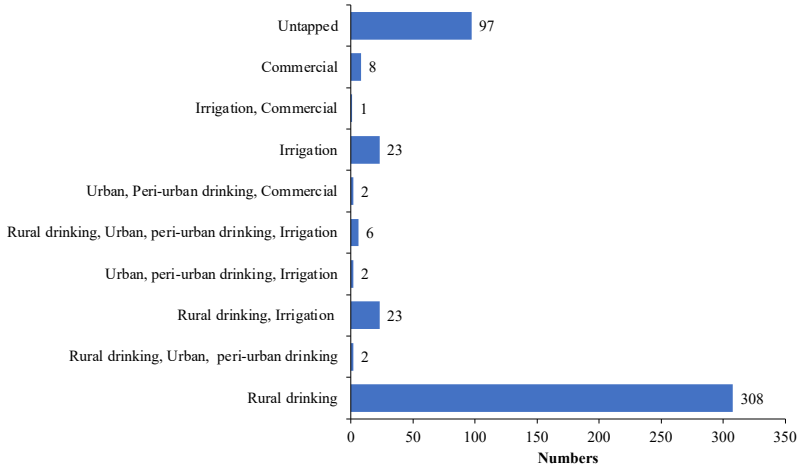

Figure 5: Uses of water sources in Paro Dzongkhag

In Paro Dzongkhag, some of the infrastructures observed at the water sources and its vicinity include concrete intake, stone intake, concrete sedimentation tanks, drums, PVC tanks, etc. As shown in Figure 6, concrete intake represented the most common type of water source infrastructure, accounting for 123 water sources. However, a larger number of sources (161) were found to have no water intake infrastructure. The other infrastructures observed at the sources is highlighted in the Figure below.

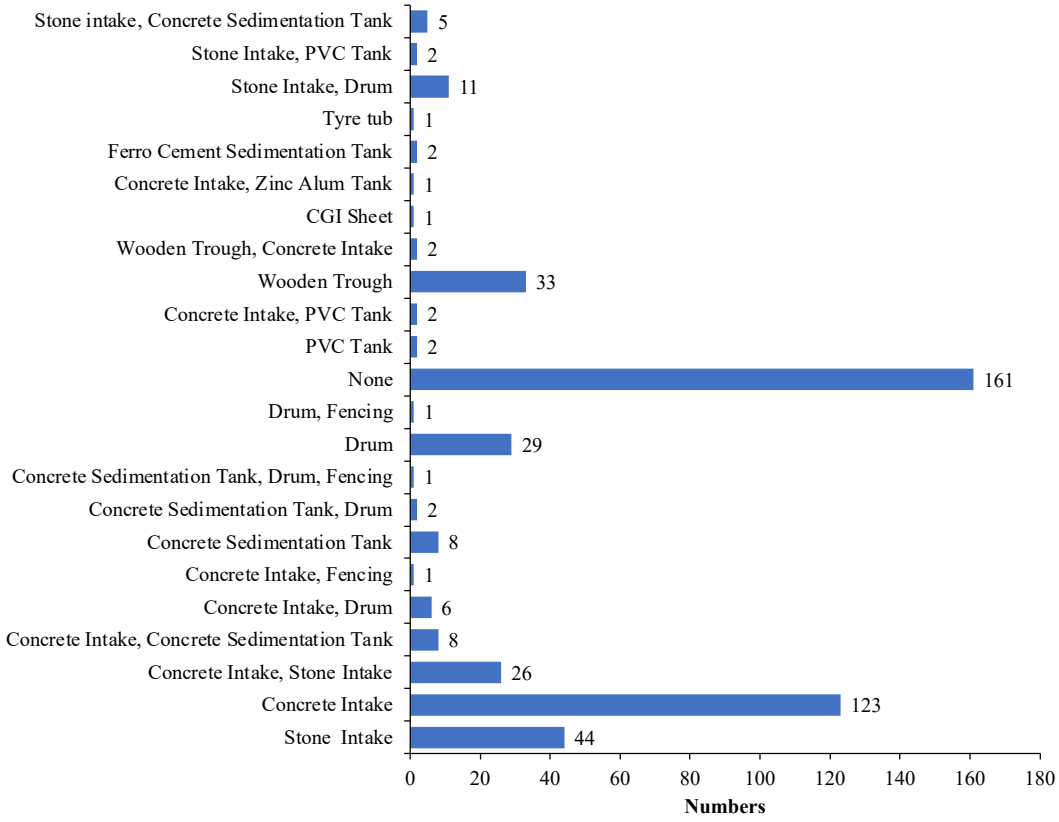

Figure 6: Types of infrastructures at water sources in Paro Dzongkhag

4.1.4. Status of water sources

The status of water sources was assessed based on the information provided by the key informants and in some cases by comparing their discharge data with the discharge records from 2021. However, for the newly identified sources, the assessment was based entirely on information provided by key informants. Out of 472 water sources recorded across 10 Gewogs under Paro Dzongkhag, 3% (16) have already dried up, 25% (117) are found to be drying, 43% (204) of the sources show no change in the water discharge, 15% (73) show increased water discharge. while for the 13% (62) of the water sources, the status could not be determined (Table 1). Out of the 16 dried up water sources, 62.50% (10) are ponds, 18.75% (3) are springs, 12.50% (2) are streams and 6.25% (1) are marshes/swamps. From the 117 sources that are drying,

72.65% (85) are springs, 23.93% (28) are streams, 1.71% (2) are marshes/swamps and 1.71% (2) are lakes and ponds.

The 16 dried up water sources recorded during the WRI were same sources, which were recorded during 2021 assessment as dried up (10), drying (3) and no change in discharge (3), i.e. 10 dried up sources recorded in 2021 were verified as dried up during this inventory, while six other sources recorded in 2021 were found to have dried up. From the 117 drying sources, 83 are the sources reported in 2021 while 34 are new water sources recorded in 2025.

The differences in water discharges recorded in 2021 and 2025 could have resulted from the use of different measurement methods, and time of measurement. The 2025 inventory used global flow probe and magnetic flow meter in addition to bucket method for measuring the discharge, whereas the 2021 inventory relied mostly on the float and bucket methods. Further, the efficiency of the inventory teams in handling the equipment and measuring the discharge could have also contributed to the discharge variations. Hence, the water discharge data of 2021 and 2025 may not be directly comparable due to the above reasons. It is possible that the discharge may have decreased or remained unchanged over the years. Hence, to compare the actual trends of water discharge (whether drying or increasing), several years of discharge data from the same water sources would be required.

In view, of the above, the data collected in this WRI could be taken as the baseline data for water discharges from the water sources for both Paro and Thimphu Dzongkhags.

Table 1: Status of water sources in Paro Dzongkhag

Sl.No	Gewog	Dried up (no.)	Drying (no.)	No change (no.)	Increased (no.)	No idea (no.)	Total (no.)
1	Dogar	0	16	33	6	19	**74**
2	Dopshari	1	17	3	12	0	**33**
3	Doteng	1	11	17	11	5	**45**
4	Hungrel	0	8	1	2	0	**11**
5	Lamgong	0	11	3	5	0	**19**
6	Lungnyi	1	18	14	21	3	**57**
7	Naja	1	9	17	5	25	**57**
8	Shaba	10	8	13	6	3	**40**
9	Tsento	1	13	103	2	6	**125**
10	Wangchang	1	6	0	3	1	**11**
Total		**16**	**117**	**204**	**73**	**62**	**472**

The Gewog wise analysis of the water source status in Paro Dzongkhag revealed that Shaba Gewog has the maximum (10) dried up sources and Lungnyi Gewog recorded the maximum (18) numbers of drying sources. The status of water sources in the Dzongkhag is shown in the Figure 7.

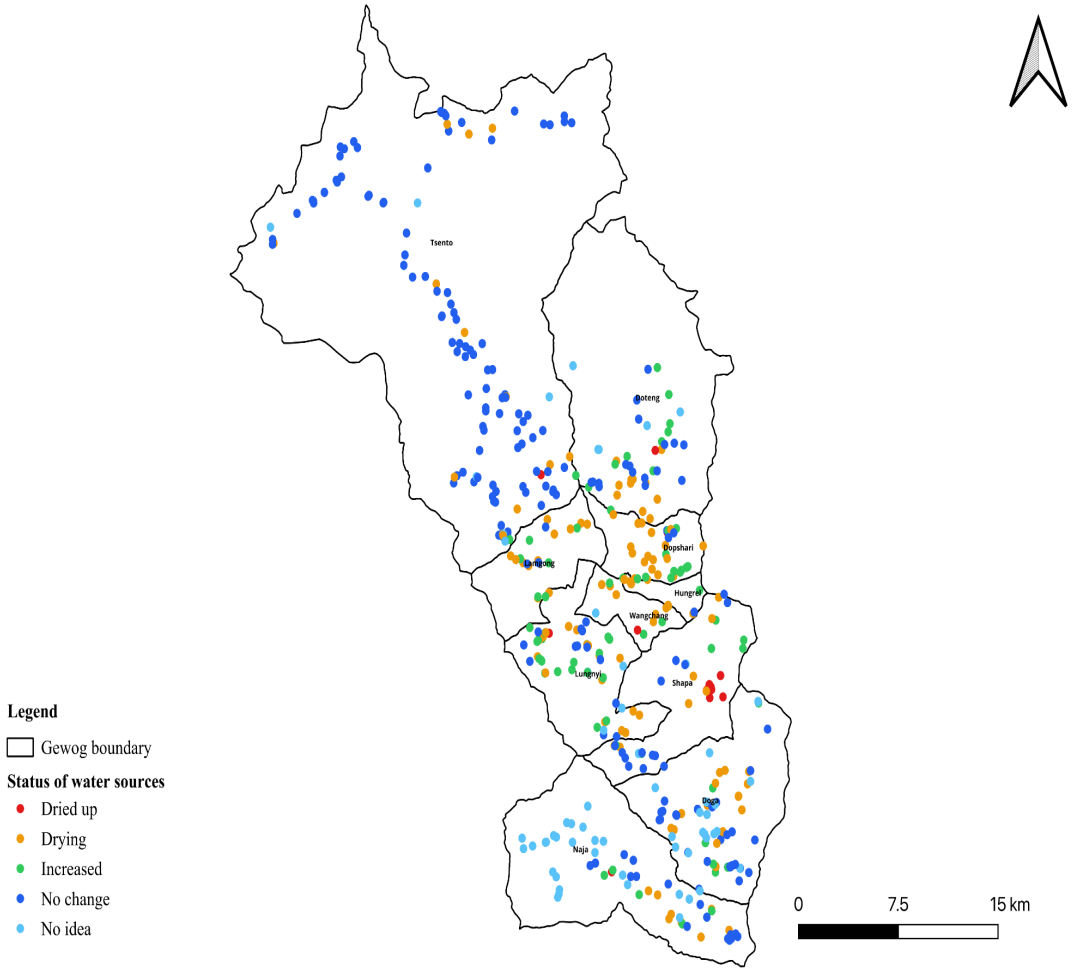

Figure 7: Map showing the status of water sources in each Gewog under Paro Dzongkhag

Although a total of 472 water sources were recorded in Paro Dzongkhag, water quality parameters were collected only for 454 water sources considering the presence of dried up and inaccessible sources. The water quality parameters collected indicate that the electrical conductivity and total dissolved solids (TDS) for all water sources in the 10 Gewogs of Paro Dzongkhag are within the limit of 1000 µS/cm and 1000 mg/L respectively. Of the 454 water sources, 93.83% (426) have a pH range of 6.5-8.5, 0.66% (3) have pH below 6.5 and 5.51% (25) have pH above 8.5. As per the Bhutan Drinking Water Quality Standards (2025), the data indicates that the majority of the water sources in Paro Dzongkhag meets the standards for drinking. The Gewog wise information on the basic water quality parameters is provided in the Table 2.

Table 2: Basic water quality parameters of water sources (min-max range) in Paro Dzongkhag

Sl.No.	Gewog	EC (µS/cm)	pH	Salinity (ppt)	Temp (°C)	TDS (mg/L or ppm)
1	Dogar	11.2 - 363	6.62 - 8.65	0.01 - 0.18	3.9 - 18	7.9 - 265
2	Dopshari	18.1 - 193.1	6.11 - 8.11	0.01 - 0.1	6.6 - 21.9	13 - 137
3	Doteng	20.6 - 239	7.34 - 8.75	0.01 - 0.2	6.6 - 18.2	14.9 - 170
4	Hungrel	104.6 - 318	7.13 - 8.45	0.05 - 0.16	11.7 - 19.3	74.3 - 225
5	Lamgong	38.6 - 212	6.78 - 8.46	0.02 - 0.11	9.8 - 20.6	27 - 143/
6	Lungnyi	21.2 - 263	6.98 - 8.59	0.01 - 0.13	5.2 - 19.5	16 - 237
7	Naja	7.56 - 305	6.72 - 8.63	0.01 - 0.15	4.9 - 16.5	2.17 - 205
8	Shaba	22.4 - 731	6.41 - 8.25	0.01 - 0.37	5.1 - 18.3	15.8 - 521
9	Tsento	11.3 - 521	6.51 - 8.77	0.01 - 0.27	3.7 - 19.8	8.8 - 364
10	Wangchang	95.4 - 302	6.31 - 8.44	0.05 - 0.15	13.7 - 20.1	69.2 - 217

Based on the observations, the water sources support various biodiversity including aquatic invertebrates, birds, fishes, algae, and other aquatic vegetation. From the data, the majority of the water sources show no evidence of biodiversity at the time of the inventory, however, it does not mean that the water sources do not support biodiversity. The data collection was done based on visual observation at the time of visiting the water source and no detailed assessment of biodiversity at the water source was conducted (Table 3).

Table 3: Presence of biodiversity at the water sources in Paro Dzongkhag

Sl.No.	Biodiversity observed	No. of sources
1	Algae	7
2	Algae, Aquatic birds	1
3	Algae, Aquatic invertebrates, Aquatic vegetation	13
4	Aquatic birds	10
5	Aquatic birds, Aquatic invertebrates	3
6	Aquatic invertebrates	117
7	Aquatic invertebrates, Algae	2
8	Aquatic invertebrates, Aquatic vegetation	64
9	Aquatic vegetation	8
10	Fish, Aquatic birds	2
11	No evidence	245
	Grand Total	**472**

4.1.5. Causes of water sources depletion

A total of 117 drying and 16 dried-up water sources were recorded across 10 Gewogs in Paro Dzongkhag. Primary causes of the drying water sources were recorded through consultations with the local field guides.

Six key factors contributing to the decline of water sources in Paro Dzongkhag were identified (Figure 8). Climate change (23) was recognized as one of the primary drivers. Other contributing factors included forest degradation and deforestation resulting from logging, illegal felling and forest fires; natural calamities/earthquakes and other anthropogenic activities such as road construction and developmental works. Notably, the majority of the drying water sources (72) had no clearly identifiable cause of depletion (unknown).

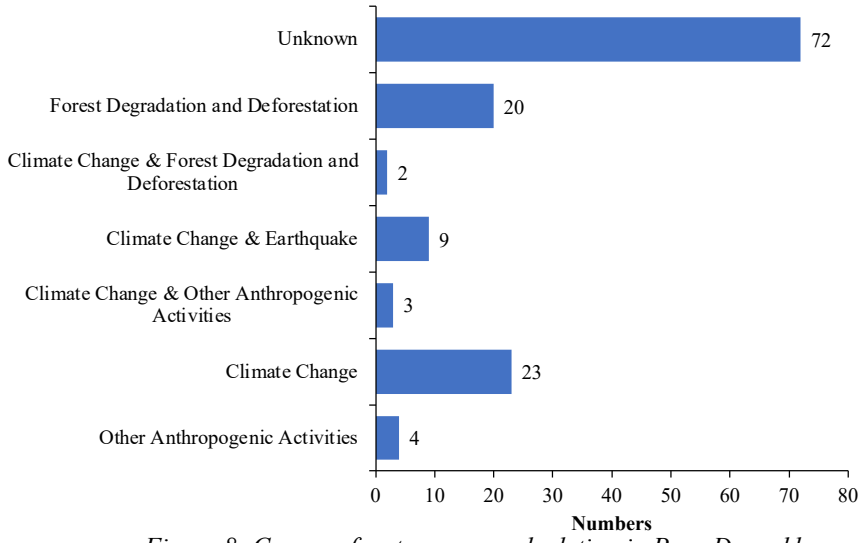

Figure 8: Causes of water sources depletion in Paro Dzongkhag

4.1.6. Watershed classification of water sources

The assessment of the catchment or watershed of each water source as micro-watersheds, was carried out for all the water sources inventoried in Paro Dzongkhag. The micro-watersheds combine to form bigger sub-watershed or watershed of the Dzongkhag. The overall risk rating category was assigned for each of the micro-watersheds in accordance with the Watershed Classification Guideline, 2016. According to the guideline, there are four watershed categories namely Pristine, Normal, Degraded and Critical, based on the condition score and the water use score of the watersheds.

As shown in the Figure 9, approximately 44.28% (209) of the micro-watersheds associated with water sources in Paro Dzongkhag are classified as being in a Normal condition, followed closely by 43.22% (204) categorized as Pristine, indicating minimal or no anthropogenic disturbance. Only 12.50% (59) of the micro-watersheds are identified as Degraded, reflecting observable

signs of ecological stress or decline. Notably, no micro-watersheds were classified under the Critical category, suggesting an absence of severely impacted or highly vulnerable micro-watershed areas.

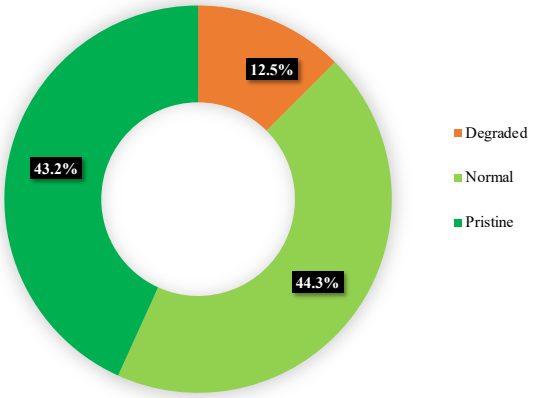

Figure 9: Watershed risk categories for water sources in Paro Dzongkhag

The Gewog wise information of the risk categories of micro-watersheds for the water sources is presented in Figure 10. The Gewog with the highest number of micro-watersheds falling in the Degraded category is Shaba Gewog (13) followed by Lungnyi and Dogar Gewogs with nine sources each. Tsento Gewog has the highest number of micro-watersheds in the Pristine category (55) and Normal category (65).

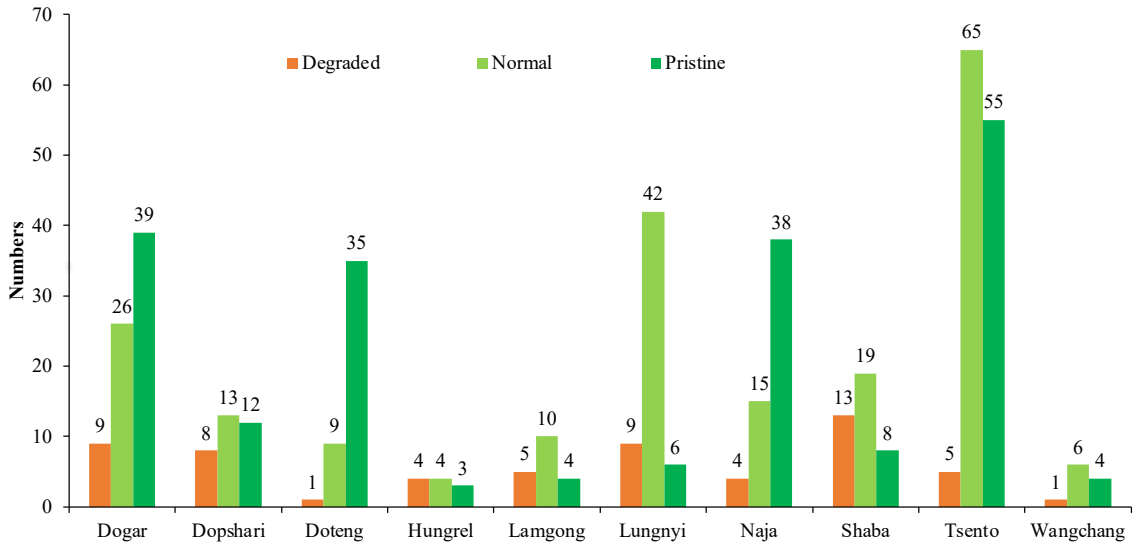

Figure 10: Water sources under different watershed categories in Paro Dzongkhag

The forest types, where the water sources are located, were recorded during the WRI. The majority of the water sources under Paro Dzongkhag are located in the Blue Pine Forests at 49.15% (232) as shown in Figure 11.

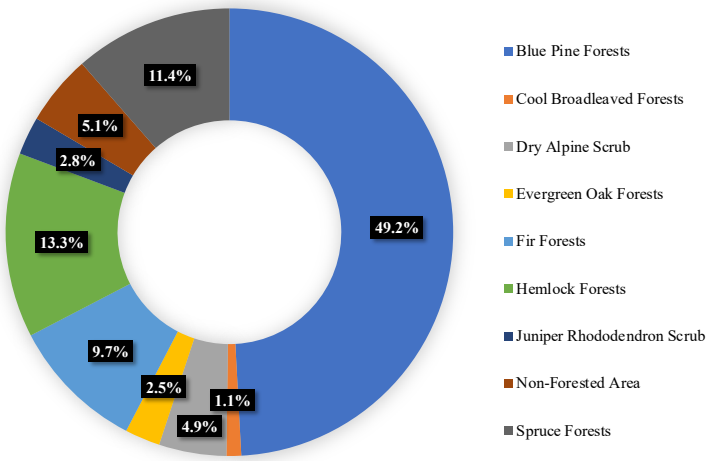

Figure 11: Water sources under different forest types in Paro Dzongkhag

When comparing the information on forest types with that of the risk category of the micro-watersheds (Figure 12), the highest number of Degraded micro-watersheds fall under the Blue Pine Forests (39), which corresponds to 17% of the water sources under that forest type. In terms of proportion by forest type, the Non-Forested Area, has the highest percentage (20%) of its water sources falling in the Degraded category.

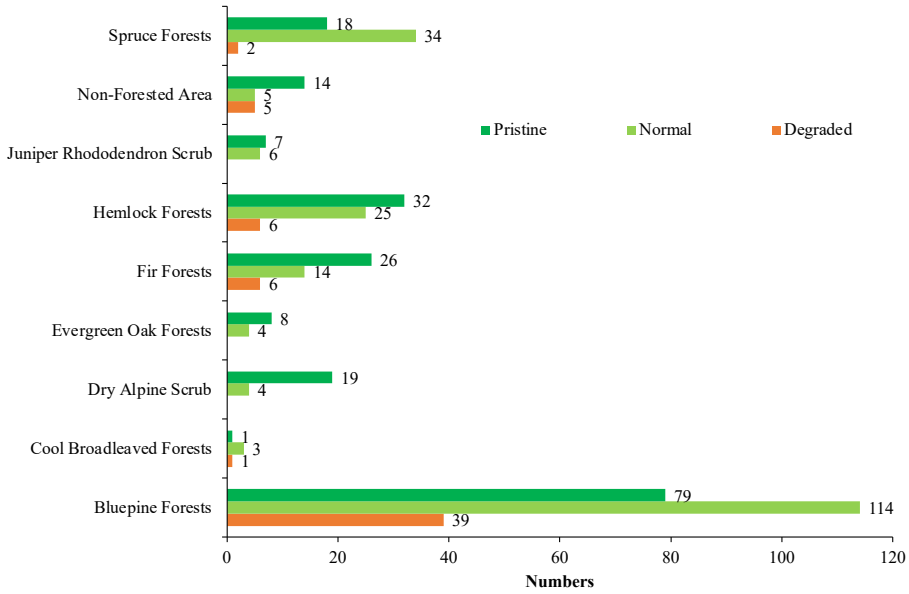

Figure 12: Watershed classification by forest types for water sources in Paro Dzongkhag

4.1.7. Number of borewells

In addition, the WRI also recorded the data on the existing borewells under Paro Dzongkhag (Figure 13). The inventory data collected shows that there are 23 numbers of borewells

extracting groundwater in Paro Dzongkhag out of which 22 borewells are in Dopshari Gewog while Doteng Gewog has only one borewell.

Figure 13: Borewell in Doteng Gewog (Photo: Kuenzang Dorji, DoW)

4.2. Thimphu Dzongkhag

Thimphu, the capital city of Bhutan, is situated in the western region of the country at an altitude of 2,330 meters above sea level. Covering a total area of 1,748.59 square kilometers, the Dzongkhag has approximately 42.9% of its land under forest cover. Administratively, it is divided into eight Gewogs. The Gewogs are further subdivided into 40 Chiwogs and 198 villages, encompassing a total of 2,204 households. According to the 2017 Population and Housing Census of Bhutan, Thimphu Dzongkhag including the Thromde, has a population of 128,207 with 63,718 males and 64,489 females. This high population density and rapid urban development especially in the capital city, puts pressures on the existing water sources to meet the growing water demand. Assessing available surface and groundwater sources has become crucial for demand forecasting and efficient allocation of water to meet present and future consumption needs and safeguard long-term resource sustainability in the Dzongkhag.

The WRI conducted in Thimphu Dzongkhag covered eight Gewogs and documented a total of 495 surface water sources, along with 9 borewells that serve as groundwater sources. Comprehensive details about these water sources including their location, usage, and condition are provided in the following sub-sections.

4.2.1. Number of water sources

A comprehensive inventory of water sources in Thimphu Dzongkhag recorded a total of 495 sources. This includes 132 water sources previously recorded in 2021 and an additional 363 water sources identified during this inventory. From the 145 water sources recorded in Thimphu Dzongkhag during 2021, 13 sources are not included in this report as some of them were difficult to locate in the field due to error in the geocoordinates, which could have occurred from wrong entry or poor accuracy of the GPS at the time of data collection in 2021, while some multiple tapping points from the same source recorded separately during the 2021 assessment were considered as one source only in this report. Among the eight Gewogs, Lingzhi Gewog has the

highest number of water sources, totaling 102 sources, followed by Mewang Gewog with 93 sources. On the other hand, Dagala Gewog recorded the lowest number of water sources with 31 sources. The estimated number of households dependent on the water sources in the Dzongkhag is provided in the Annexure 3. The distribution of surface water sources across all Gewogs in the Dzongkhag is shown in Figure 14 and Figure 15.

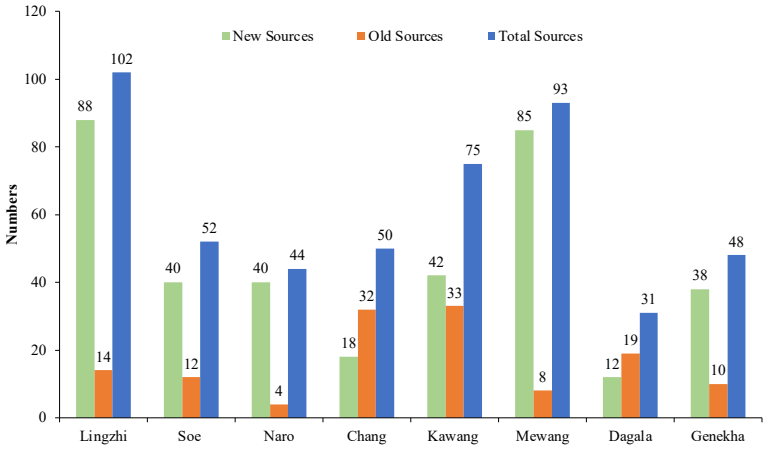

Figure 14: Gewog wise distribution of water sources in Thimphu Dzongkhag

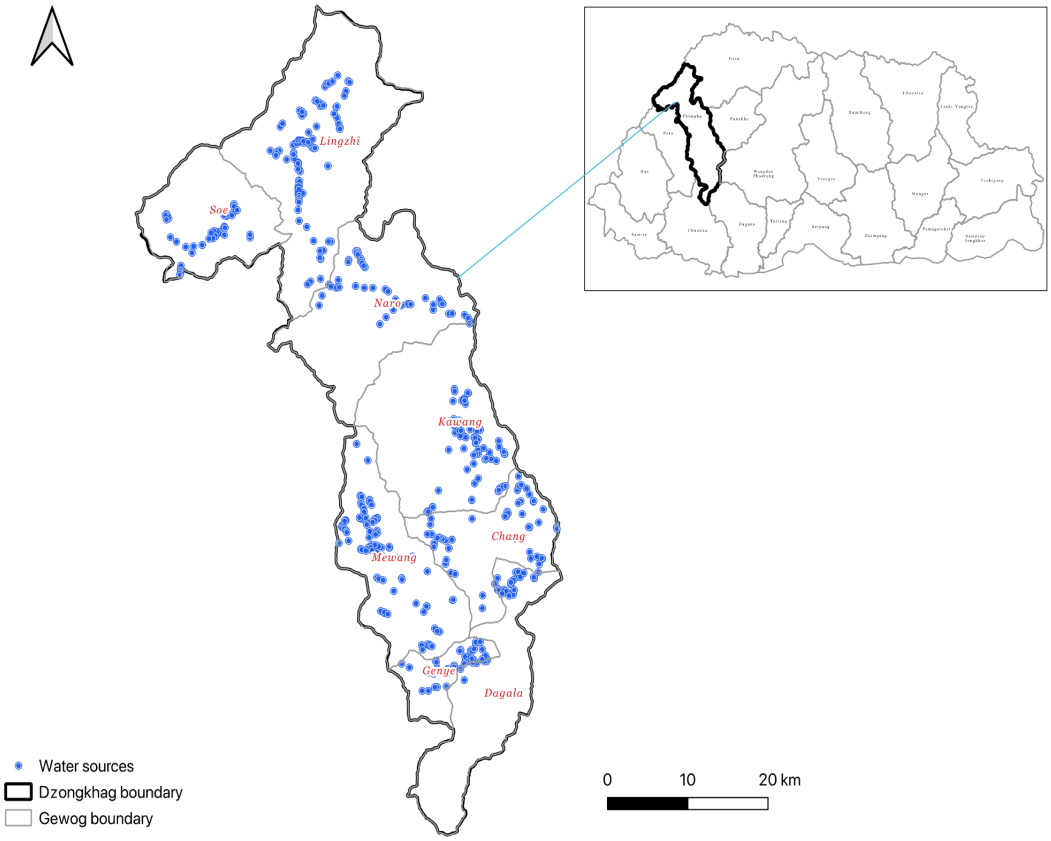

Figure 15: Map showing the water sources in Thimphu Dzongkhag

4.2.2. Types of water sources

In Thimphu Dzongkhag, six distinct types of water sources were identified (Figure 16). Streams accounted for the majority, making up 49.09% (243) of the total water sources, followed by springs at 42.83% (212) and marshes/swamps 4.04% (20). Lakes and rivers represented 2.42% (12) and 1.41% (7) respectively, while ponds constituted only 0.20% (1) of the total recorded sources. Out of the 495 sources, 487 sources are perennial and 8 sources are seasonal.

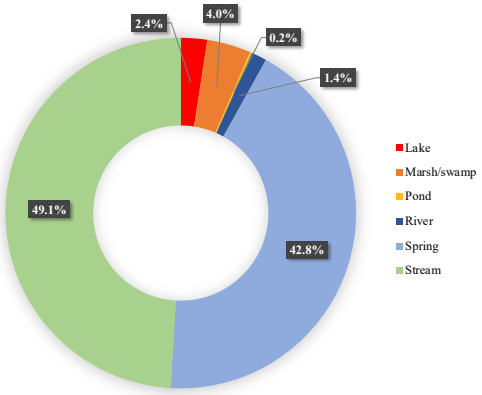

Figure 16: Types of water sources in Thimphu Dzongkhag

4.2.3. Uses of water sources and infrastructures

Figure 17 shows the various uses of water sources recorded in Thimphu Dzongkhag. The majority of the water sources are primarily used for rural drinking purposes (200), followed by urban and peri-urban drinking (50). Some of the sources are also used for commercial purposes (10) such as industries (mineral water and beer production) and vehicle workshops. A substantial number of water sources (169) remain untapped, presenting opportunities for future development and water resource planning to meet rising demand or to support resilient strategies in times of scarcity. The other uses of water sources are given in the Figure below.

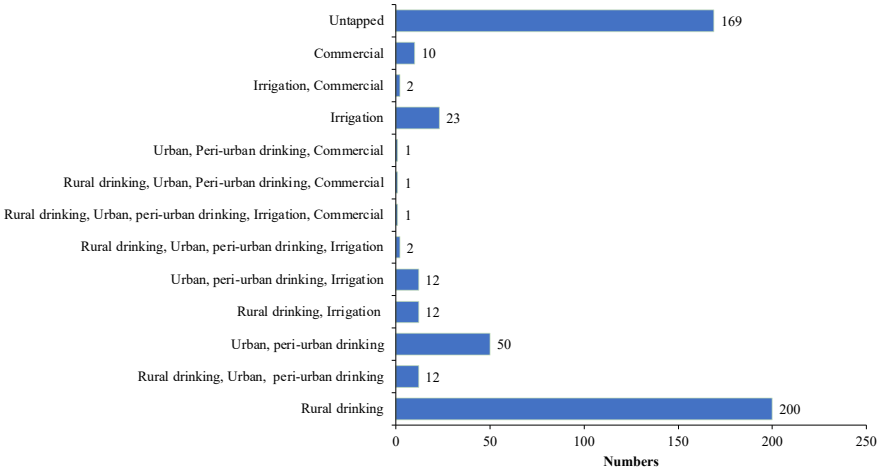

Figure 17: Uses of water sources in Thimphu Dzongkhag

In Thimphu Dzongkhag, some of the infrastructures observed at the water sources and its vicinity include concrete intake, stone intake, concrete sedimentation tanks, drums, PVC tanks, etc. As shown in Figure 18, concrete intake represented the most common type of water source infrastructure, accounting for 126 sources. However, a larger number of sources (233) were found to have no infrastructure at all and the details of other infrastructures are reflected in the Figure below.

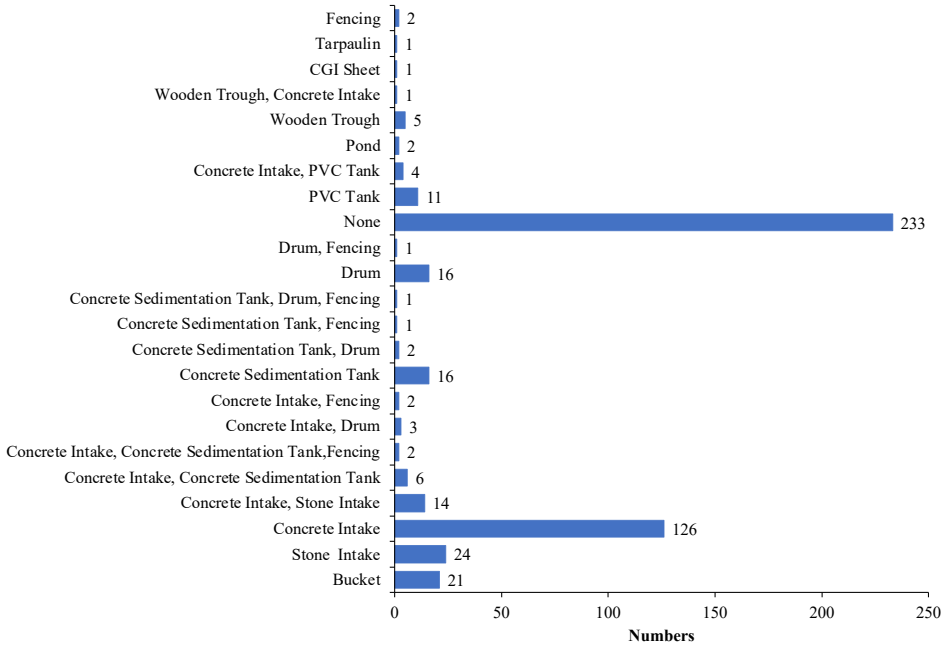

Figure 18: Types of infrastructures at water sources in Thimphu Dzongkhag

4.2.4. Status of water sources

The status of water sources was assessed based on the information provided by the key informants and in some cases by comparing their discharge data with the discharge records from 2021. However, for the newly identified sources, the assessment was based entirely on information provided by key informants. From the total of 495 water sources recorded across eight Gewogs under Thimphu Dzongkhag, 0.4% (2) have already dried up, 22% (110) were found to be drying, 53% (264) of the sources show no change in the water discharge, 1% (5) show increased water discharge and status of the 23% (114) could not be determined (Table 4). The two dried water sources include one spring and one stream while out of the 110 drying sources, 52.73% (58) are streams, 40% (44) are springs, 4.54% (5) are marshes/swamps and 2.73% (3) include lake, river and pond.

The two dried up water sources recorded during the WRI were sources recorded during 2021 assessment as drying. From the 110 drying sources, 61 are old sources reported in 2021 while 49 are newly recorded sources.

Table 4: Status of water sources in Thimphu Dzongkhag

Sl.No	Gewog	Dried (no.)	Drying (no.)	No change (no.)	Increased (no.)	No idea (no.)	Total (no.)
1	Chang	1	13	18	1	17	50
2	Dagala		4	20		7	31
3	Genye		10	27	1	10	48
4	Kawang		32	21	1	21	75
5	Lingzhi		8	75	2	17	102
6	Mewang	1	39	34		19	93
7	Naro		3	18		23	44
8	Soe		1	51			52
Total		**2**	**110**	**264**	**5**	**114**	**495**

The Gewog wise analysis of the water source status in Thimphu Dzongkhag revealed that Chang and Mewang Gewogs have one water source each that have dried up while Mewang Gewog recorded the maximum (39) numbers of drying sources. The status of water sources in the Dzongkhag is shown in the Figure 19.

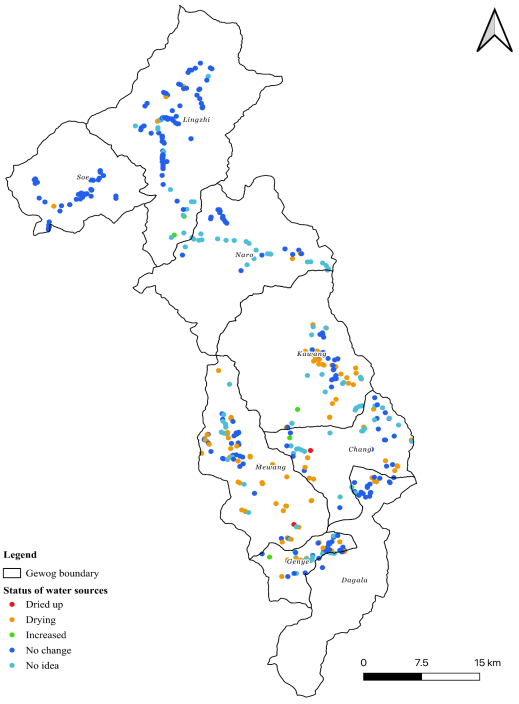

Figure 19: Map showing the status of water sources in each Gewog under Thimphu Dzongkhag

Although a total of 495 water sources were recorded in Thimphu Dzongkhag, water quality parameters were collected only for 493 water sources considering the presence of dried-up sources. The water quality parameters collected indicate that the electrical conductivity and TDS for all water sources in the eight Gewogs of Thimphu Dzongkhag are within the limit of 1000

µS/cm and 1000 mg/L respectively. Of the 493 water sources excluding two dried water sources, 81.54% (402) have a pH range of 6.5-8.5, 1.22% (6) have pH below 6.5 and 17.24% (85) have pH above 8.5. As per the Bhutan Drinking Water Quality Standard (2025), the data indicates that the majority of the water sources in Thimphu Dzongkhag meets the standard for drinking. The Gewog wise information on the basic water quality parameters is provided in the Table 5.

Table 5: Basic water quality parameters of water sources (min-max range) in Thimphu Dzongkhag

Sl.No.	Gewog	EC (µS/cm)	pH	Salinity (ppt)	Temp (°C)	TDS (mg/L or ppm)
1	Chang	11.9 - 269	7.12 - 8.81	0.01 - 0.13	4.9 - 14.9	8.3 - 190
2	Dagala	1.3 - 72.5	6.5 - 8.05	0 - 0.04	5.4 - 12.4	0.9 - 51.3
3	Genekha	9.5 - 227	6.91 - 8.53	0 - 0.11	6.6 - 15.2	6.7 - 155
4	Kawang	7.89 - 227	6.33 - 8.59	0 - 0.11	4.2 - 24.7	5.6 - 162
5	Lingzhi	86 - 699	5.588 - 9.16	0.04 - 0.62	2 - 17.4	63 - 505
6	Mewang	6.9 - 392	6.43 - 8.46	0 - 0.2	8.2 - 23.7	4.9 - 278
7	Naro	117.2 - 547	7.94 - 8.91	0.06 - 0.27	3.4 - 15.6	83.9 - 388
8	Soe	14.1 - 429	6.4 - 8.91	0.01 - 0.21	2.7 - 15.7	10.3 - 304

Based on the observations, the water sources also support various biodiversity including aquatic invertebrates, birds, fishes, algae, and other aquatic vegetation. From the data, the majority of the water sources show no evidence of biodiversity at the time of the inventory, however, it does not mean that the water sources do not support biodiversity. The data collection was done based on visual observation at the time of visiting the water source and no detailed assessment of biodiversity at the water source was conducted (Table 6).

Table 6: Presence of biodiversity at the water sources in Thimphu Dzongkhag

Sl. No.	Biodiversity observed	No. of sources
1	Algae	23
2	Algae, Aquatic birds, Aquatic invertebrates	2
3	Aquatic birds, Aquatic invertebrates	4
4	Aquatic birds, Aquatic invertebrates, Fish	3
5	Aquatic birds, Aquatic invertebrates, Fish, Aquatic vegetation	1
6	Aquatic invertebrates	63
7	Aquatic invertebrates, Algae	10
8	Aquatic invertebrates, Aquatic vegetation	3
9	Aquatic vegetation	8
10	Aquatic vegetation, Algae	1
11	Fish	5
12	No evidence	372
	Grand Total	**495**

4.2.5. Causes of water source depletion

A total of 110 drying and two dried up water sources were recorded from eight Gewogs under Thimphu Dzongkhag. Primary causes of the drying water sources were recorded through consultations with the local field guides.

Five crucial factors affecting the declining water sources within Thimphu Dzongkhag were identified (Figure 20). Climate change (54) was attributed as one of the main factors causing decline of water sources. Other causes included forest degradation and deforestation activities due to logging, forest fires and mining; earthquakes and other anthropogenic activities such as road construction/developmental works and population growth. The reasons for the 11 drying water sources could not be determined.

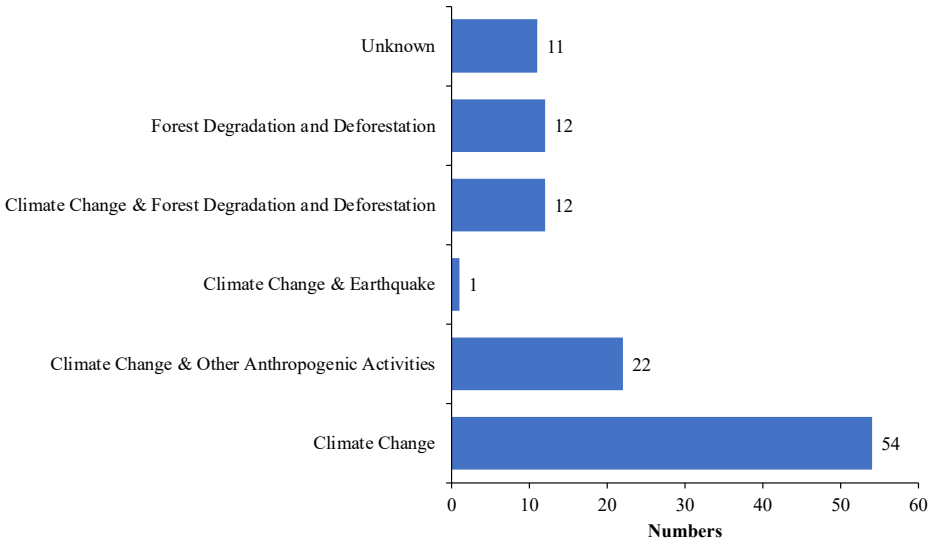

Figure 20: Causes of water sources depletion for Thimphu Dzongkhag

4.2.6. Watershed classification of water sources

The assessment of the catchment or micro-watershed of each water source was carried out for all the water sources inventoried in Thimphu Dzongkhag. The risk category was assigned for each of the micro-watersheds in accordance with the Watershed Classification Guideline, 2016. According to the guideline, there are four watershed categories namely Pristine, Normal, Degraded and Critical, based on the condition score and the water use score of the watersheds.

As shown in the Figure 21, approximately 49.70% (246) of the micro-watersheds associated with water sources in Thimphu Dzongkhag are classified as being in a Pristine condition, indicating minimal or no anthropogenic disturbance, followed by 27.27% (135) categorized as Normal. About 23.03% (114) of the micro-watersheds are identified as Degraded, reflecting

observable signs of ecological stress or decline. Notably, no micro-watersheds were classified under the Critical category, suggesting an absence of severely impacted or highly vulnerable micro-watershed.

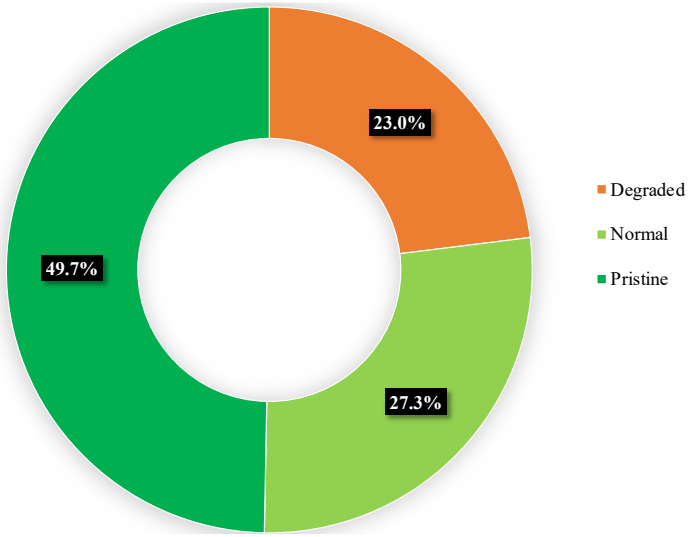

Figure 21: Watershed risk categories for water sources in Thimphu Dzongkhag

The Gewog wise information of the risk categories of micro-watersheds for the water sources is presented in Figure 22. The Gewog with the highest number of water sources falling under the 'Degraded' micro-watershed category is Genekha Gewog (29) followed by Mewang Gewog (25) and Kawang Gewog (21). Lingzhi Gewog has the highest number of its micro-watersheds under the Pristine risk category (71) followed by Soe Gewog (48) and Mewang Gewog (41).

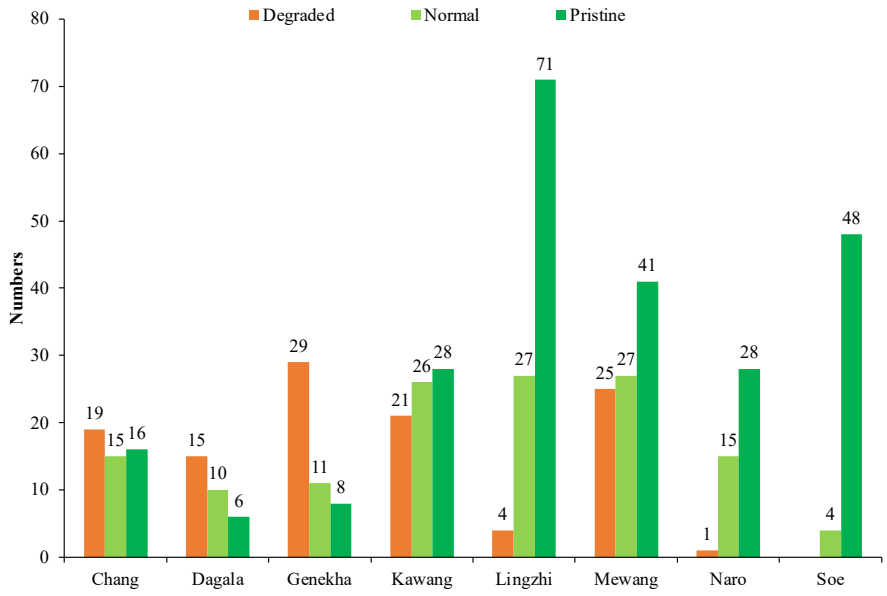

Figure 22: Water sources under different watershed categories in Thimphu Dzongkhag

The forest types, where the water sources are located, were also recorded during the WRI. The majority of the water sources under Thimphu Dzongkhag are located in the Blue Pine Forests at 26.10% (129) followed by Dry Alpine Scrub at 17.60% (87) and Juniper Rhododendron Scrub at 17.40% (86). The Non-Forested Area has the least number of water sources identified at 1.60% (8) (Figure 23).

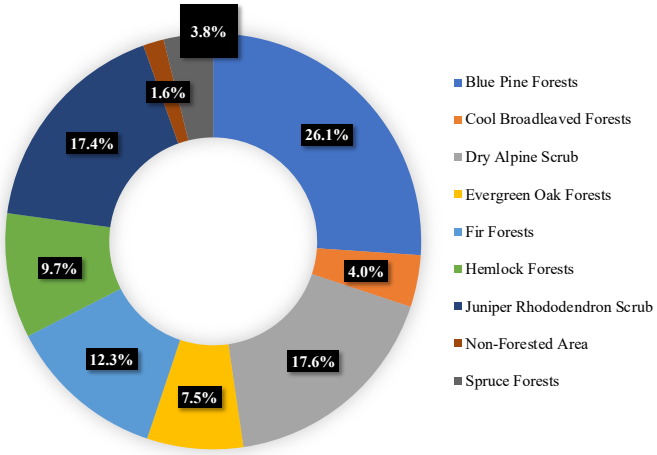

Figure 23: Water sources under different forest types in Thimphu Dzongkhag

47 of the 129 water sources located under Blue Pine Forests of Thimphu Dzongkhag have their sub-watersheds falling under the Degraded risk category (Figure 24). The forest type having the highest number of micro-watersheds under the Pristine risk category is the Juniper Rhododendron Scrub with 66 sources. The Dry Alpine Scrub has the second highest number of water sources under the Pristine risk category with 58 number of sources.

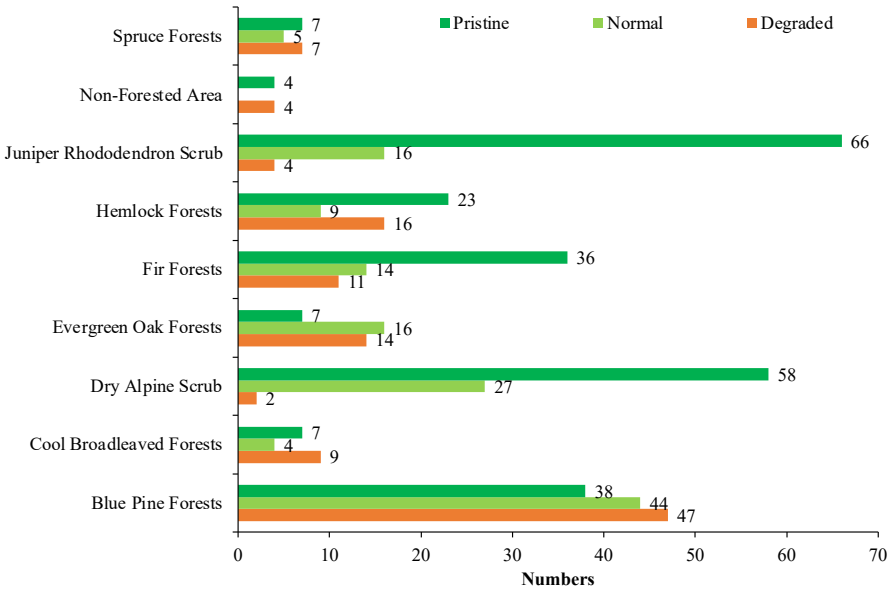

Figure 24: Watershed classification by forest types for water sources in Thimphu Dzongkhag

4.2.7. Number of borewells

In addition, the WRI also recorded the data on the existing borewells under Thimphu Dzongkhag. The inventory data collected shows that there are 9 borewells extracting the groundwater in Chang Gewog under Thimphu Dzongkhag.

5. GEWOG WISE WATER SOURCE INFORMATION

5.1. Paro Dzongkhag

5.1.1. Dogar Gewog

Dogar Gewog recorded a total of 74 water sources. This includes 16 water sources previously recorded in 2021 and an additional 58 water sources identified during this inventory. Among the sources, three distinct types were identified (Figure 25). Springs accounted for the majority, making up 77.03% (57) of the total, followed by streams at 21.62% (16), while ponds constituted only 1.35% (1) of the total recorded sources. All the sources are recorded as perennial.

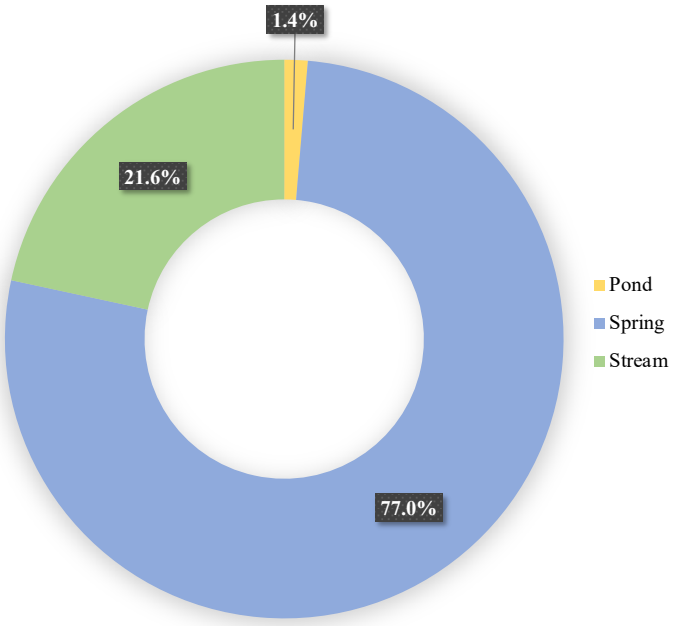

Figure 25: Types of water sources in Dogar Gewog

Out of the 74 water sources recorded in Dogar Gewog, 21.62% (16) are drying, 44.59% (33) sources show no change in their discharges, 8.11% (6) sources have increased discharges while the status of discharge from the 25.68% (19) sources could not be determined. The location and status of the water sources are also depicted in the map (Figure 26).

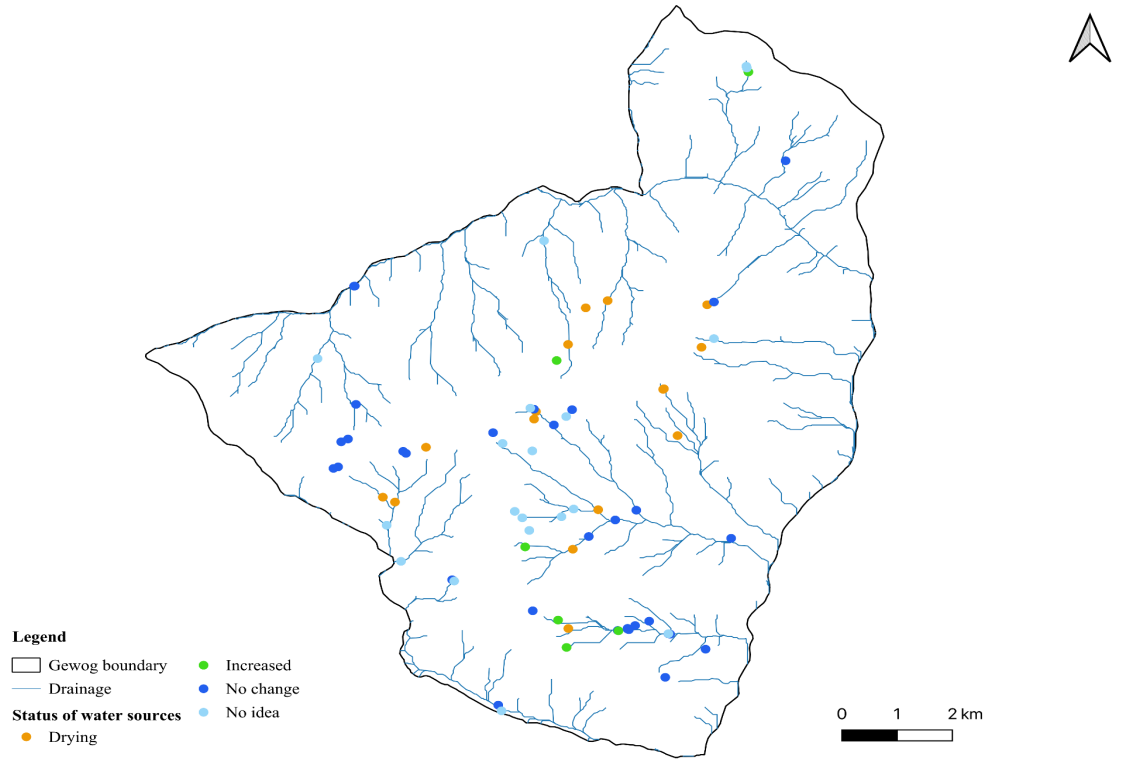

Figure 26: Map showing the status of water sources in Dogar Gewog

Dogar Gewog recorded a total of 16 drying water sources. Forest degradation and deforestation activities (5) was identified as one of the main contributing factors for the drying water sources at Dogar Gewog followed by climate change (3), combination of climate change and earthquake (3) and other anthropogenic activities (1). However, the causes behind 4 of the drying water sources remained unknown (Figure 27).

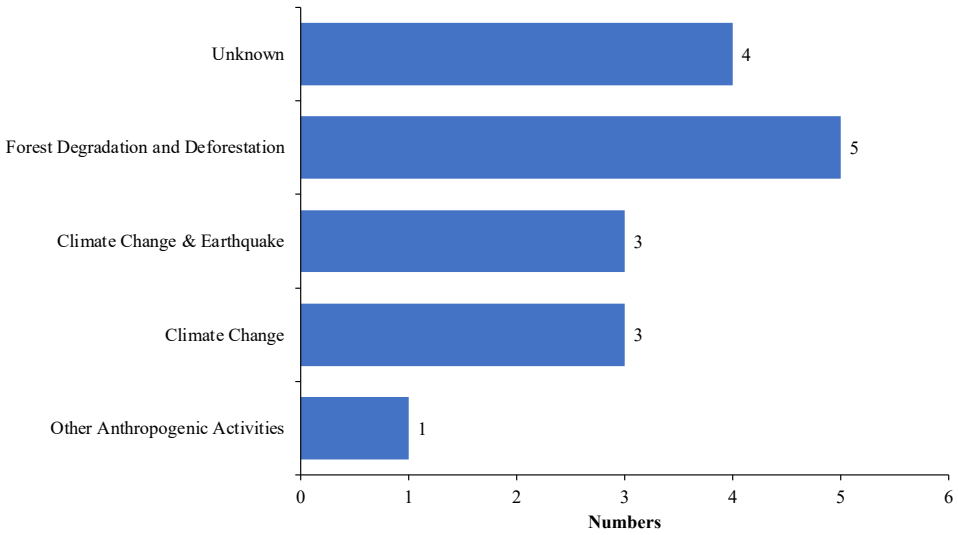

Figure 27: Causes of water sources depletion in Dogar Gewog

As shown in the Figure 28, 52.70% (39) of the micro-watersheds associated with water sources in Dogar Gewog are classified as being in a Pristine condition, followed by 35.14% (26) under Normal, and 12.16% (9) under the Degraded category.

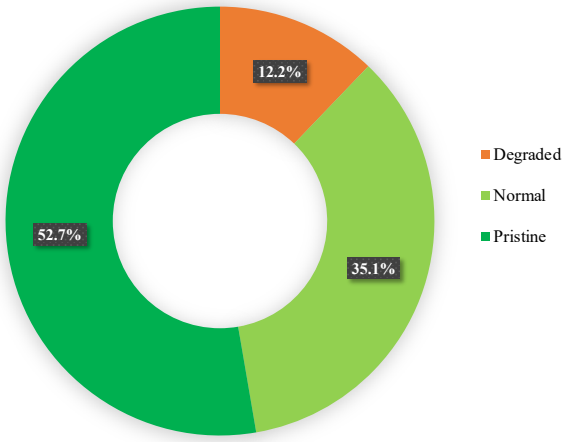

Figure 28: Watershed classification for water sources in Dogar Gewog

Of the 74 water sources under Dogar Gewog, 23 sources are recorded in Blue Pine Forests followed by 19 in Fir Forests and 12 in Hemlock Forests (Figure 29). There are no sources recorded from Dry Alpine Scrubs and Cool Broadleaved Forests.

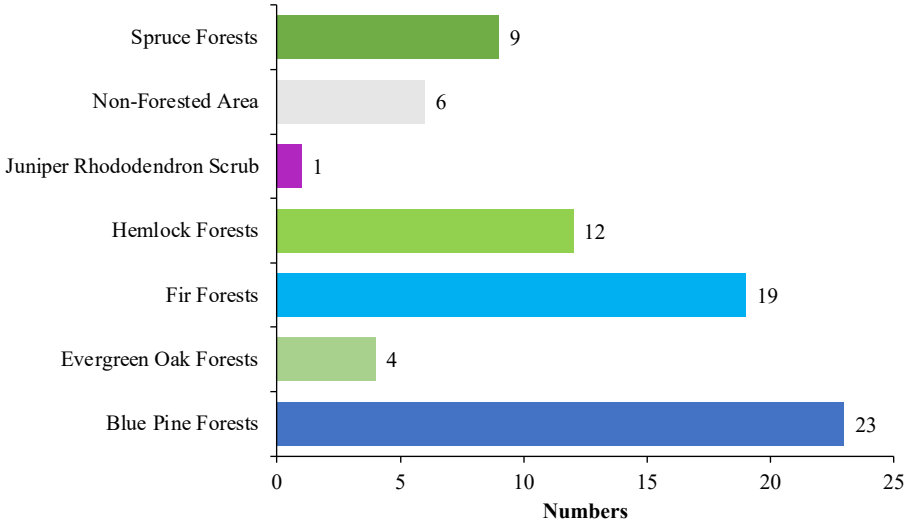

Figure 29: Water sources under different forest types in Dogar Gewog

Figure 30 shows the various uses of water sources in Dogar Gewog. The majority of the water sources are primarily used for rural drinking followed by a mixed-use for rural drinking and irrigation (2). Eight of the water sources were recorded as untapped.

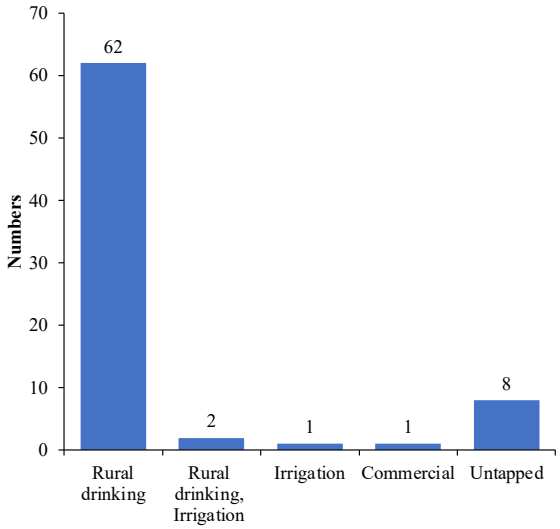

Figure 30: Uses of water sources in Dogar Gewog

As shown in Figure 31, wooden troughs (21) are the most commonly used water source infrastructure in Dogar Gewog followed by drums (12) and concrete intakes (11). The details of other infrastructures are given in the Figure below.

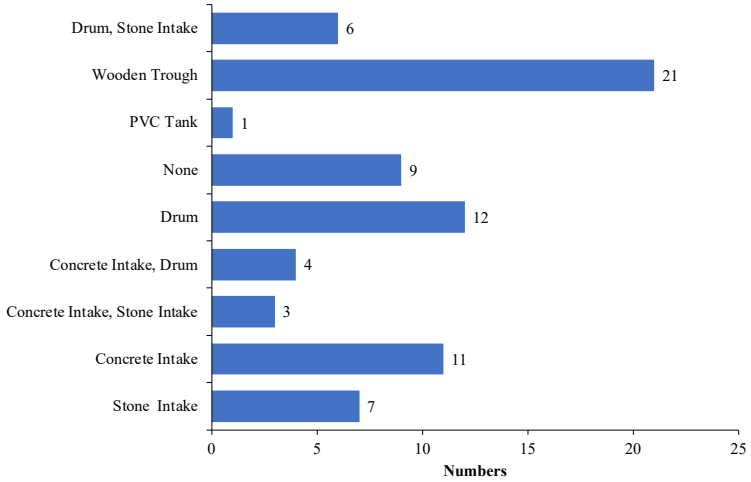

Figure 31: Types of infrastructures at water sources in Dogar Gewog

5.1.2. Dopshari Gewog

Dopshari Gewog recorded a total of 33 surface water sources. This includes 23 water sources previously recorded in 2021 and an additional 10 water sources newly identified during this inventory. Among the sources, two distinct types were identified (Figure 32). Springs accounted for the majority, making up 81.82% (27) of the total, followed by streams at 18.18% (6). Out of the 33 sources, 31 sources are perennial, one source is seasonal and the temporal availability for one source could not be determined.

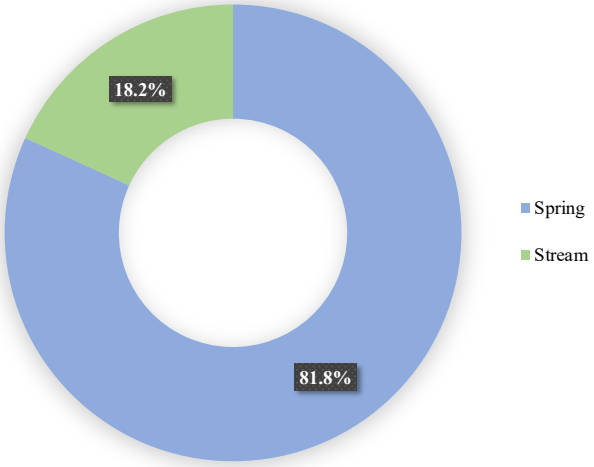

Figure 32: Types of water sources in Dopshari Gewog

Out of the 33 water sources recorded in Dopshari Gewog, 3.03% (1) has dried, 51.52% (17) sources are drying, 9.09% (3) sources show no change in their discharges, while 36.36% (12) sources have increased discharges. The location and status of the water sources are depicted in the map (Figure 33).

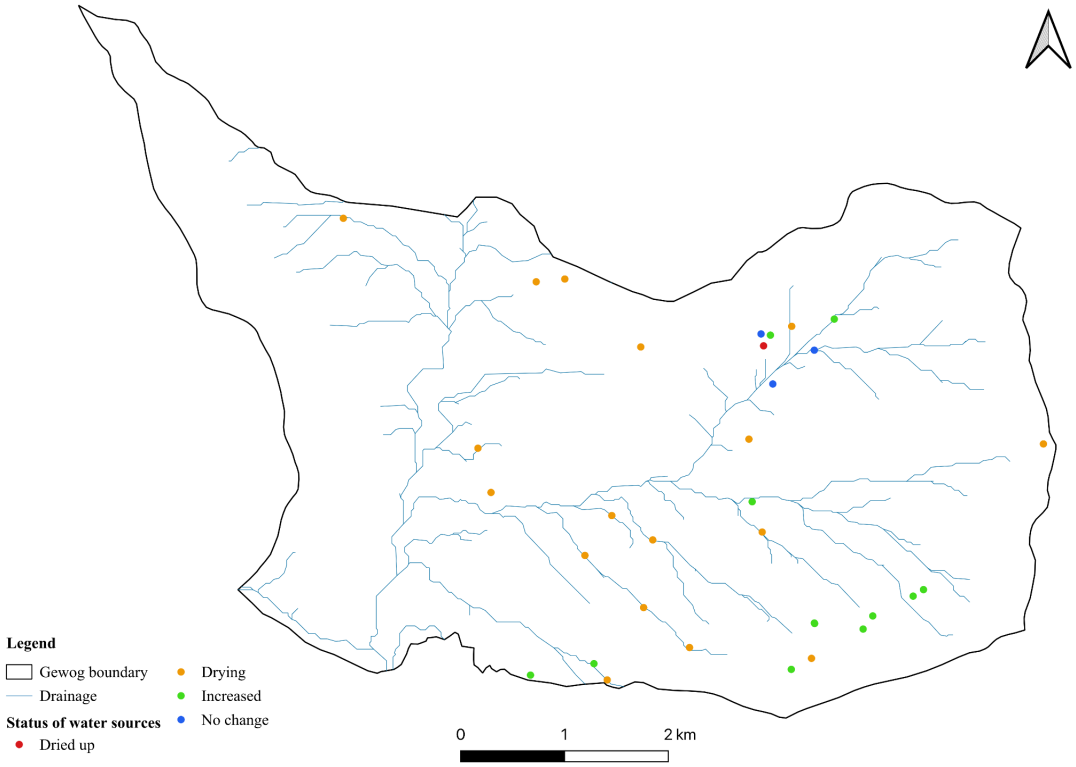

Figure 33: Map showing the status of water sources in Dopshari Gewog

Dopshari Gewog recorded a total of 17 drying and one dried up water sources. Forest degradation and deforestation activities (6) were identified as one of the main factors contributing to the drying water sources (Figure 34). Other factors include climate change, earthquakes and other anthropogenic activities including livestock rearing while the causes could not be determined for three of the water sources.

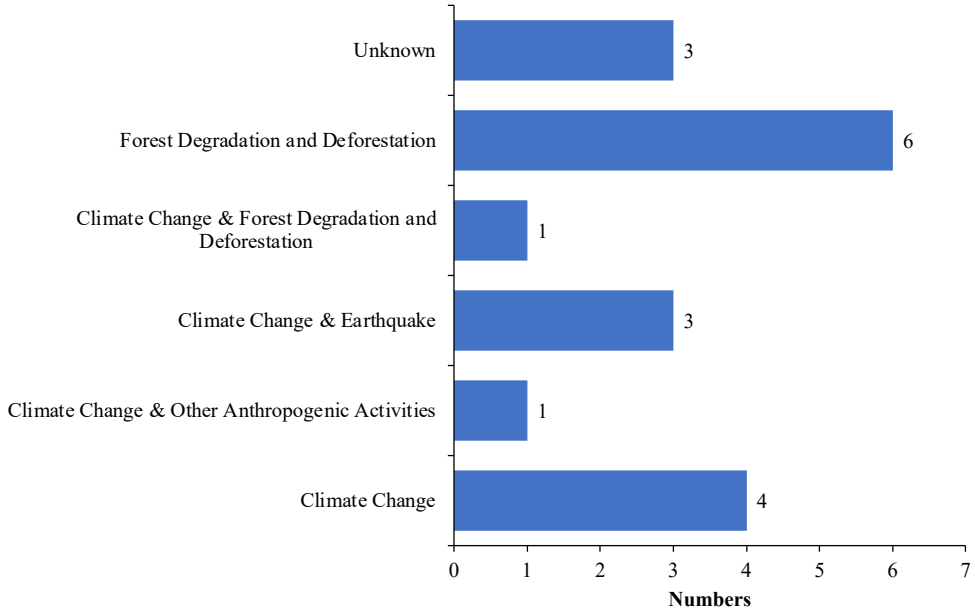

Figure 34: Causes of water sources depletion in Dopshari Gewog

As shown in the Figure 35, 36.36% (12) of the micro-watersheds associated with water sources in Dopshari Gewog are classified as being in a Pristine condition. 39.40% (13) of the micro-watersheds are categorized as Normal, and 24.24% (8) identified under the Degraded category.

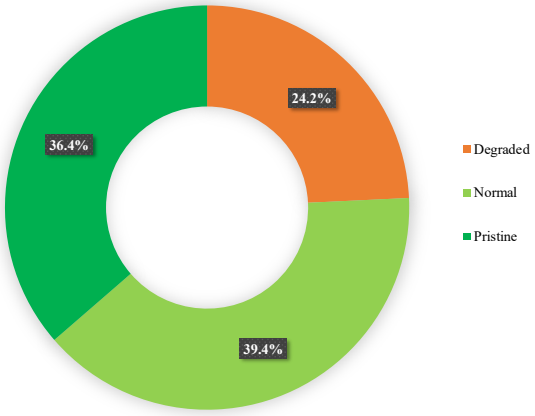

Figure 35: Watershed classification for water sources in Dopshari Gewog

Of the 33 water sources under Dopshari Gewog, the majority of water sources is located within Blue Pine Forests (22) followed by Hemlock Forests (7). There is no water source inside Juniper Rhododendron Scrub, Evergreen Oak Forests and Cool Broadleaved Forests (Figure 36)

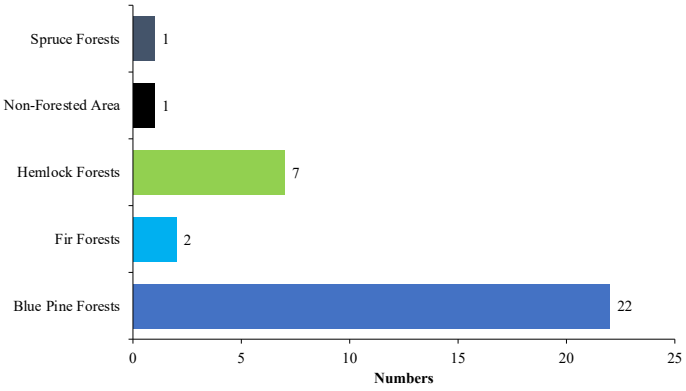

Figure 36: Water sources under different forest types in Dopshari Gewog

Figure 37 shows the number of water sources in Dopshari Gewog categorized by their uses. A total of 25 water sources is used for rural drinking, which is the highest in the Gewog followed by untapped and irrigation sources with three water sources each. Two of the water sources are used for both rural drinking and irrigation.

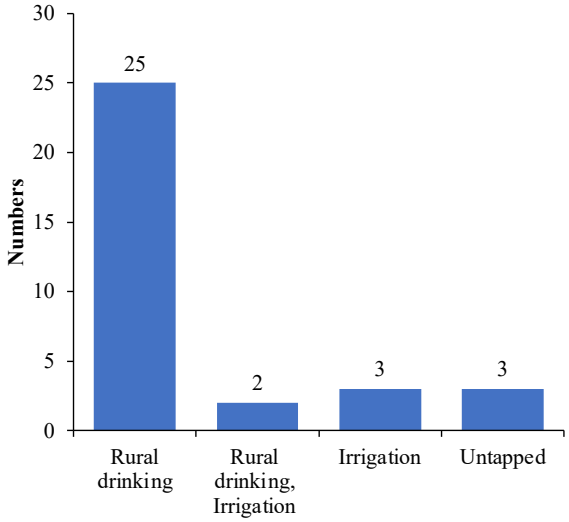

Figure 37: Uses of water sources in Dopshari Gewog

The distribution of different types of water source infrastructure in Dogar Gewog is shown in the Figure 38. The most common infrastructure is Concrete Intake, Stone Intake (10). Nine water sources have no infrastructure at all. The details of other infrastructures are given in the Figure below.

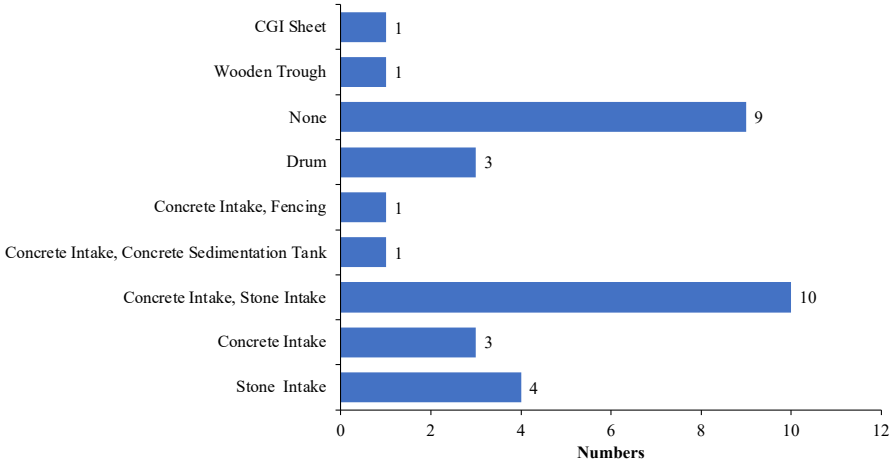

Figure 38: Types of infrastructures at water source in Dopshari Gewog

5.1.3. Doteng Gewog

Doteng Gewog recorded a total of 45 surface water sources. This includes 20 water sources previously recorded in 2021 and an additional 25 newly identified sources during this inventory. Among the sources, three distinct types were identified (Figure 39). Streams accounted for the majority, making up 62.22% (28) of the total, followed by springs at 24.44% (11), while marsh/swamp constituted 13.33% (6) of the total recorded sources. Out of the 45 sources, 44 sources are perennial, with only one source recorded as seasonal.

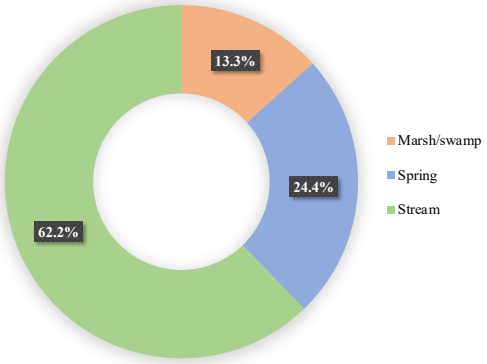

Figure 39: Types of water sources in Doteng Gewog

Out of the 45 water sources recorded in Doteng Gewog, 2.22% (1) has dried, 24.44% (11) sources are drying, 37.78% (17) sources show no change in their discharges, 24.44% (11) sources have increased discharges and the status of discharge from 24.44% (11) of the sources could not be ascertained. The location and status of these water sources are depicted in the map (Figure 40).

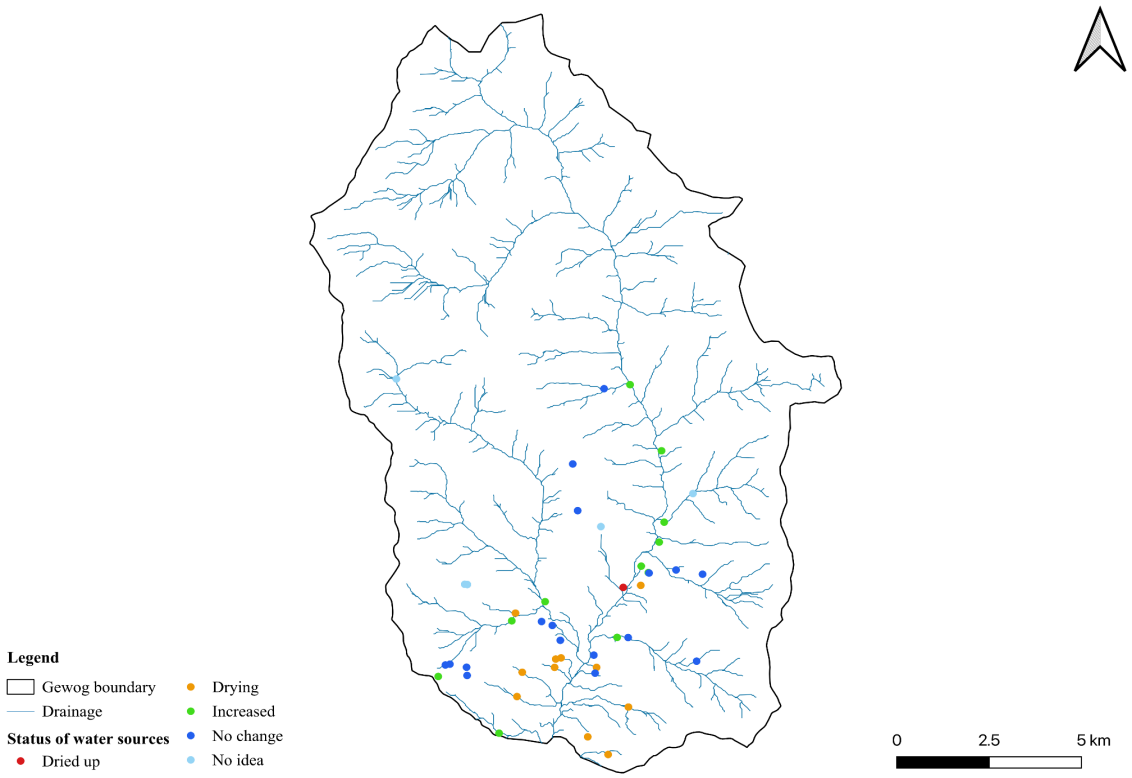

Figure 40: Map showing the status of water sources in Doteng Gewog

Doteng Gewog recorded a total of 11 drying and one dried up water source. Three main causes contributing to the drying of water sources in Doteng Gewog were identified (Figure 41). Climate change accounted for three of the drying water sources followed by other anthropogenic activities (2) and a combination of climate change and forest degradation and deforestation activities (1). However, the majority of the drying water sources (6) had no identifiable cause.

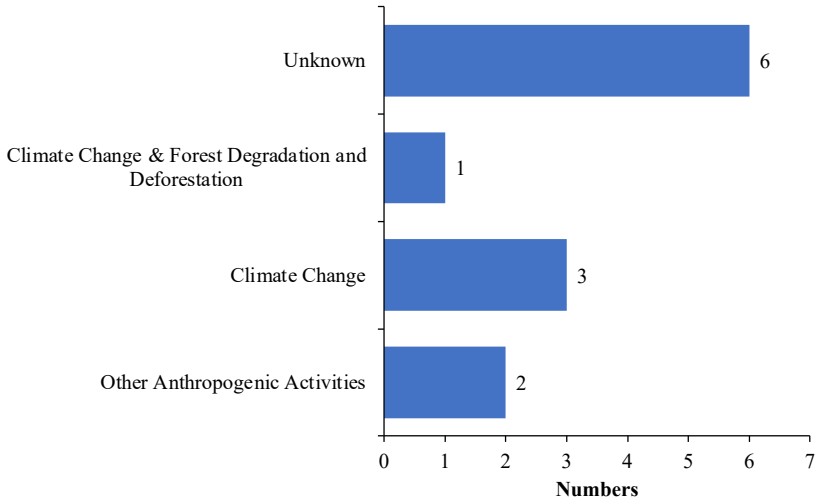

Figure 41: Causes of water sources depletion in Doteng Gewog

As shown in the Figure 42, 77.78% (35) of the micro-watersheds associated with water sources under Doteng Gewog are classified as being in a Pristine condition, followed by 20% (9) categorized as Normal, and 2.22% (1) identified under the Degraded category.

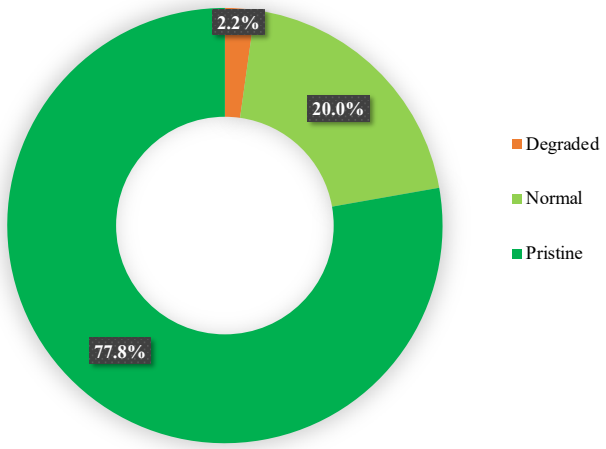

Figure 42: Watershed classification for water sources in Doteng Gewog

Of the 45 water sources under Doteng Gewog, 27 water sources are recorded in Blue Pine Forests followed by Hemlock Forests (7) and Spruce Forests (6). Only one water source was recorded from Juniper Rhododendron Scrub (Figure 43).

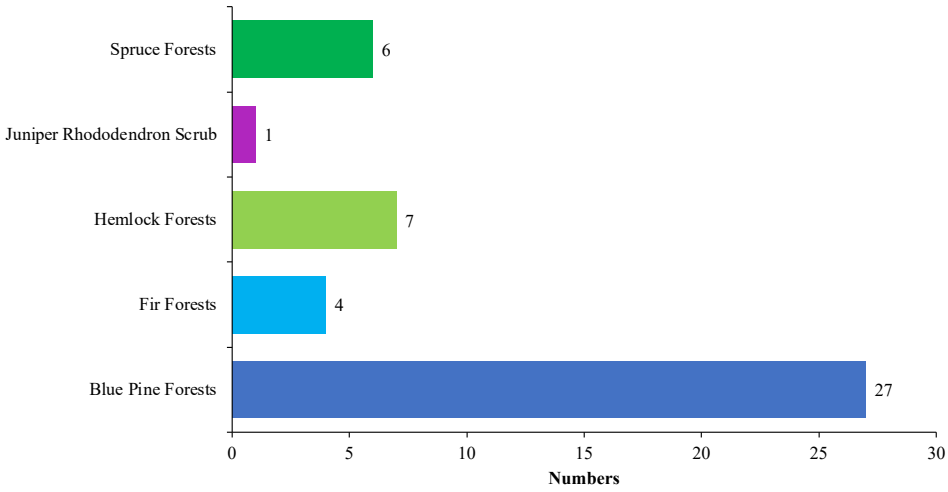

Figure 43: Water sources under different forest types in Doteng Gewog

Figure 44 shows the number of water sources in Doteng Gewog categorized by their uses. A total of 29 water sources is used for rural drinking, which is the highest in the Gewog followed by untapped and mixed-use of the source for rural drinking and irrigation (4).

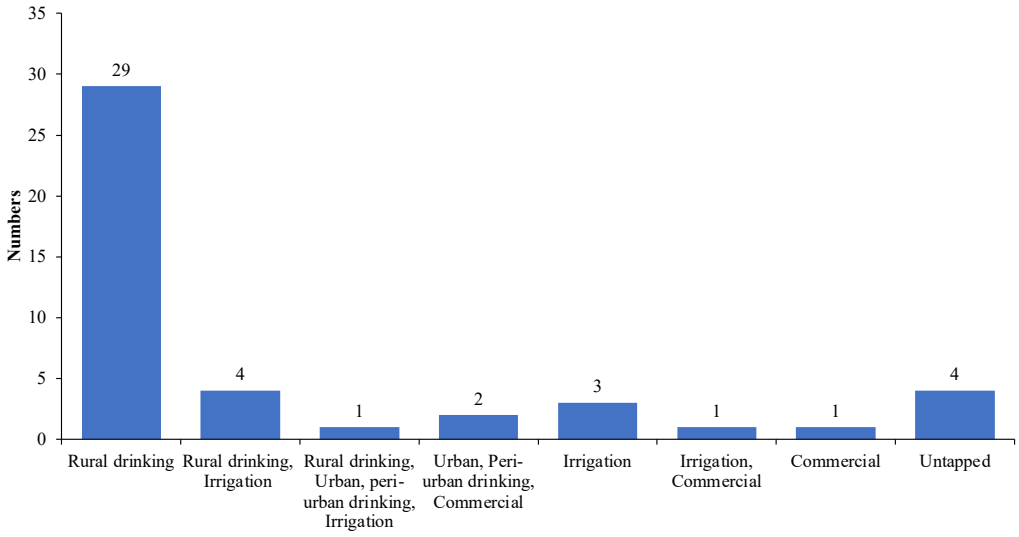

Figure 44: Uses of water sources in Doteng Gewog

In Doteng Gewog, the most common type of water source infrastructure recorded is stone intakes (10). However, maximum of the water sources lacked any infrastructure in place (13). Details of the other infrastructures are given in the Figure 45.

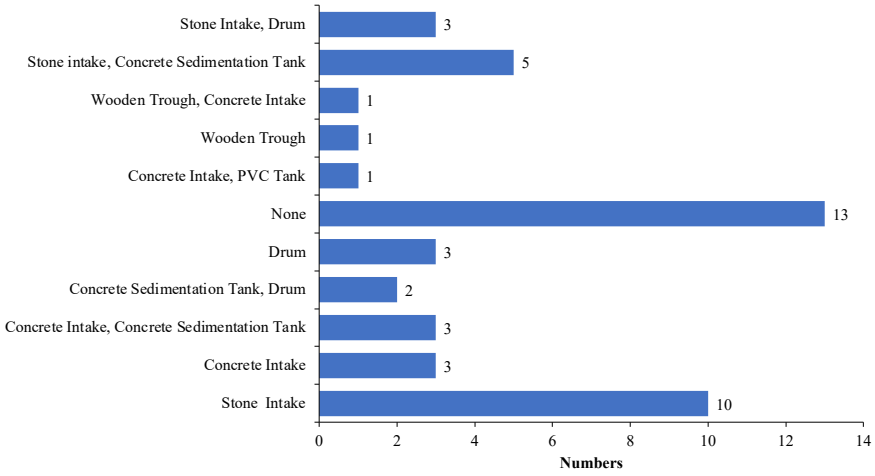

Figure 45: Types of infrastructures at water sources in Doteng Gewog

5.1.4. Hungrel Gewog

Hungrel Gewog recorded a total of 11 surface water sources. This includes eight water sources previously recorded in 2021 and an additional three water sources newly identified during this inventory. Among the sources, two distinct types were identified (Figure 46). Springs accounted for the majority, making up 90.91% (10) of the total, while ponds constituted only 9.09% (1) of the total recorded sources. All the sources were recorded as perennial.

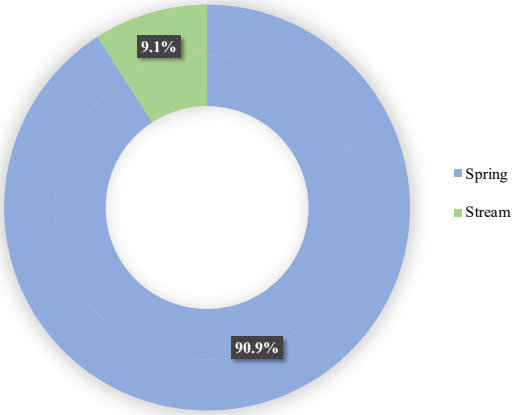

Figure 46: Types of water sources in Hungrel Gewog

A total of 11 water sources were recorded in Hungrel Gewog. From these sources, 72.73% (8) water sources in the Gewog are drying, 9.09% (1) sources show no change in its discharge and 18.18% (2) sources have increased discharges. The location and status of these sources are depicted in the map (Figure 47).

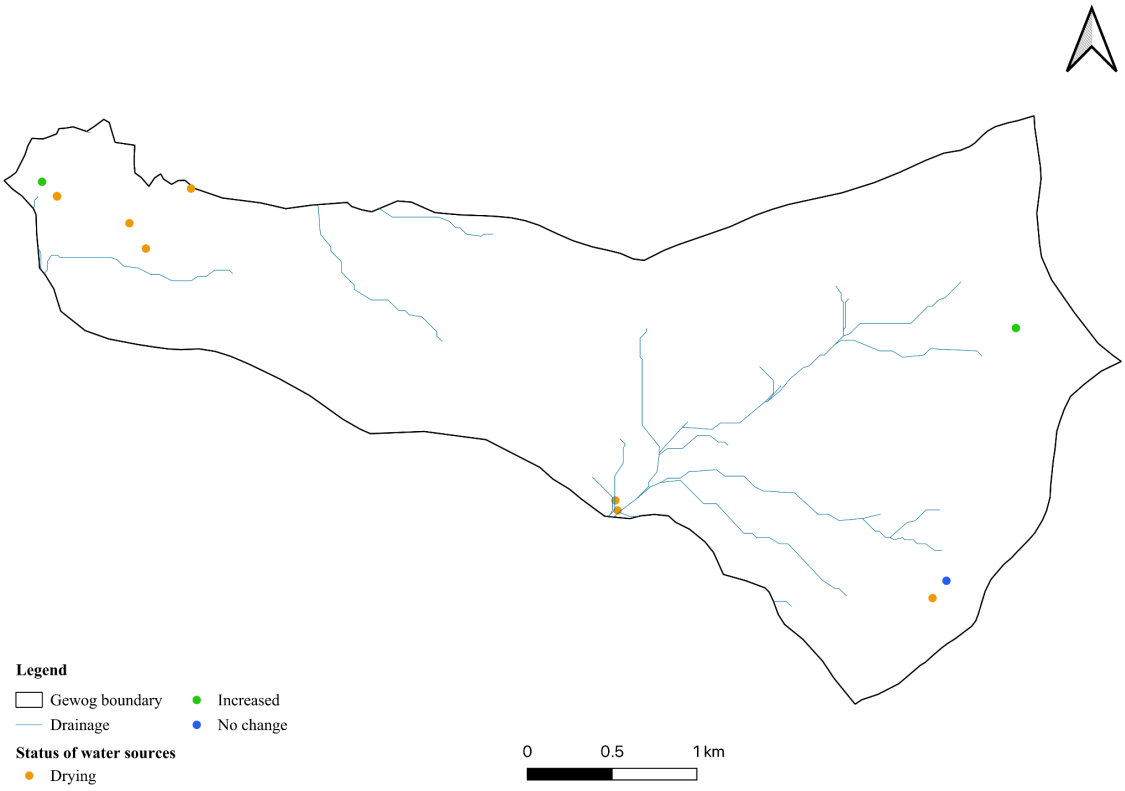

Figure 47: Map showing the status of water sources in Hungrel Gewog

A total of eight drying water sources were recorded in Hungrel Gewog. The majority of the drying water sources was driven by a combination of climate change and earthquakes (3), followed by the combined impact of climate change and anthropogenic activities (2). However, causes for three of the drying water sources were not known (Figure 48).

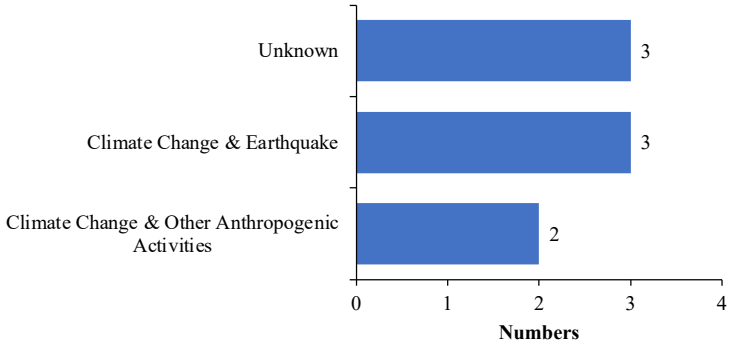

Figure 48: Causes of water sources depletion in Hungrel Gewog

The percentage of the water sources of Hungrel Gewog categorized under the Degraded and Normal risk categories for watersheds is 36.36% (4) each. The remaining 27.27% (3) fall under the Pristine category (Figure 49).

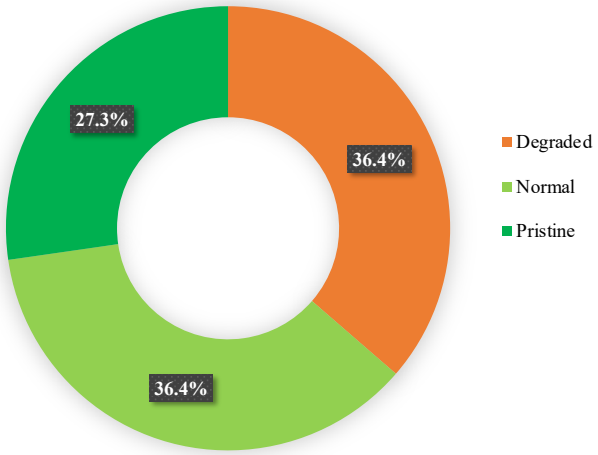

Figure 49: Watershed classification for water sources in Hungrel Gewog

Of the 11 water sources recorded under Hungrel Gewog, seven were located in Blue Pine Forests, three in Cool Broadleaved Forest and one inside Fir Forests (Figure 50).

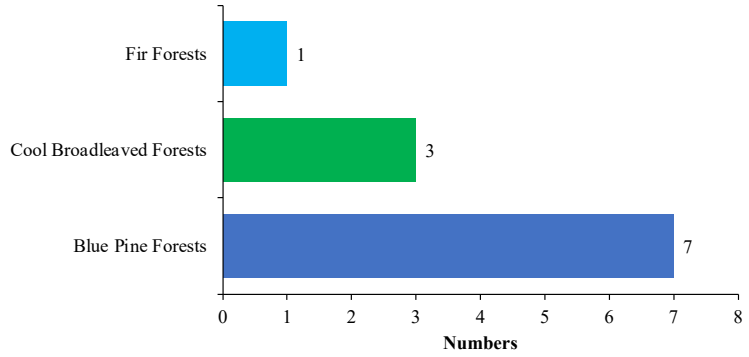

Figure 50: Water sources under different forest types in Hungrel Gewog

The Figure 51 shows the number of water sources in Hungrel Gewog categorized by their uses. Of the 11 water sources, 6 water sources are used for rural drinking, which is the highest in the gewog followed by untapped (4) and a combination of rural drinking and irrigation (1) uses.

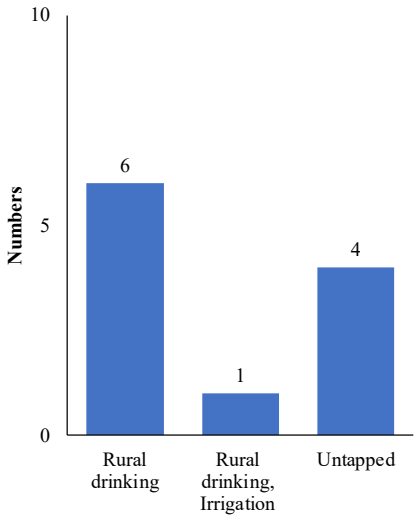

Figure 51: Uses of water sources in Hungrel Gewog

Figure 52 shows the type of infrastructure present at the water sources in Hungrel Gewog. The most common infrastructure recorded is concrete intakes (5). However, five of the water sources did not have any infrastructure in place. The details of other infrastructure are given in the Figure below.

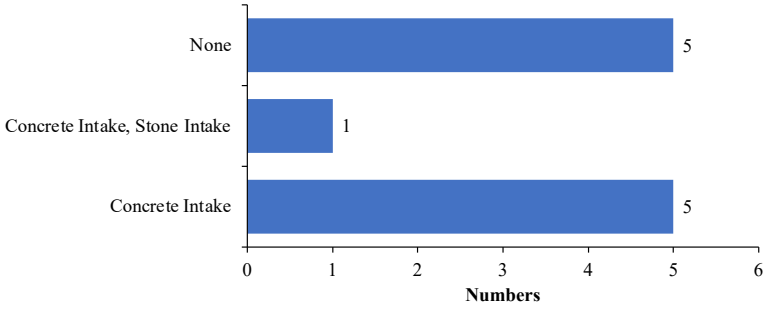

Figure 52: Types of infrastructures at water sources in Hungrel Gewog

5.1.5. Lamgong Gewog

Lamgong Gewog recorded a total of 19 surface water sources. This includes 13 water sources previously recorded in 2021 and an additional six water sources newly identified during this inventory. Among the sources, two distinct types were identified (Figure 53). Springs accounted for 68.42% (13) of the total, followed by streams at 31.58% (6). All the sources were recorded as perennial.

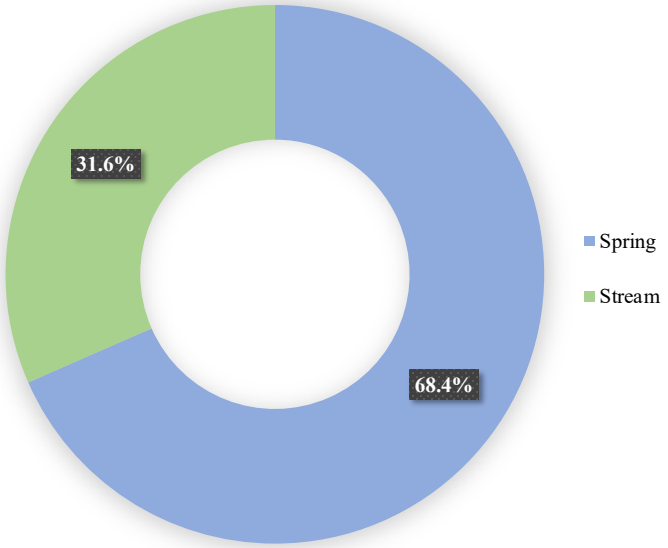

Figure 53: Types of water sources in Lamgong Gewog

There are 19 water sources recorded in Lamgong Gewog. Of these sources, 57.89% (11) are drying, 15.79% (3) sources show no change in its discharge and 26.32% (5) sources have increased discharges. The location and status of these sources are depicted in the map (Figure 54).

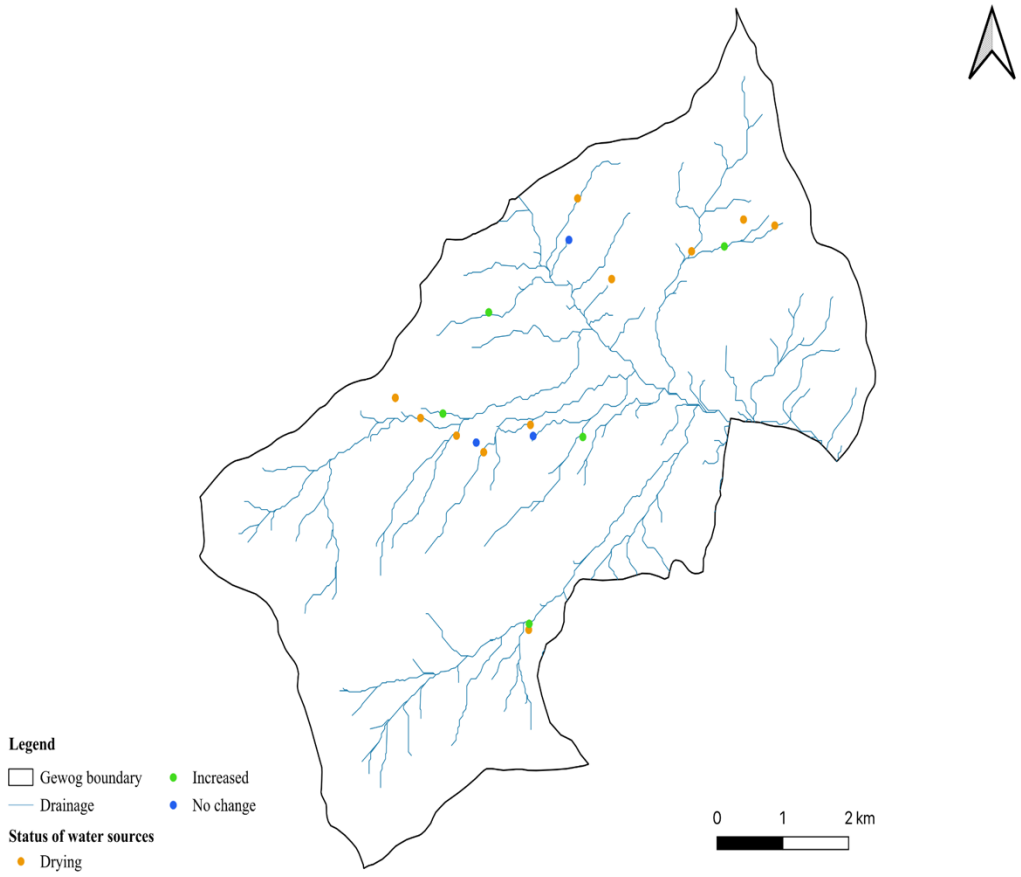

Figure 54: Map showing the status of water sources in Lamgong Gewog

A total of 11 drying water sources were recorded in Lamgong Gewog. Although Figure 55 shows that the predominant causes of drying water sources remained unknown (8), forest degradation and deforestation activities was identified as one of the main causes of drying water sources at Lamgong Gewog (3).

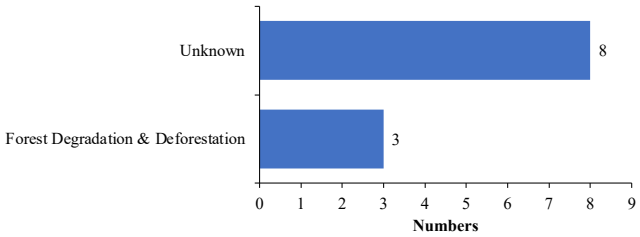

Figure 55: Causes of water sources depletion in Lamgong Gewog

52.63% (10) of the micro-watersheds for the water sources under Lamgong Gewog are classified under the Normal risk category (Figure 56). The watersheds under the Degraded category are 26.32% (5).

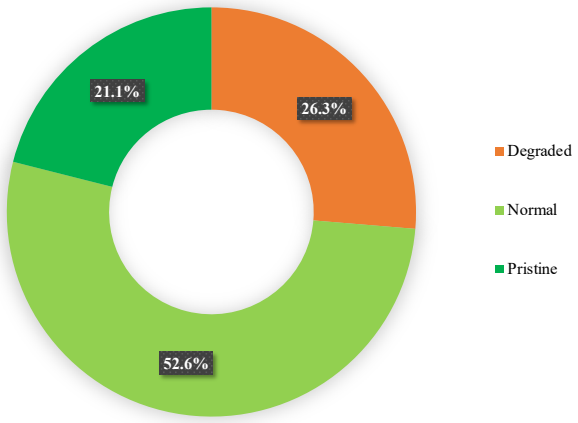

Figure 56: Watershed classification for water sources in Lamgong Gewog

Only 19 water sources were recorded under Lamgong Gewog. Of these, 18 sources were located within Blue Pine Forests and one source under Hemlock Forests as presented in Figure 57.

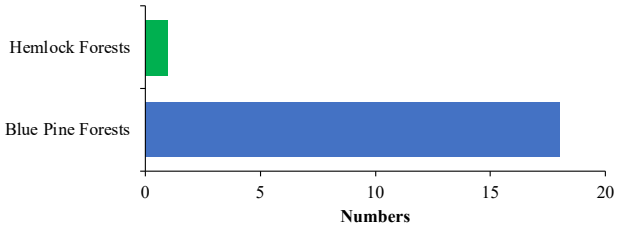

Figure 57: Water sources under different forest types in Lamgong Gewog

Figure 58 shows that most water sources in Lamgong Gewog are used for rural drinking (9), followed by use for irrigation and mixed-use for rural drinking and irrigation (3). Three of the water sources are recorded as untapped.

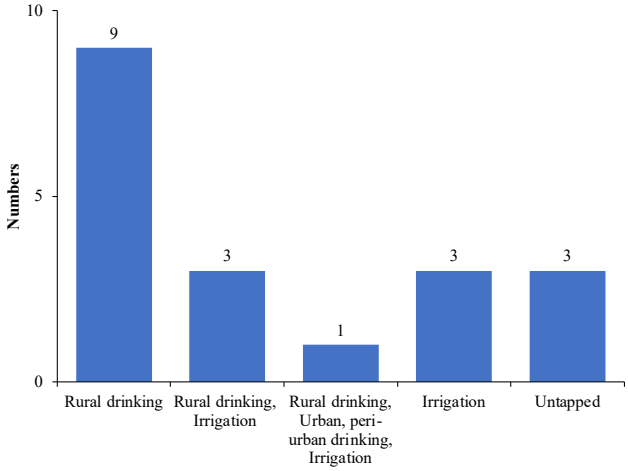

Figure 58: Uses of water sources in Lamgong Gewog

Figure 59 shows the number of water sources infrastructure in Lamgong Gewog. The most common infrastructure recorded is concrete intakes (4) followed by concrete sedimentation tanks (3) and a combination of concrete and stone intakes (3). However, the majority of the sources recorded no infrastructure in place. The details of other infrastructure are given in the Figure below.

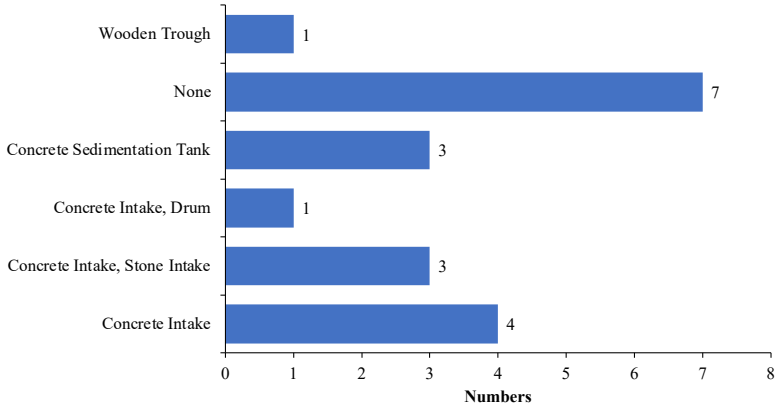

Figure 59: Types of infrastructures at water sources in Lamgong Gewog

5.1.6. Lungnyi Gewog

Lungnyi Gewog recorded a total of 57 surface water sources. This includes 38 water sources previously recorded in 2021 and an additional 19 water sources newly identified during this inventory. Among the sources, four distinct types were identified (Figure 60). Springs accounted for the majority, making up 68.42% (39) of the total, followed by streams at 22.81% (13), while marsh/swamp constituted 7.02% (4) and Lakes constituted only 1.75% (1). Out of the 57 sources, 55 sources are perennial, while one source is seasonal and the temporal availability for one source could not be determined.

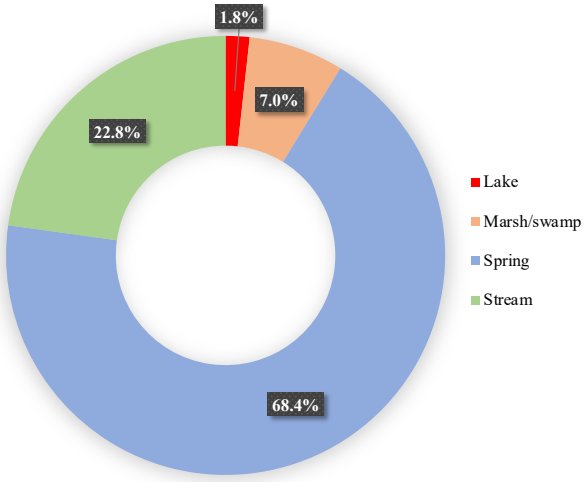

Figure 60: Types of water sources in Lungnyi Gewog

There are 57 water sources recorded in Lungnyi Gewog. Out of these sources, 1.75% (1) have dried, 31.58% (18) sources are drying, 24.56% (14) sources show no change in their discharges, 36.84% (21) sources have increased discharges while the status of discharges from the 5.26% (3) source could not be determined. The location and status of these sources are depicted in the map (Figure 61).

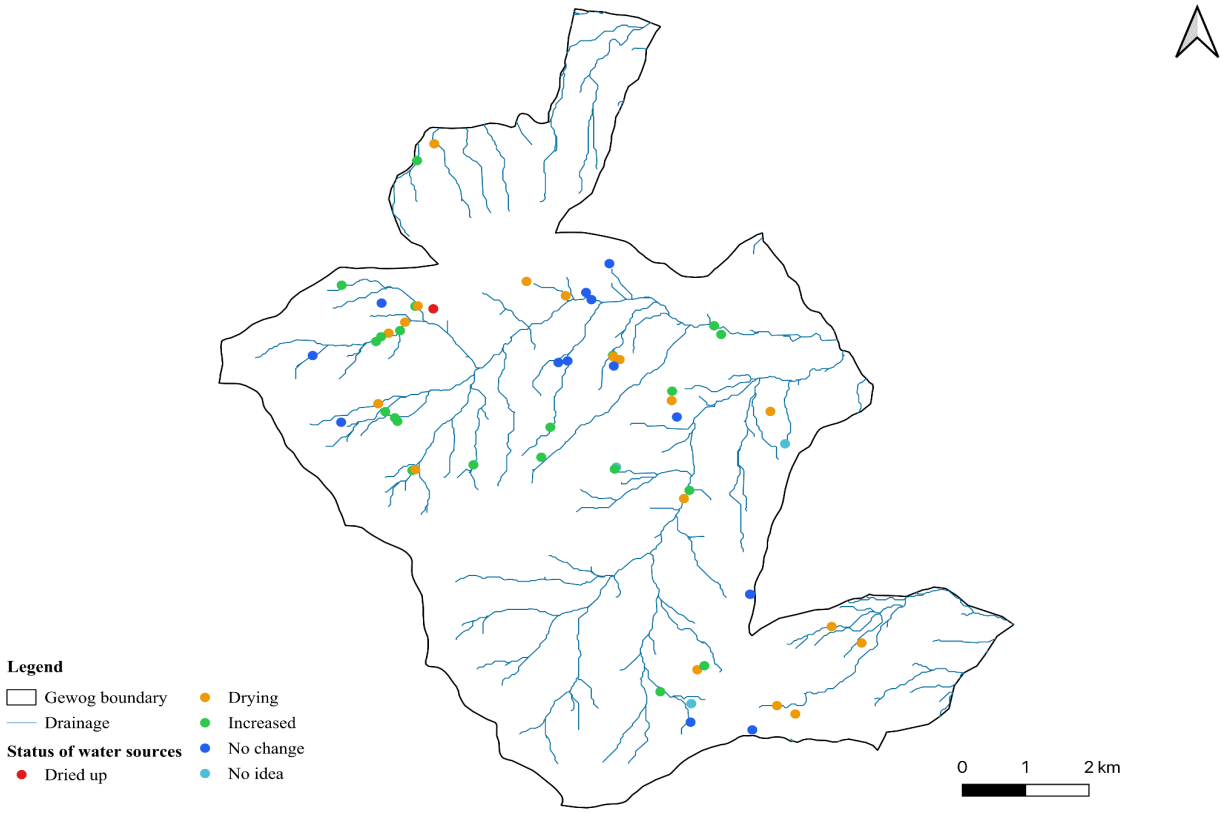

Figure 61: Map showing the status of water sources in Lungnyi Gewog

A total of 18 drying and one dried up water source were recorded in Lungnyi Gewog. Although the maximum (18) of the causes for the drying water sources could not be determined, forest degradation and deforestation activities were found to be affecting one of the drying water sources in Lungnyi Gewog (Figure 62).

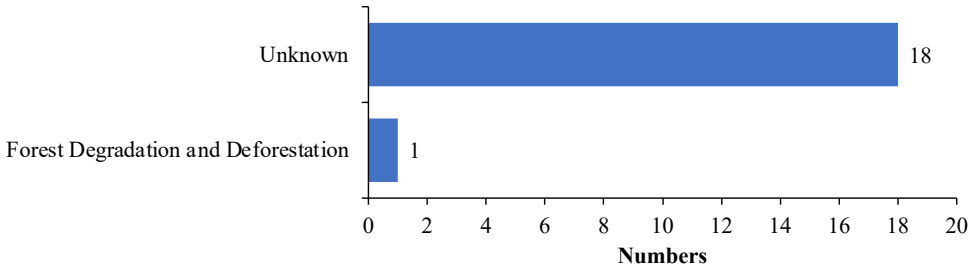

Figure 62: Causes of water sources depletion in Lungnyi Gewog

73.68% (42) of the 57 micro-watersheds of the water sources under Lungnyi Gewog fall under the Normal risk category while 15.79% (9) of the micro-watersheds fall under the Degraded category (Figure 63).

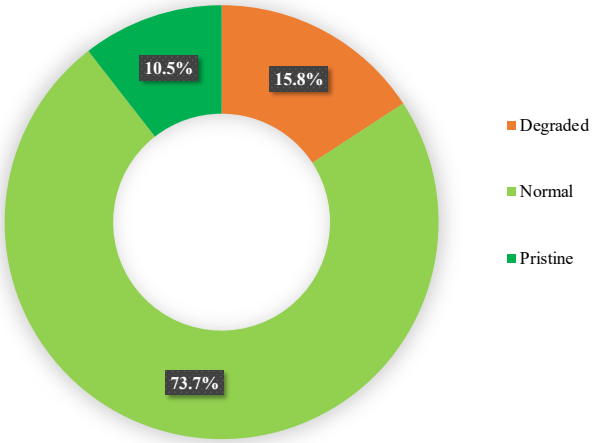

Figure 63: Watershed classification for water sources in Lungnyi Gewog

Of the 57 water sources recorded under Lungnyi Gewog, 26 sources are located inside Blue Pine Forests while 24 sources are inside Spruce Forests (Figure 64). The other two forest types with water sources are Fir Forests (5) and Hemlock Forests (2).

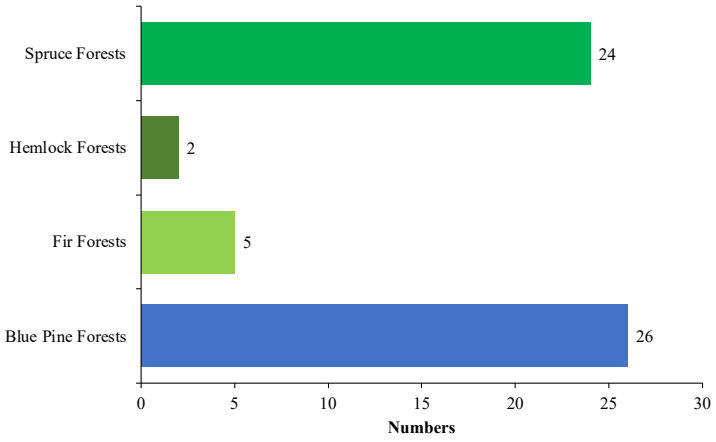

Figure 64: Water sources under different forest types in Lungnyi Gewog

Of the 57 water sources in Lungnyi gewog, the majority of the water sources are used for rural drinking (20). Other water source use includes irrigation, commercial, urban/peri-urban drinking and other combined uses. Additionally, a total of 24 untapped sources without any infrastructure were also recorded (Figure 65).

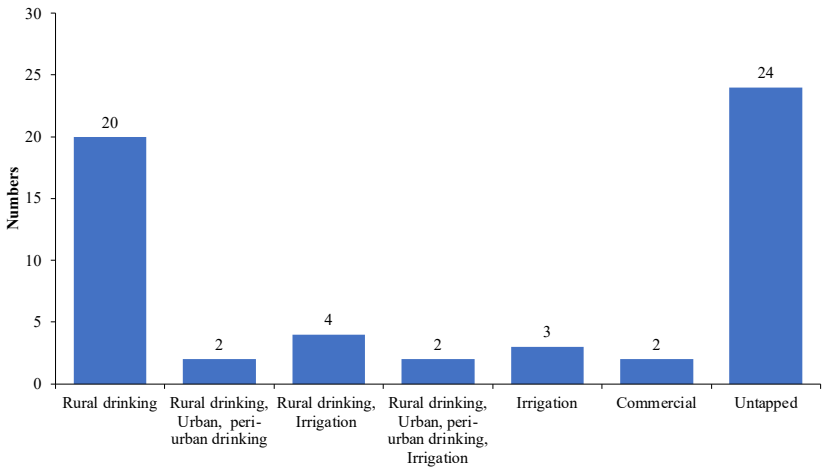

Figure 65: Uses of water sources in Lungnyi Gewog

Figure 66 shows that 33 water sources in Lungnyi Gewog lack any infrastructure. Concrete intakes form the most common type of infrastructure (7) followed by concrete sedimentation tank (5). The details of other infrastructure are given in the Figure below.

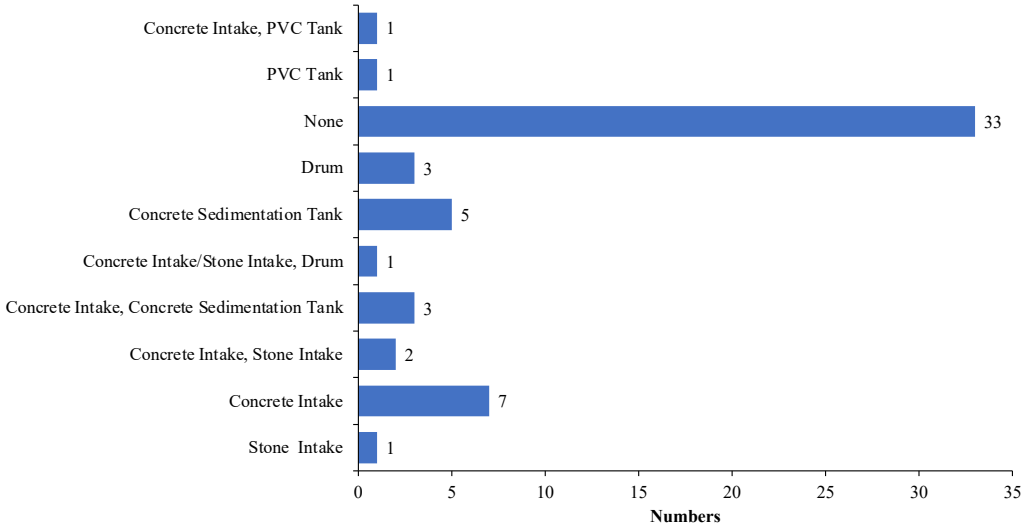

Figure 66: Types of infrastructures at water sources in Lungnyi Gewog

5.1.7. Naja Gewog

Naja Gewog recorded a total of 57 surface water sources. This includes 19 water sources previously recorded in 2021 and an additional 38 waters sources newly identified during this inventory. Among the sources, four distinct types were identified (Figure 67). Springs accounted for the majority, making up 57.89% (33) of the total, followed by streams at 38.60% (22), while ponds constituted 1.75% (1) and marsh/swamp constituted 1.75% (1) each. Out of the 57 sources, 55 sources are perennial, one source is seasonal while the temporal availability for one source could not be determined.

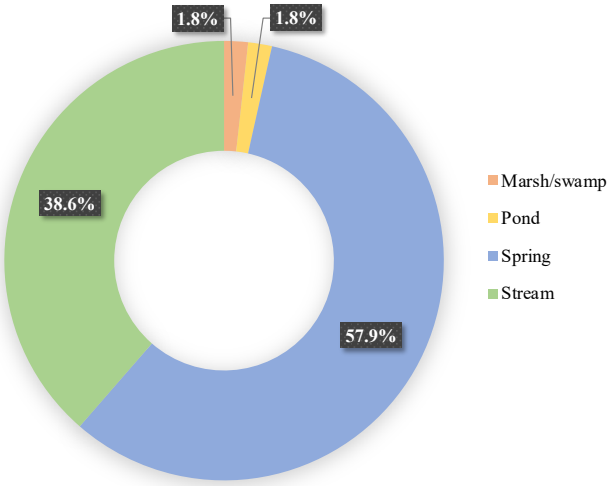

Figure 67: Types of water sources in Naja Gewog

There are 57 water sources recorded in Naja Gewog. Out of these, 1.75% (1) water sources in the Gewog have dried, 15.79% (9) sources are drying, 29.82% (17) sources show no change in their discharges, 8.77% (5) sources have increased discharges while the status of discharges from the 43.86% (25) sources could not be determined. The location and status of these sources are depicted in the map below (Figure 68).

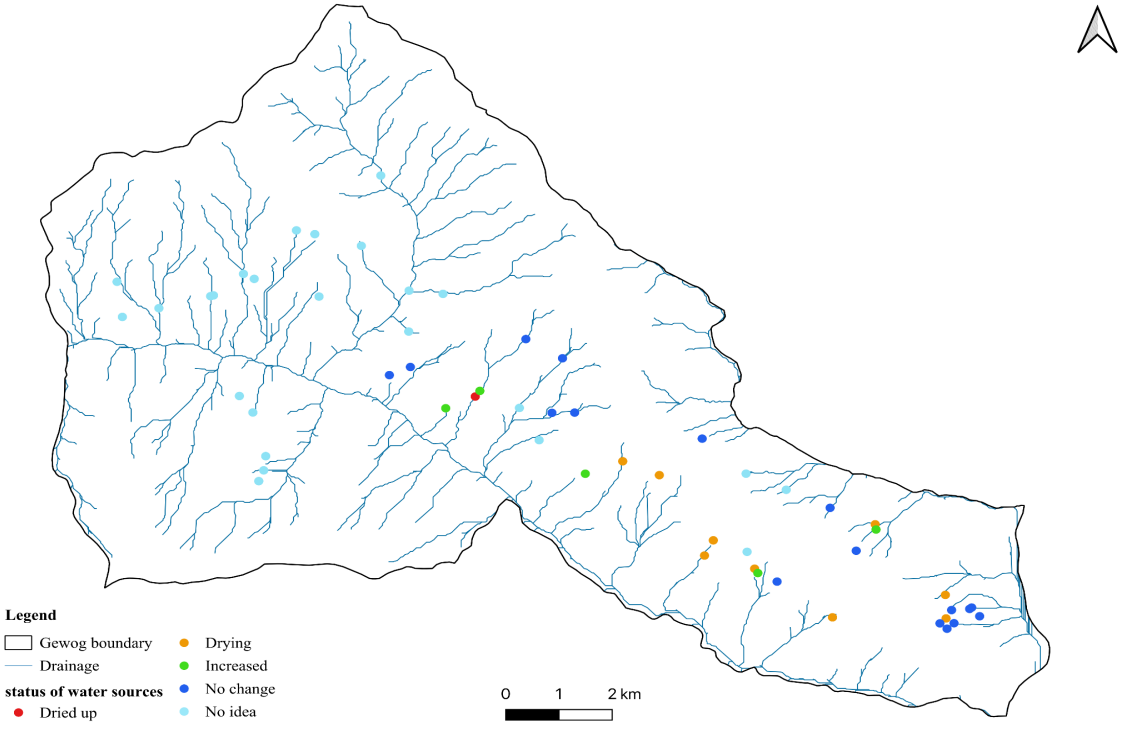

Figure 68: Map showing the status of water sources in Naja Gewog

A total of nine drying and one dried up water source was recorded at Naja Gewog. Forest degradation and deforestation (5) is one of the driving factors for the drying water sources in Naja Gewog followed by climate change (2) and other anthropogenic activities (1). However, the causes for two of the drying water sources could not be determined (Figure 69).

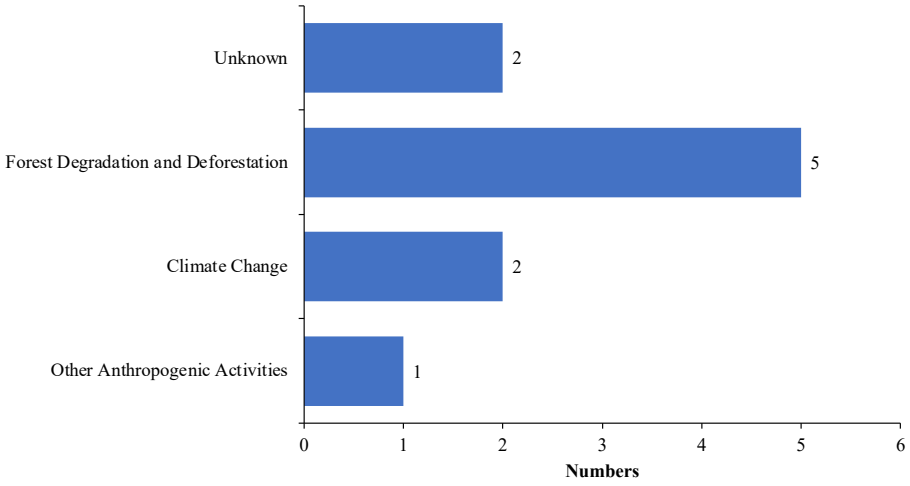

Figure 69: Causes of water sources depletion in Naja Gewog

66.67% (38) of the micro-watersheds of the water sources inventoried under Naja Gewog fall under the Pristine risk category (Figure 70). Only 7.02% (4) of the micro-watersheds fall under the Degraded category while the remaining 26.31% (15) is classified under the Normal category.

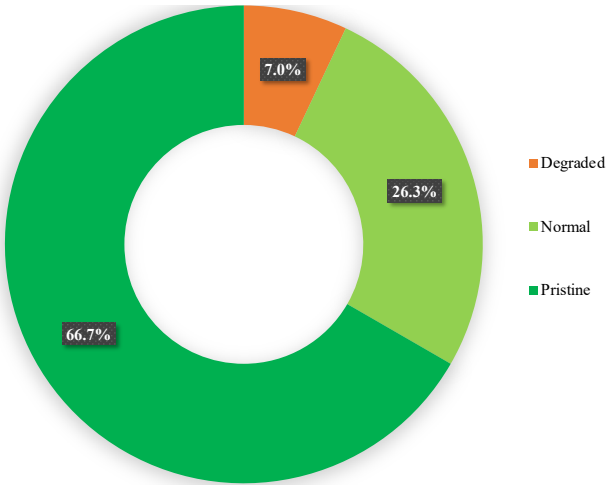

Figure 70: Watershed classification for water sources in Naja Gewog

22 water sources each were recorded from Blue Pine Forests and Hemlock Forests under Naja Gewog with another eight sources recorded from the Non-Forested Area (Figure 71).

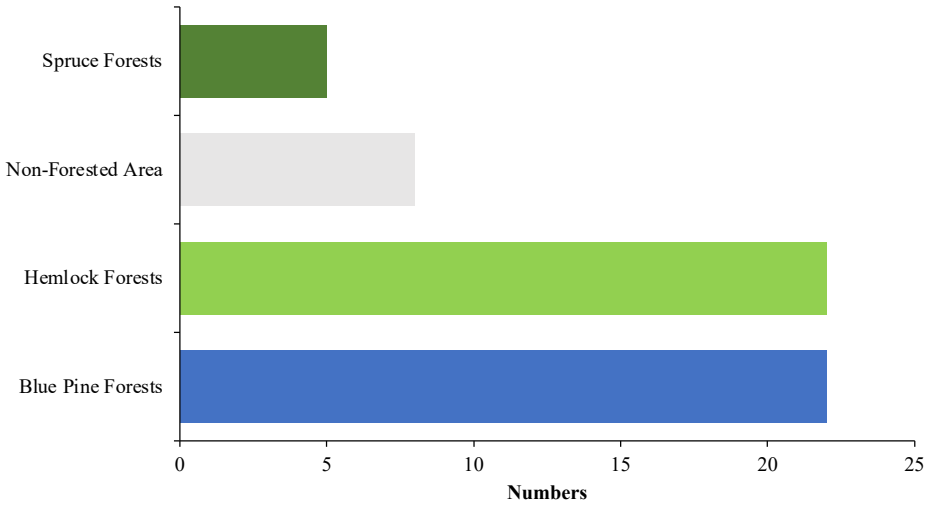

Figure 71: Water sources under different forest types in Naja Gewog

Figure 72 shows that water sources in Naja Gewog are commonly utilized for rural drinking (50), while only a small number is used for irrigation (1). Six of the water sources were found to be untapped.

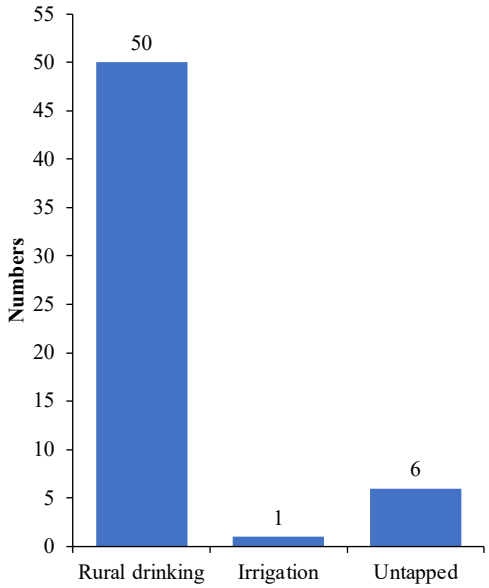

Figure 72: Uses of water sources in Naja Gewog

Figure 73 shows the infrastructure of water sources in Naja Gewog. The most widely used type was concrete intake (27) followed by stone intakes (8) and wooden troughs (4). No infrastructure was recorded for a total of 14 water sources.

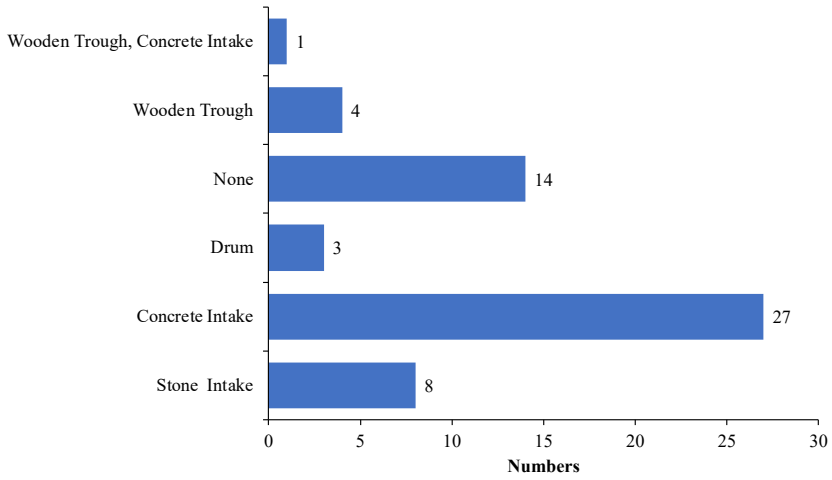

Figure 73: Types of infrastructures at water source in Naja Gewog

5.1.8. Shaba Gewog

Shaba Gewog recorded a total of 40 surface water sources. This includes 25 water sources previously recorded in 2021 and an additional 15 water sources newly identified during this inventory. Among the sources, four distinct types were identified (Figure 74). Springs accounted for the majority, making up 57.50% (23) of the total, followed by ponds at 27.50% (11), while streams constituted 12.50% (5) and marsh/swamp constituted only 2.50% (1). Out of the 40 sources, 29 sources are perennial, two sources are seasonal while the temporal availability for nine sources could not be determined.

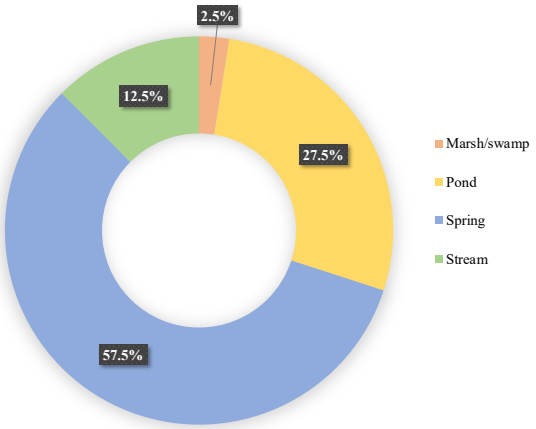

Figure 74: Types of water sources in Shaba Gewog

Of the 40 recorded water sources, 25% (10) have dried, 20% (8) sources are drying, 32.50% (13) sources show no change in their discharges,15% (6) sources have increased discharges while the status of discharges from the 7.50% (3) sources could not be determined. The location and status of these water sources are depicted in the map below (Figure 75).

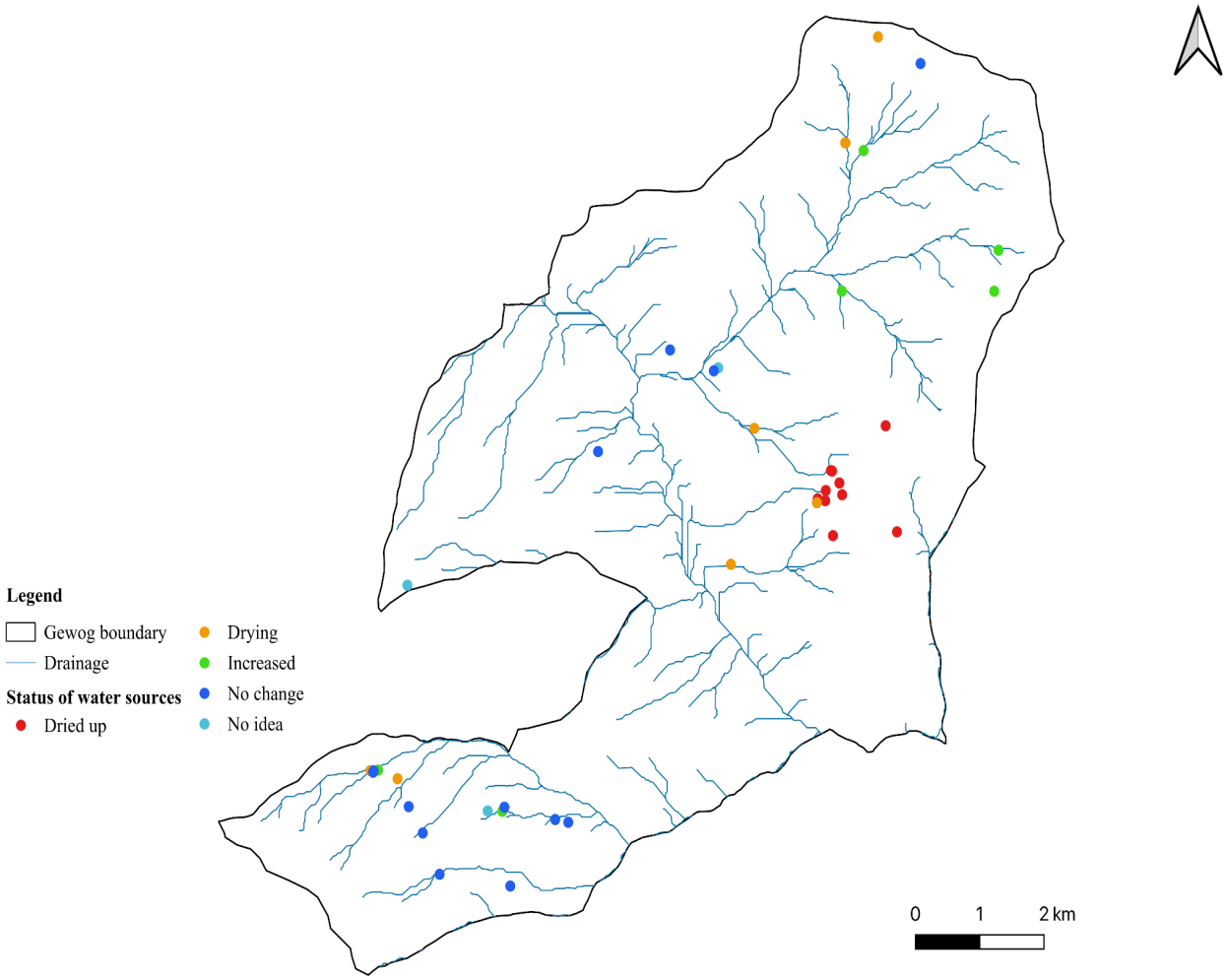

Figure 75: Map showing the status of water sources in Shaba Gewog

Shaba Gewog recorded a total of 10 dried up and eight drying water sources. Climate change (3) was identified as the key factor contributing to declining water sources at Shaba Gewog (Figure 76). However, causes of drying water sources could not be determined for 15 water sources.

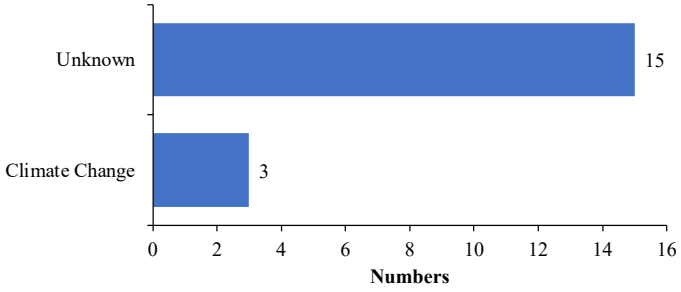

Figure 76: Causes of water sources depletion in Shaba Gewog

19 (47.50%) of the 40 micro-watersheds for the water sources under Shaba Gewog are categorized under the Normal risk category (Figure 77). 32.50% (13) are under the Degraded category and the remaining 20% (8) under the Pristine category.

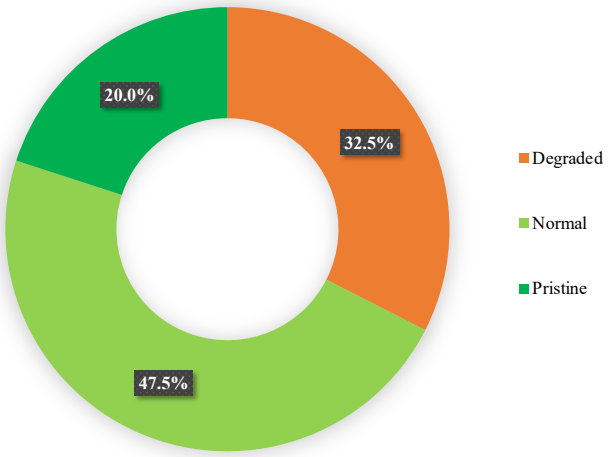

Figure 77: Watershed classification for water sources in Shaba Gewog

Of the 40 water sources recorded under Shaba Gewog, a majority of the sources (17) fall inside Blue Pine Forests followed by nine sources inside Non-Forested Areas and seven inside Spruce Forests. One source each were recorded inside Cool Broadleaved Forests, Evergreen Oak Forests and Juniper Rhododendron Scrub (Figure 78).

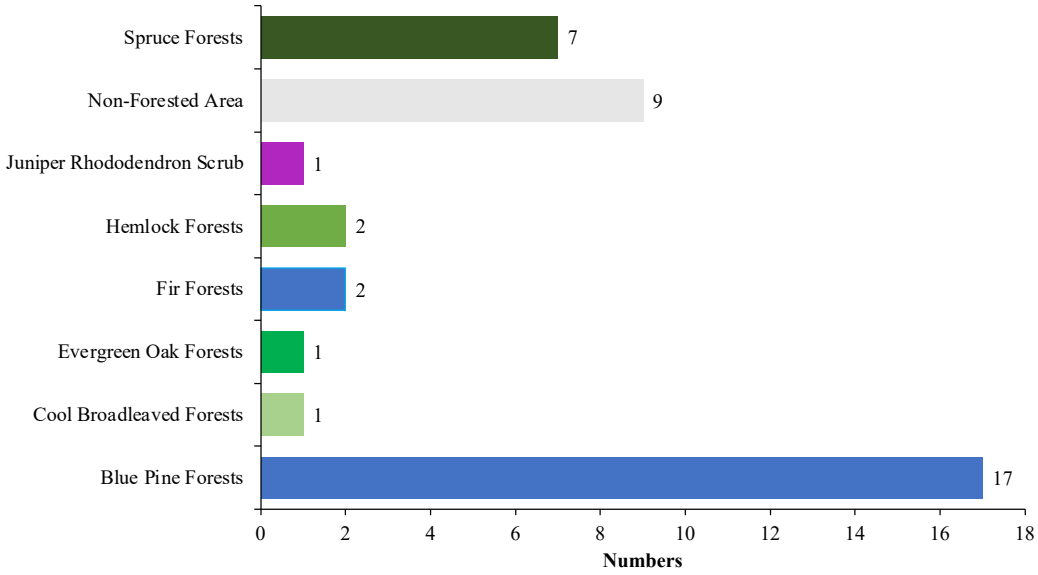

Figure 78: Water sources under different forest types in Shaba Gewog

Figure 79 shows that rural drinking (30) is the most common form of water source use in Shaba Gewog followed by mixed-use for irrigation and rural drinking (6). Additionally, three sources currently untapped were also recorded.

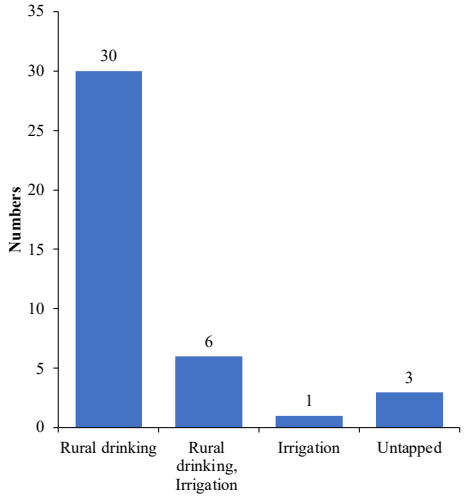

Figure 79: Uses of water sources in Shaba Gewog

Figure 80 shows that from a total of 39 water source infrastructure in Shaba Gewog, 12 sites lacked any formal infrastructure in place. Stone intakes were the most common installed feature (7), followed by concrete intakes (6). Other infrastructure such as PVC tanks, drums, tyre tubes, and wooden troughs was also recorded.

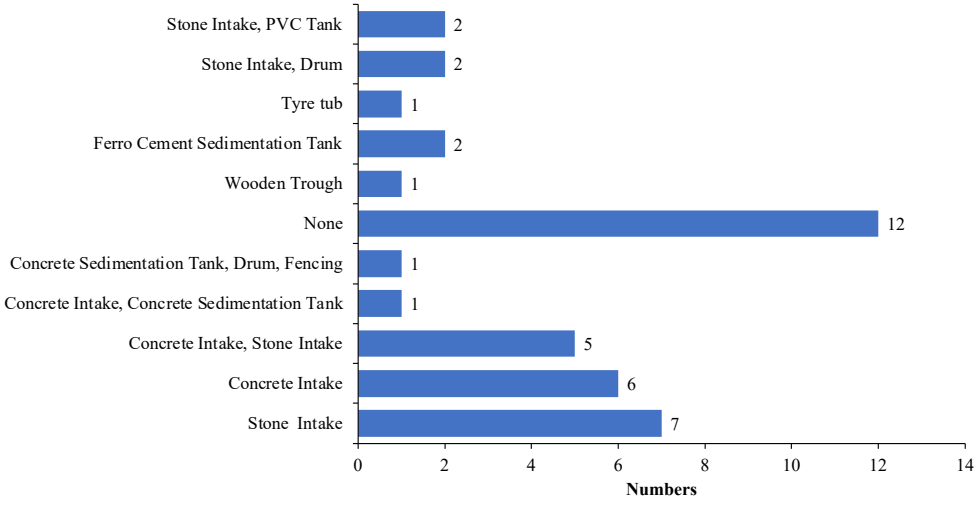

Figure 80: Types of infrastructures at water source in Shaba Gewog

5.1.9. Tsento Gewog

Tsento Gewog recorded a total of 125 surface water sources. This includes 43 water sources previously recorded in 2021 and an additional 82 water sources newly identified during this

inventory. Among the sources, two distinct types were identified (Figure 81). Springs constituted 63.20% (79) of the total, followed by streams at 36.80% (46). Out of the 125 sources, 124 sources are perennial, while only one source is seasonal.

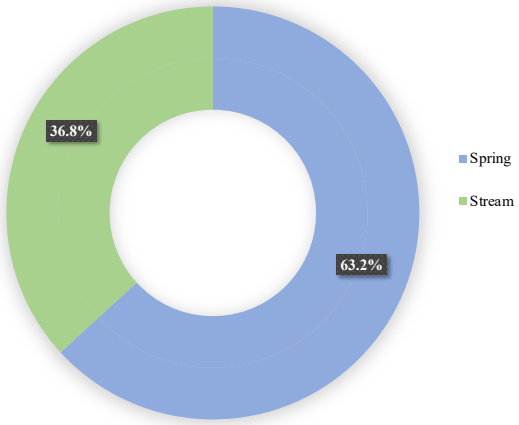

Figure 81: Type of water sources in Tsento Gewog

Of the total recorded water sources, 0.80% (1) have dried, 10.40% (13) sources are drying, 82.40% (103) sources show no change in their discharges, 1.60% (2) sources have increased discharges while the status of discharges from the 4.80% (6) sources could not be determined. The location and status of these water sources are depicted in the map below (Figure 82).

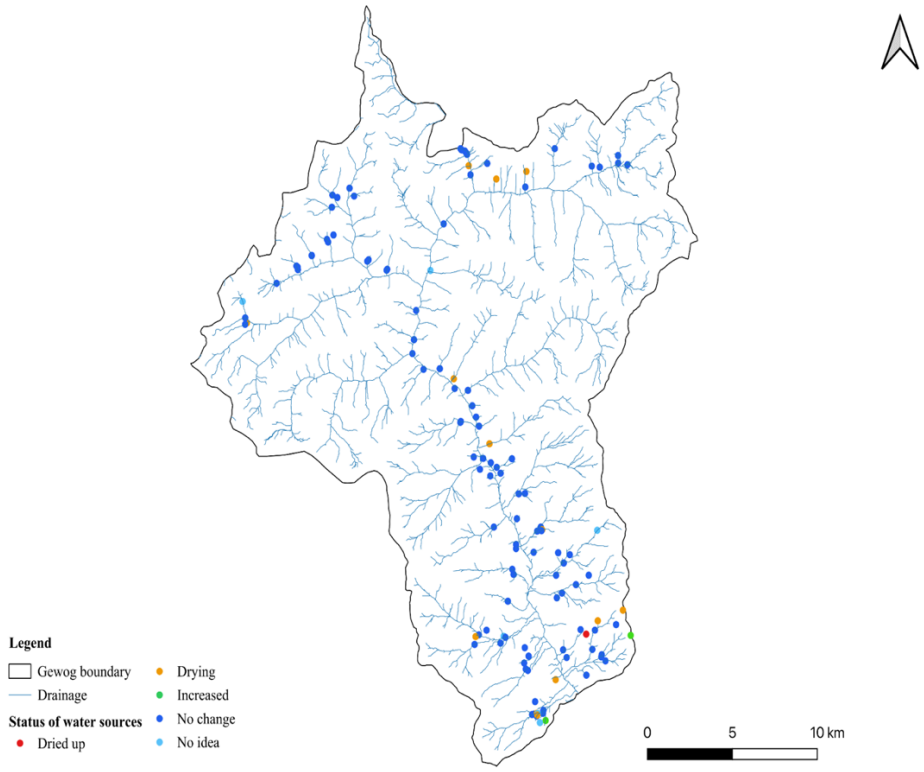

Figure 82: Map showing the status of water sources in Tsento Gewog

A total of 13 drying and one dried up water source was recorded in Tsento Gewog. Climate change (8) was identified as the main factor affecting the drying water sources while causes remained unknown for eight of the drying water sources (Figure 83).

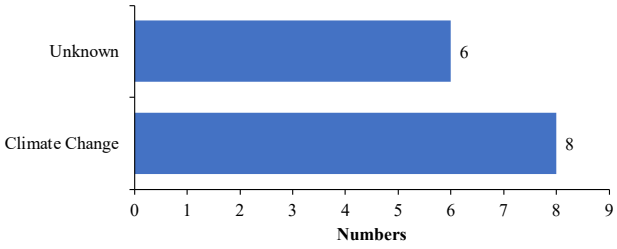

Figure 83: Causes of water sources depletion in Tsento Gewog

Of the 125 water sources under Tsento Gewog, 65 water sources corresponding to 52% fall under the Normal risk category of the watersheds (Figure 84). Another 44% (55) are classified under the Pristine category.

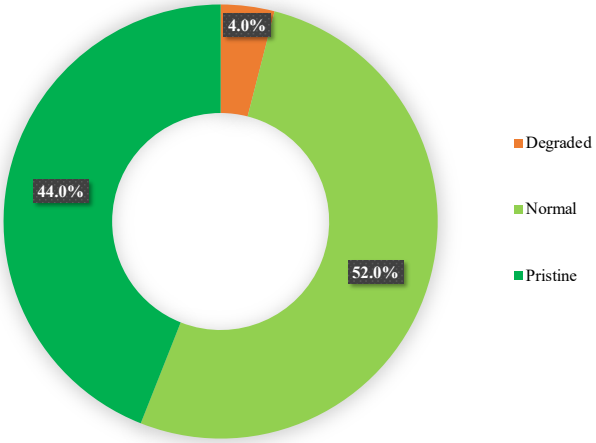

Figure 84: Watershed classification for water sources in Tsento Gewog

59 of the 125 water sources in Tsento Gewog fall inside the Blue Pine Forests (Figure 85). The least number (1) of water sources is recorded from the Cool Broadleaved Forests.

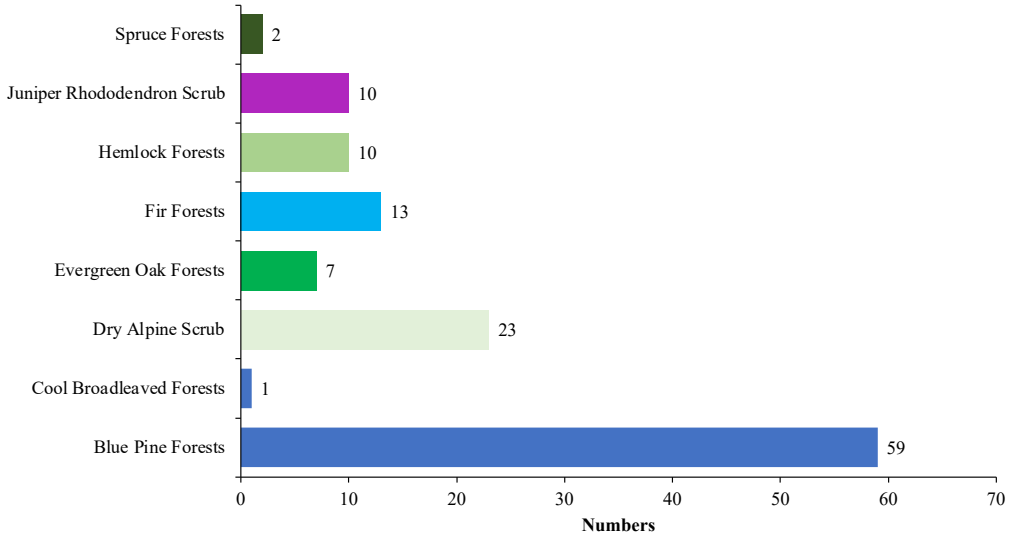

Figure 85: Water sources under different forest types in Tsento Gewog

In Tsento Gewog, of the 124 surveyed water sources, 73 sources were used for rural drinking, forming the maximum usage of the tapped water sources (Figure 86). Notably, 38 sources remain untapped. Other uses of water sources are given in the Figure below.

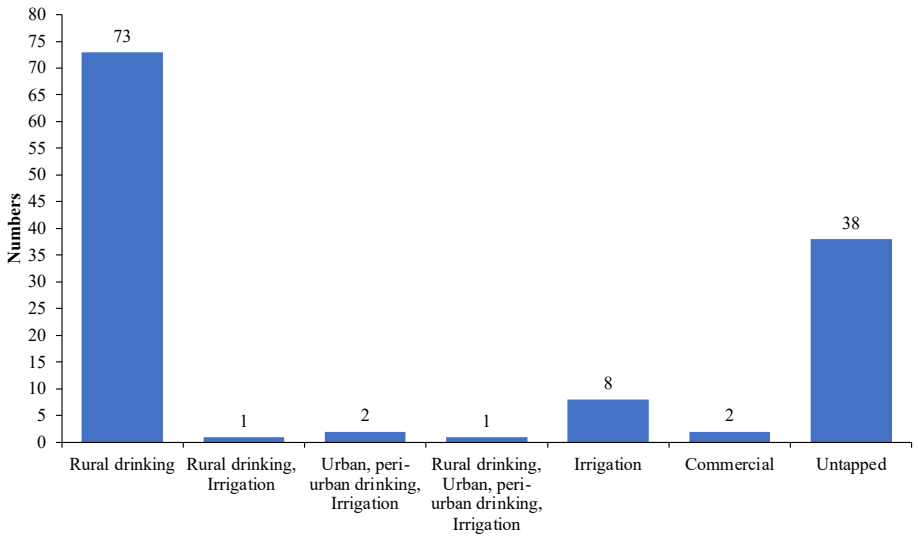

Figure 86: Uses of water sources in Tsento Gewog

Of the 124 water-source infrastructure recorded in Tsento Gewog, 54 lacked formal intake infrastructure, while another 54 had concrete-intake structures, the most widespread form of water capture infrastructure. A small number of sources utilized stone intakes (7), concrete intake and stone intake (2), drums (5), and wooden troughs (3) as the infrastructure (Figure 87).

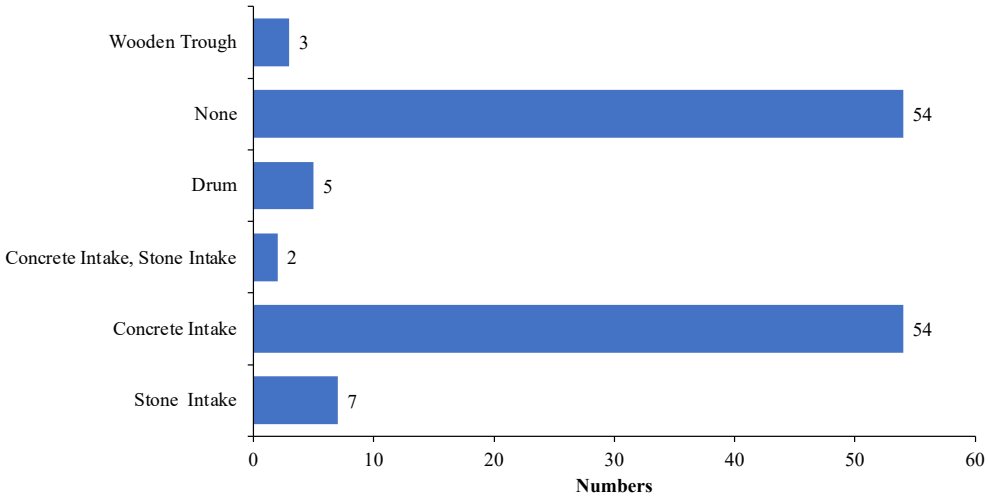

Figure 87: Types of infrastructures at water sources in Tsento Gewog

5.1.10. Wangchang Gewog

Wangchang Gewog recorded a total of 11 surface water sources. This includes eight water sources previously recorded in 2021 and an additional three water sources newly identified during this inventory. The type of source recorded was 100% (11) spring (Figure 88). Out of the 11 sources, 10 sources are perennial and one source is seasonal.

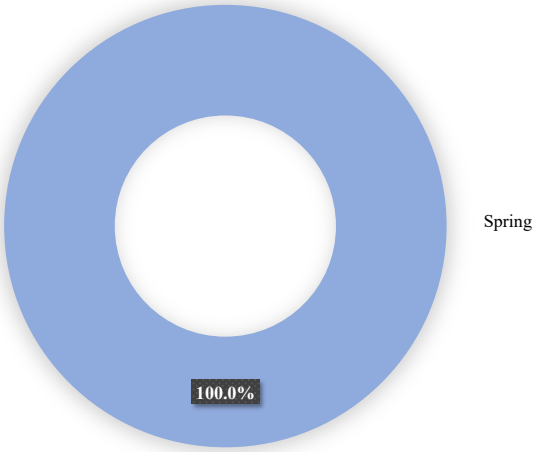

Figure 88: Types of water sources in Wangchang Gewog

Out of the 11 water sources recorded in Wangchang Gewog, 9.09% (1) of the sources have dried, 54.55% (6) sources are drying, 27.27% (3) sources have increased discharges while the status of discharges from the 9.09% (1) sources could not be determined. The location and status of these water sources are depicted in the map below (Figure 89).

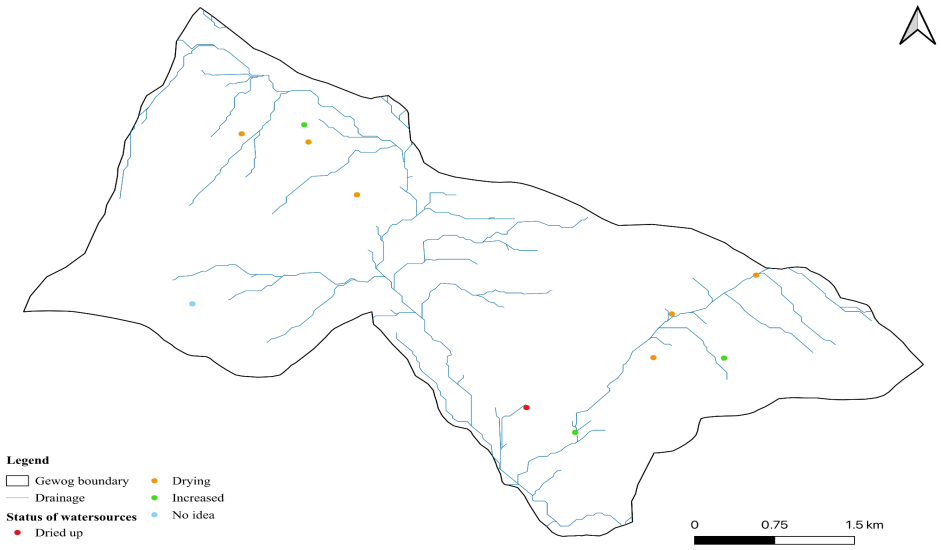

Figure 89: Map showing the status of water sources in Wangchang Gewog

A total of one dried up and six drying water sources were recorded at Wangchang Gewog. However, causes for all the drying water sources (7) at Wangchang Gewog could not be determined (Figure 90).

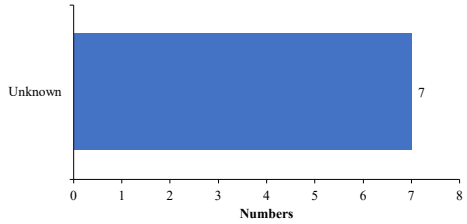

Figure 90: Causes of water sources depletion in Wangchang Gewog

Figure 91 shows that 54.54% (6) of the 11 water sources under Wangchang Gewog fall under the Normal risk category of watersheds. Only one water source falls under the Degraded category.

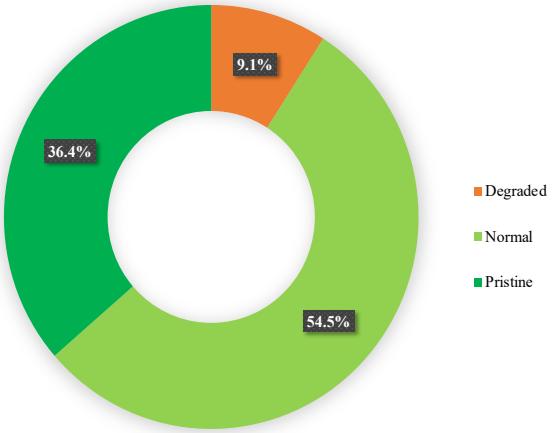

Figure 91: Watershed classification for water sources in Wangchang Gewog

All 11 water sources under Wangchang Gewog fall inside Blue Pine Forests as shown in Figure 92.

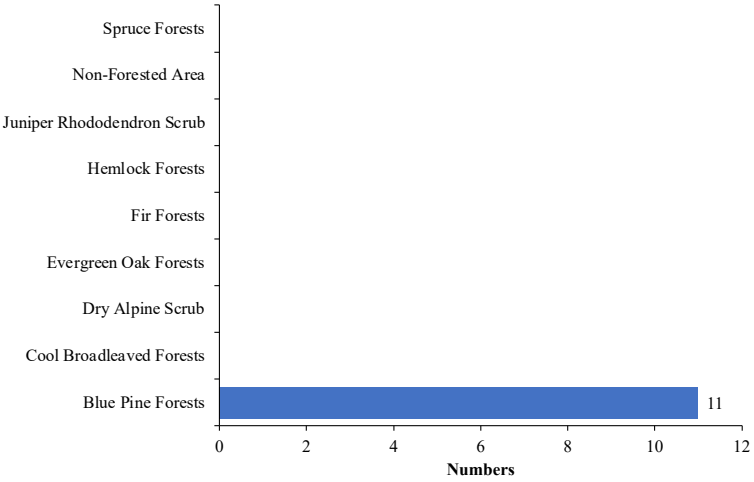

Figure 92: Water sources under different forest types in Wangchang Gewog

Figure 93 shows that of the 11 water sources inventoried in Wangchang Gewog, four are used exclusively for rural drinking followed by two sources used for commercial purposes. Additionally, four untapped sources were recorded.

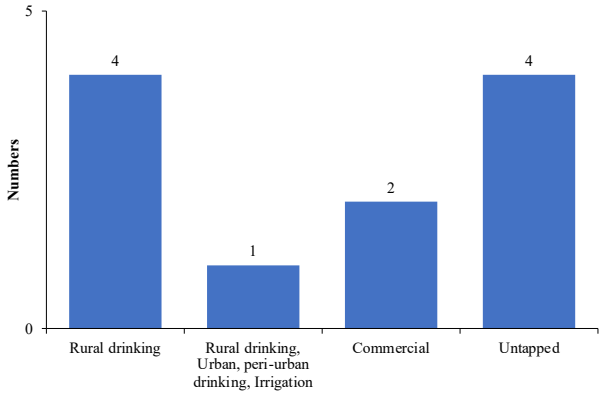

Figure 93: Uses of water sources in Wangchang Gewog

Figure 94 shows that of the 11 water sources recorded in Wangchang Gewog, five lacked any formal intake infrastructure, while three featured only concrete intake structures. Other infrastructure included wooden trough, drum and combination of concrete intake and zinc alum tank.

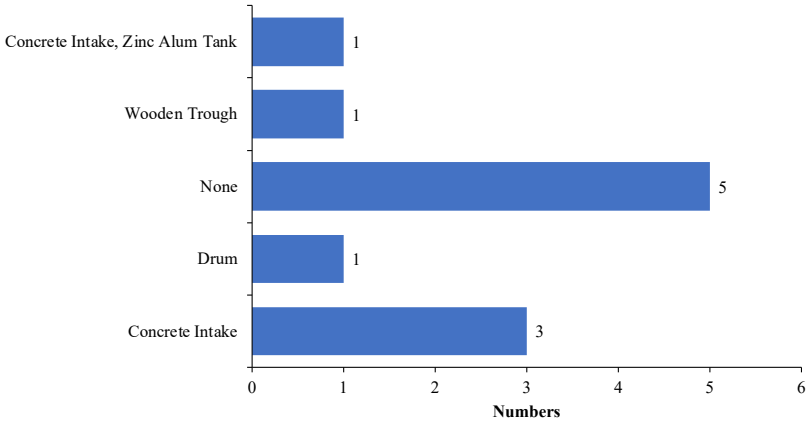

Figure 94: Types of infrastructures at water sources in Wangchang Gewog

5.2. Thimphu Dzongkhag

5.2.1. Chang Gewog

Chang Gewog recorded a total of 50 surface water sources. This includes 32 water sources previously recorded in 2021 and an additional 18 water sources newly identified during this inventory. Among the sources, two distinct types were identified (Figure 95). Streams accounted for the majority, making up 56% (28) of the total, followed by springs at 44% (22). All the 50 sources recorded in Chang Gewog were found to be perennial.

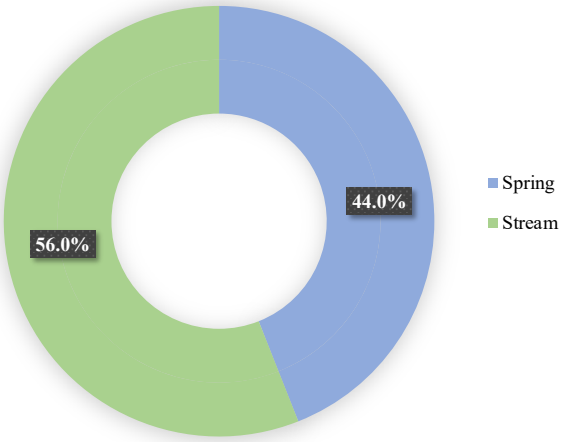

Figure 95: Types of water sources in Chang Gewog

Out of the 50 water sources recorded in Chang Gewog, 2% (1) source has dried up, 26% (13) sources are drying, 36% (18) sources show no change in the discharge, 2% (1) source has an increase in discharge while the status of the 34% (17) sources could not be determined. The location and status of these water sources are also presented in the map below (Figure 96).

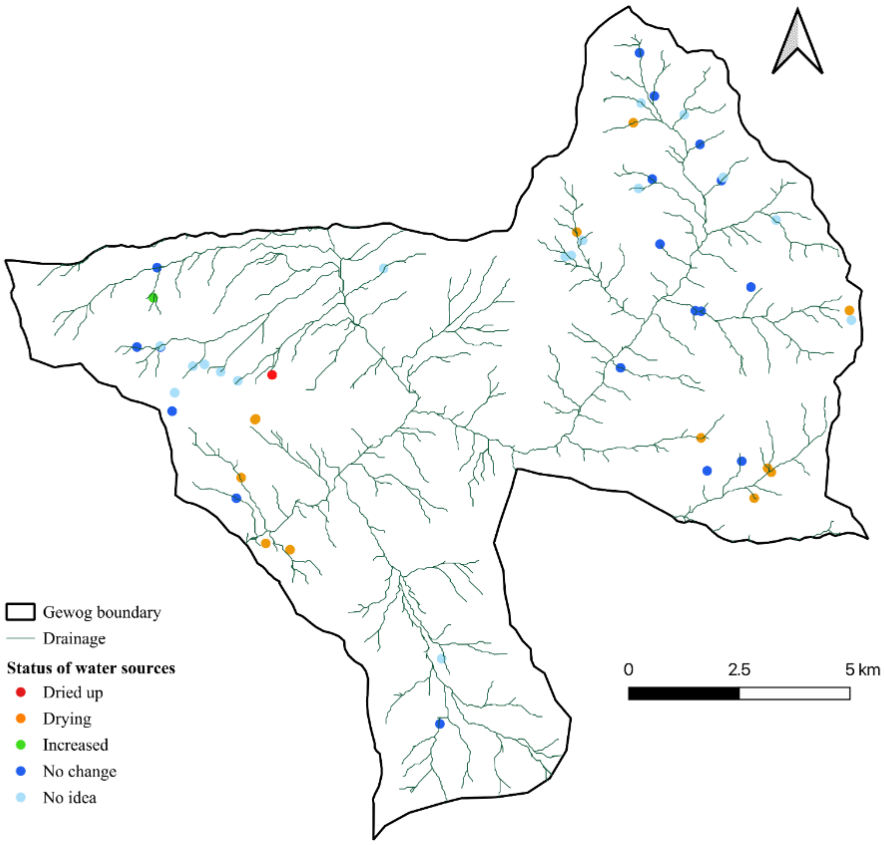

Figure 96: Map showing the status of water sources in Chang Gewog

A total of 13 drying and one dried up water source was recorded in Chang Gewog. Forest degradation and deforestation was identified as the key factor affecting the declining water sources at Chang gewog (8) followed by climate change (1) and combined impact of climate change and forest degradation and deforestation (1) (Figure 97). However, causes could not be determined for four of the drying water sources.

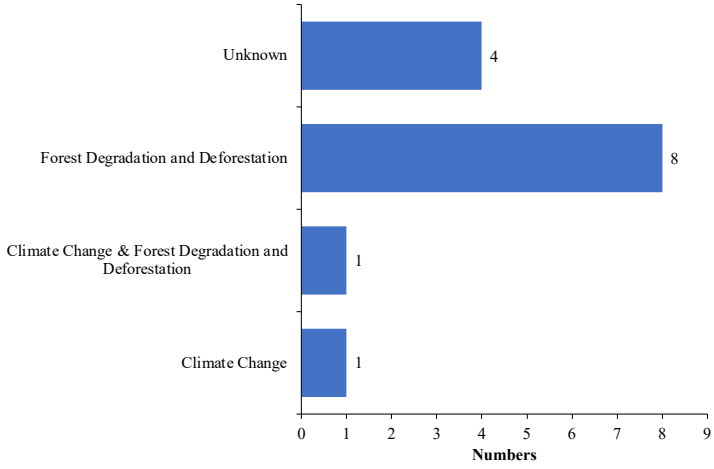

Figure 97: Causes of water sources depletion in Chang Gewog

Of the 50 water sources under Chang Gewog, 38% (19) sources fall under the Degraded risk category micro-watershed as presented in Figure 98. 32% of the micro-watersheds corresponding to 16 water sources are categorized under the Pristine category.

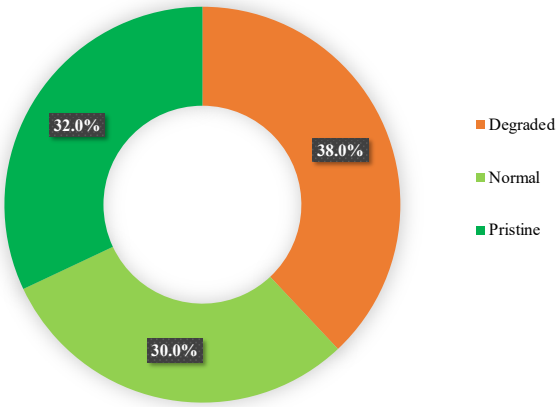

Figure 98: Watershed classification for water sources in Chang Gewog

Of the 50 water sources recorded under Chang Gewog, 17 water sources fall inside Blue Pine Forests followed closely by Fir Forests (16). Only one water source fall inside the Non-Forested Area. There is no water sources reported from inside Spruce Forests, Dry Alpine Scrub and Cool Broadleaved Forests (Figure 99).

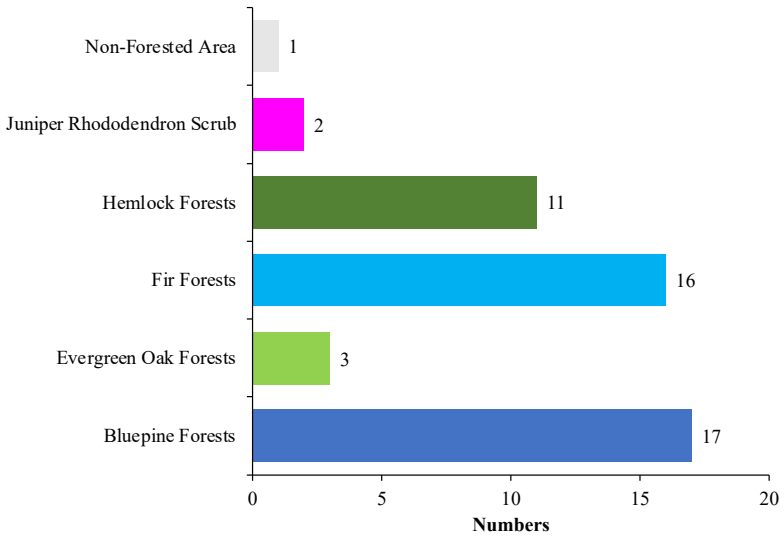

Figure 99: Water sources under different forest types in Chang Gewog

Figure 100 shows the various uses of water sources in Chang Gewog. Of the 50 water sources, 20 sources were used for rural drinking, 10 for urban/peri-urban drinking, and 15 sources remain as untapped sources. Only one source integrates irrigation with urban drinking, and there are 2–3 instances of commercial use (including multi-use).

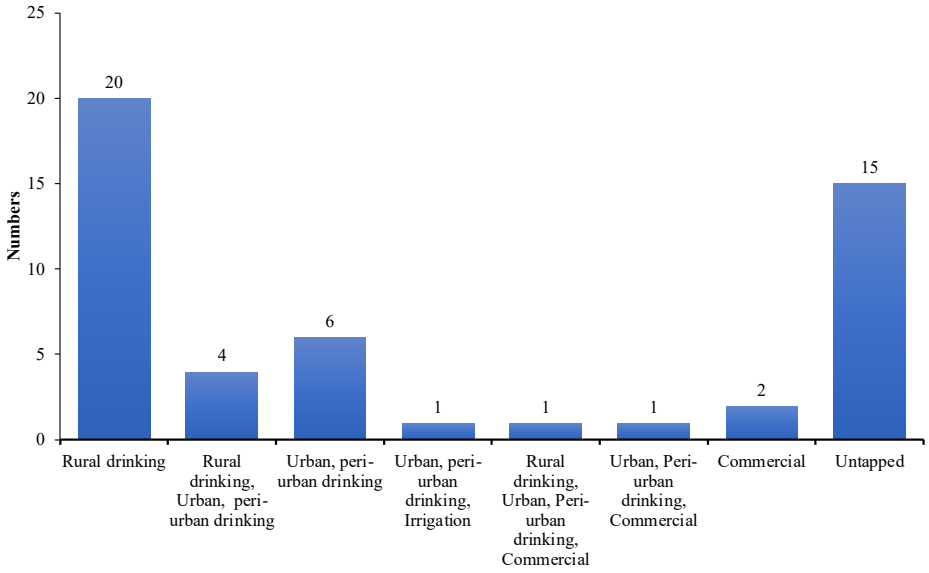

Figure 100: Uses of water sources in Chang Gewog

Among 50 recorded water sources in Chang Gewog, 22 lacked any infrastructure, while 7 had only concrete intake structures (Figure 101). An additional 7 adopted sedimentation tanks, and 4 integrated both intake and sedimentation functions. Only a few sources have storage drums (5) or fencing (2).

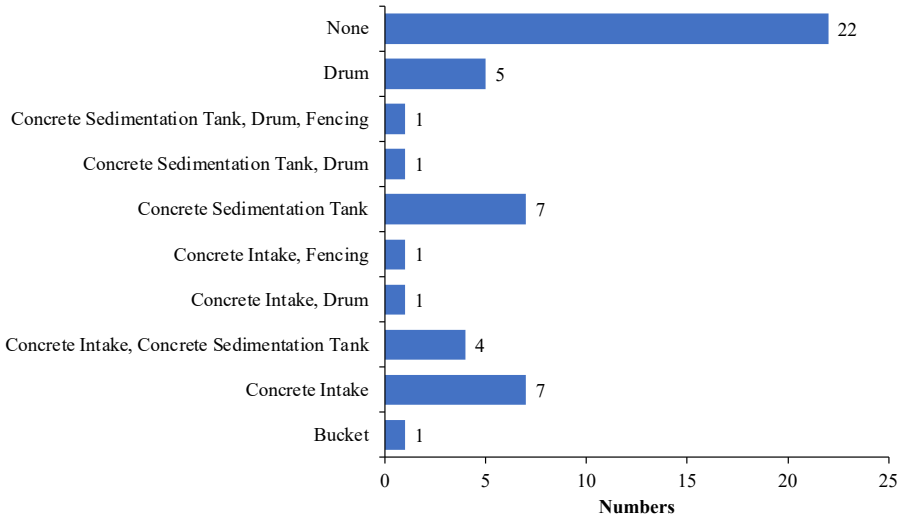

Figure 101: Types of infrastructures at water sources in Chang Gewog

5.2.2. Dagala Gewog

Dagala Gewog recorded a total of 31 surface water sources. This includes 19 water sources previously recorded in 2021 and an additional 12 water sources newly identified during this inventory. Among the sources, four distinct types were identified (Figure 102). Springs accounted for the majority, making up 58.06% (18) of the total, followed by streams, marshes and swamps at 19.35% (6), while rivers constituted only 3.23 (1) of the total recorded sources. All the 31 sources recorded were perennial.

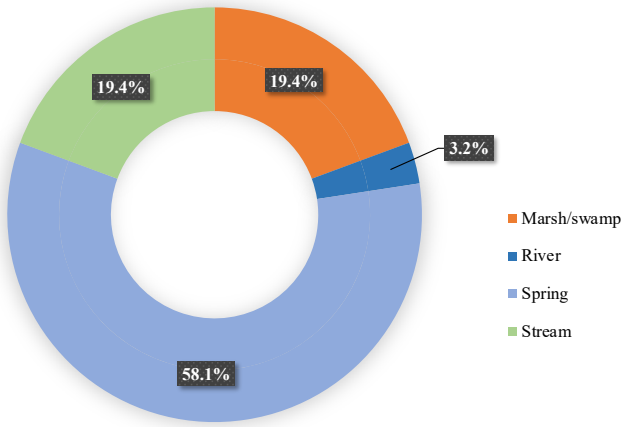

Figure 102: Types of water sources in Dagala Gewog

Out of the 31 water sources recorded in Dagala Gewog, 12.90% (4) sources are drying, 65% (20) show no change in discharge, while the status of 22.58% (7) sources could not be

ascertained. The location and status of these sources are also depicted in the map below (Figure 103).

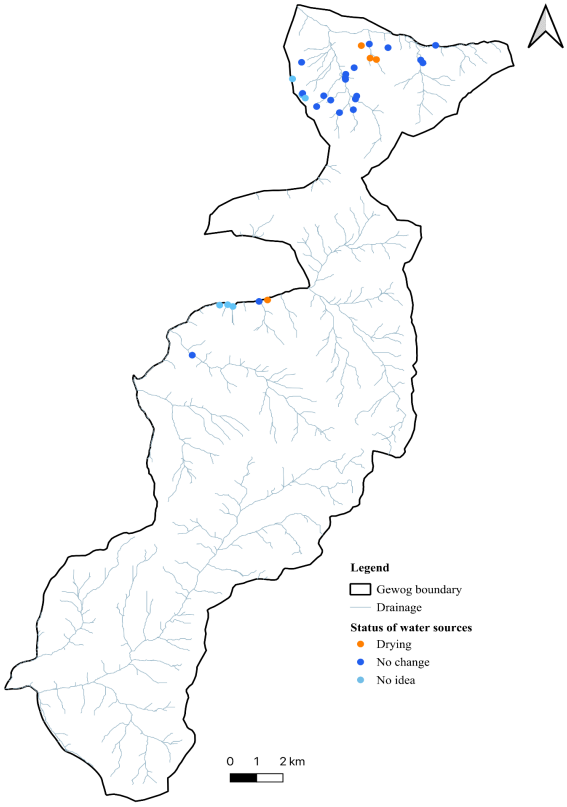

Figure 103: Map showing the status of water sources in Dagala Gewog

A total of four drying water sources were recorded from Dagala Gewog. Two of the drying water sources at Dagala Gewog were reported as a result of climate change followed by forest degradation and deforestation activities and combination of both (one each respectively) (Figure 104).

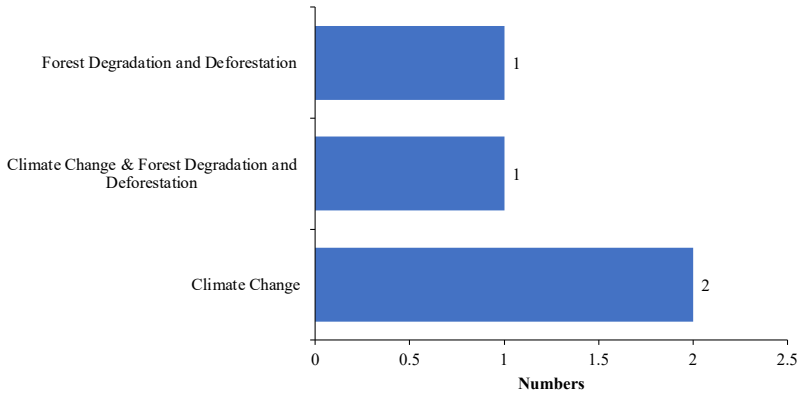

Figure 104: Causes of water sources depletion in Dagala Gewog

Out of the 31 water sources under Dagala Gewog, the micro-watersheds of 15 water sources corresponding to 48.39% fall under the Degraded risk category (Figure 105). 19.35% (6) micro-watersheds are reported as Pristine.

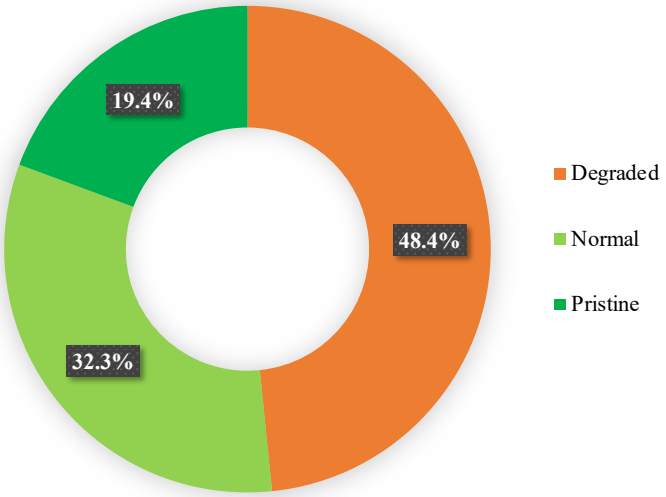

Figure 105: Watershed classification for water sources in Dagala Gewog

A total of 31 water sources was inventoried under Dagala Gewog of which the majority (14) of the water resources were recorded from inside Hemlock Forests (Figure 106). This was followed by Spruce Forests with six water sources and Blue Pine Forests with five water sources.

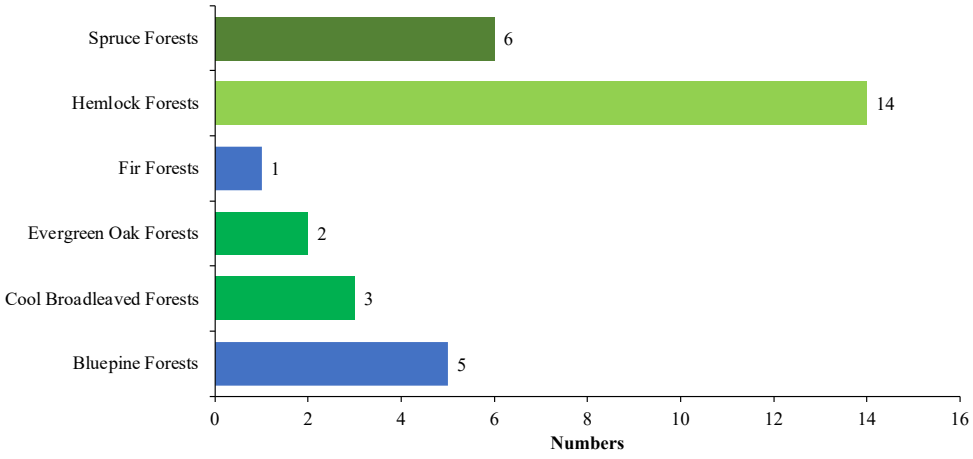

Figure 106: Water sources under different forest types in Dagala Gewog

Figure 107 shows the various uses of water sources in Dagala Gewog. Of the 31 water sources in Dagala Gewog, nine sources were used for rural drinking, four were used for both rural and urban/peri-urban drinking, and 10 were used for urban or peri-urban drinking needs. Just one source was used for commercial purposes, while seven sources remain untapped.

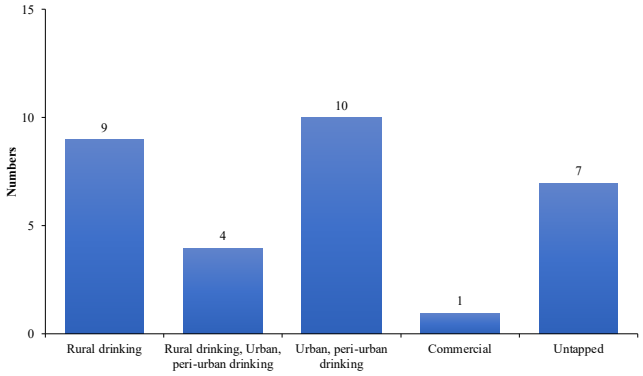

Figure 107: Uses of water sources in Dagala Gewog

As shown in the Figure 108, the water source infrastructure in Dagala Gewog reveals that Concrete Intake structures are the most commonly used, accounting for 14 sources. This indicates a strong emphasis on durable and secure water collection systems. However, 9 water sources lack any form of infrastructure, highlighting a need for further development and protection of these sources. Other infrastructure types such as Drums (3) and single instances of Wooden Trough, Stone Intake, Concrete Sedimentation Tank, and Drum with Fencing were recorded, but their presence is minimal.

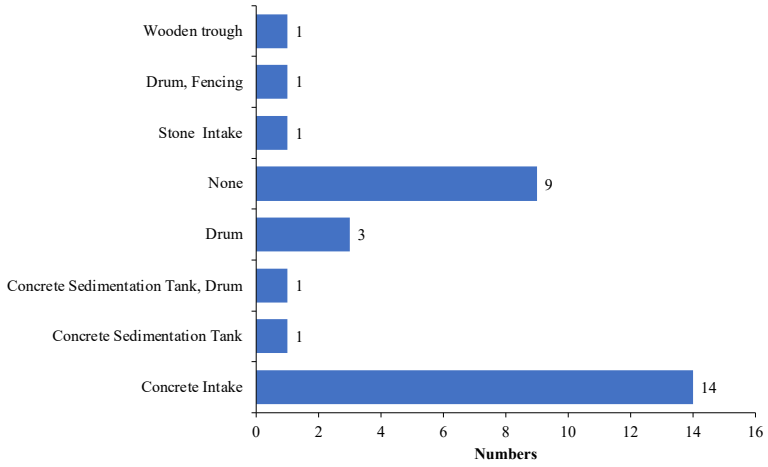

Figure 108: Types of infrastructures at water sources in Dagala Gewog

5.2.3. Genekha Gewog

Genekha Gewog recorded a total of 48 surface water sources. This includes 10 water sources previously recorded in 2021 and an additional 38 water sources newly identified during this inventory. Among the sources, five distinct types were identified (Figure 109). Springs accounted for the majority, making up 77.08% (37) of the total, followed by streams at 12.50% (6), marshes and swamps at 6.25% (3), while rivers and ponds constituted only 2.08% (1) of the total recorded sources. All the sources were recorded as perennial.

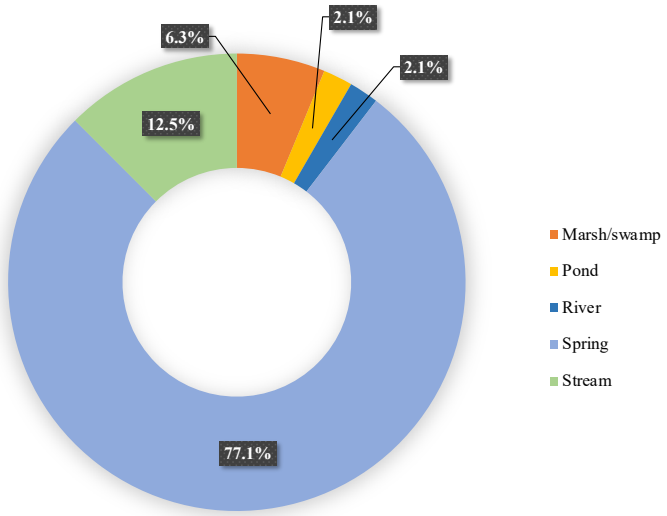

Figure 109: Types of water sources in Genekha Gewog

Out of the 48 water sources recorded in Genekha Gewog, 20.83% (10) sources are drying, 56.25% (27) sources showed no change in the discharge, 2.08% (1) source has increased discharge while the status of 20.83% (10) sources could not be determined. The location and status of these water sources are also depicted in the map below (Figure 110).

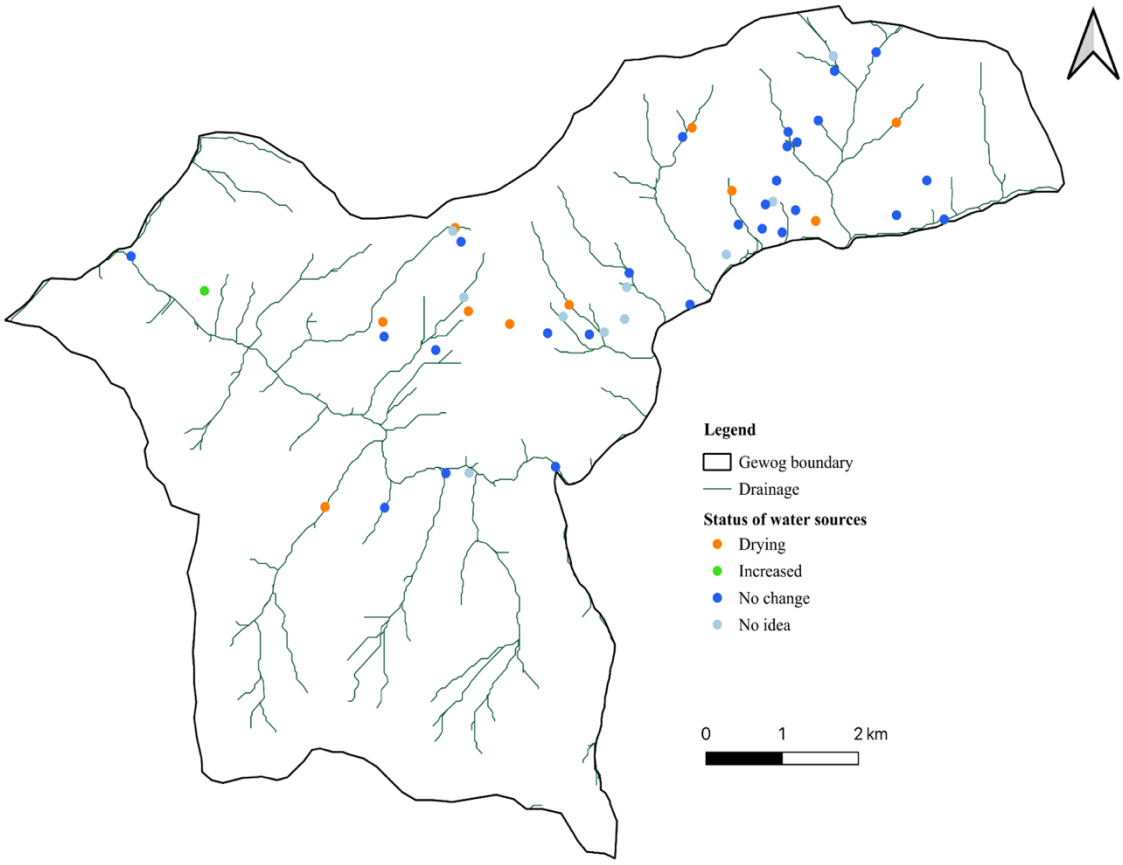

Figure 110: Map showing the status of water sources in Genekha Gewog

A total of 10 drying water sources were recorded at Genekha Gewog. Climate change was identified as one of the driving causes of drying water sources (9) followed by forest degradation and deforestation activities (1) (Figure 111).

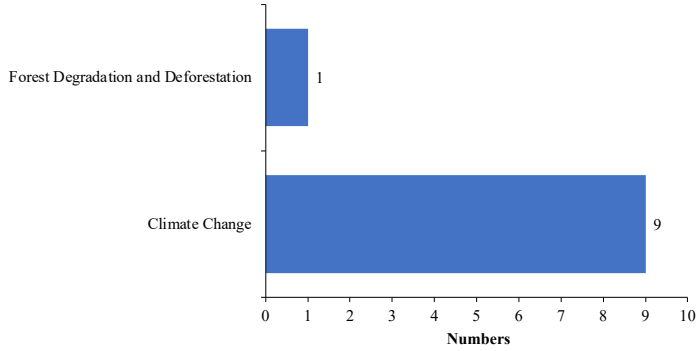

Figure 111: Causes of water sources depletion in Genekha Gewog

60.42% (29) of the micro-watersheds around the water sources inventoried under Genekha Gewog fall under the Degraded risk category (Figure 112). The Normal and Pristine category together makes up the other 39.58%.

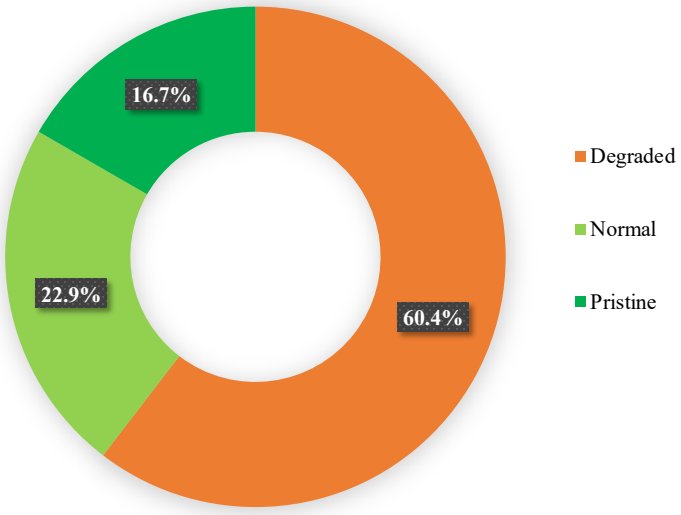

Figure 112: Watershed classification for water sources in Genekha Gewog

Of the 48 water sources inventoried under Genekha Gewog, 21 sources were found inside the Evergreen Oak Forests (Figure 113) The second highest number of 14 sources was inventoried inside Blue Pine Forests.

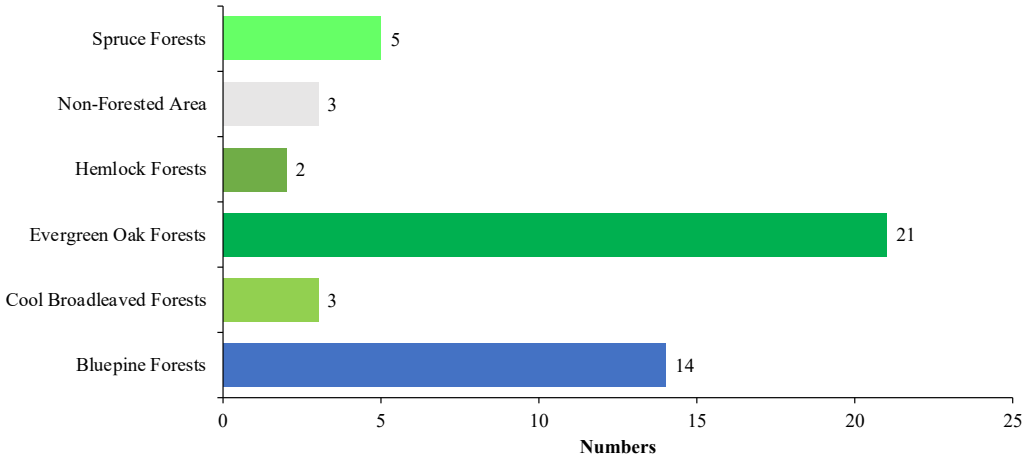

Figure 113: Water sources under different forest types in Genekha Gewog

As shown in the Figure 114, the Genekha Gewog have the majority of sources (16) used exclusively for rural drinking purposes, showing a strong reliance on these sources for household consumption in rural areas. Additionally, seven sources serve a dual purpose for rural drinking and irrigation, while nine sources are used solely for irrigation. A total of two sources each are used for multiple purposes including rural, urban, and peri-urban drinking, and also combined with irrigation. Another two sources cater exclusively to urban and peri-urban drinking. Only one source is shared between rural, urban, and peri-urban drinking without irrigation use. Significantly, 11 sources remain untapped, indicating a considerable potential for future development or utilization to meet growing water demands.

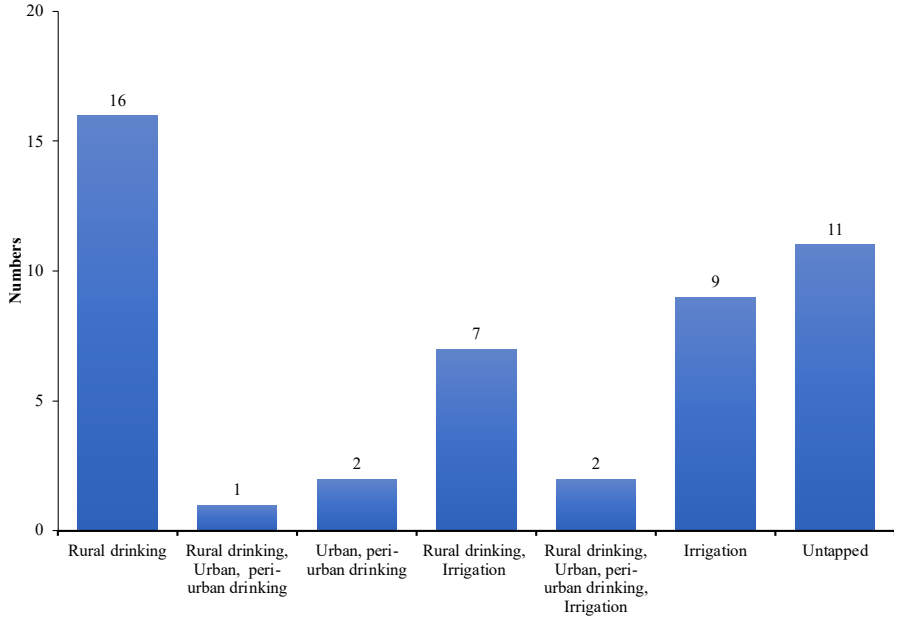

Figure 114: Uses of water sources in Genekha Gewog

The Figure 115 indicates that Concrete Intake structures are the most prevalent form of water source infrastructure in Genekha Gewog, found at 23 sources. This reflects a strong emphasis on constructing durable and permanent intake systems. However, 15 water sources have no infrastructure, highlighting a considerable gap in basic protection or development of water sources. Other infrastructure types include Drum (4), Concrete Intake with Drum (2), Concrete Intake with Stone Intake (1), Stone Intake alone (2), and Pond (1). These alternatives are present in relatively low numbers, indicating that while a variety of infrastructure types exist, they are not widely adopted.

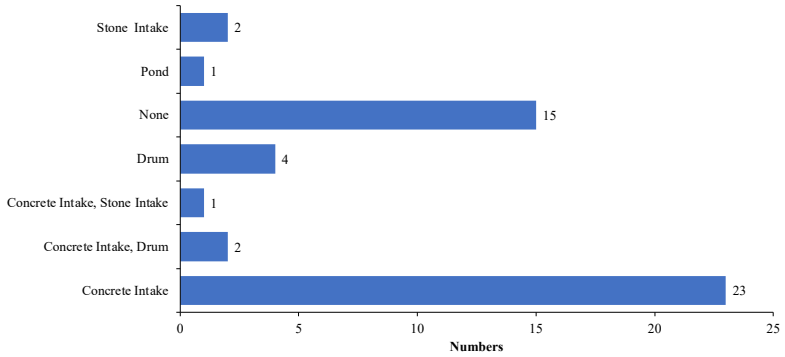

Figure 115: Types of infrastructures at water sources in Genekha Gewog

5.2.4 Kawang Gewog

Kawang Gewog recorded a total of 75 surface water sources. This includes 33 water sources previously recorded in 2021 and an additional 42 water sources newly identified during this inventory. Among the sources, four distinct types were identified (Figure 116). Streams accounted for the majority, making up 60% (45) of the total, followed by springs at 34.67% (26), while marshes and swamps, and rivers constituted 2.67% (2) each. All the sources were recorded as perennial.

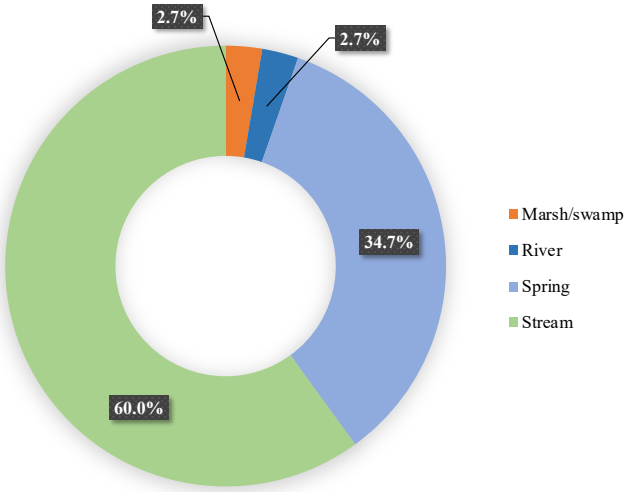

Figure 116: Types of water sources in Kawang Gewog

Out of the 75 water sources recorded in Kawang Gewog, 42.67% (32) are drying, 28% (21) show no change in the discharge, 1.33% (1) has increased discharge while the status of the 28% (21) sources could not be determined. The location and status of these water sources are also depicted in the map below (Figure 117).

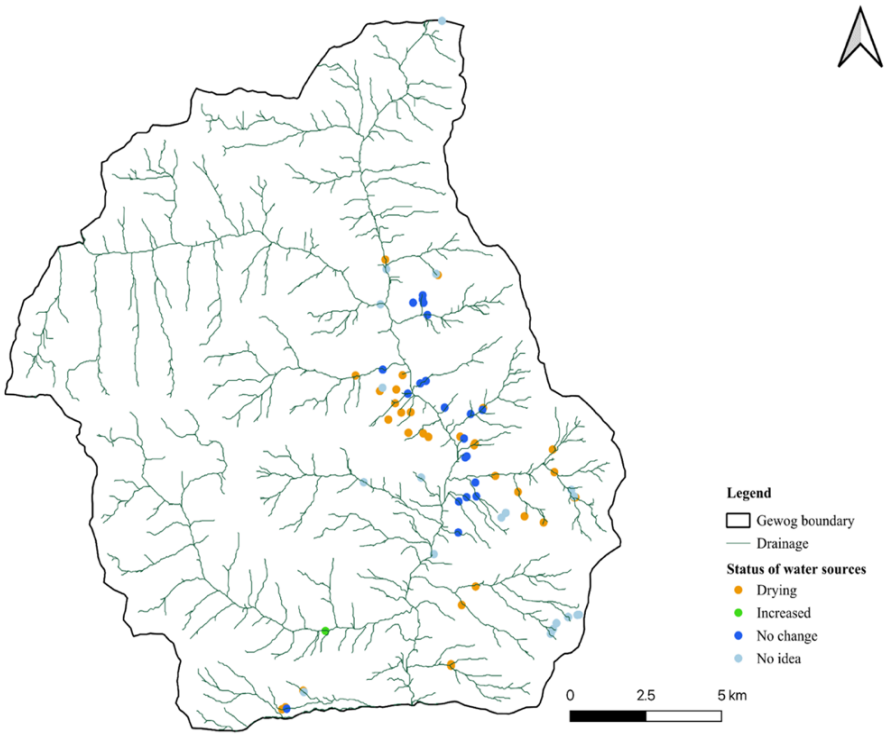

Figure 117: Map showing the status of water sources in Kawang Gewog

A total of 32 drying water sources were recorded in Kawang Gewog. Four primary factors affecting the drying water sources within Kawang Gewog were identified (Figure 118). Climate change was accorded as one of the leading causes of drying water sources for Kawang gewog (14). Other factors included forest degradation and deforestation activities (1) and combination of climate change and other anthropogenic activities (10). However, the causes remained unknown for seven of the drying water sources.

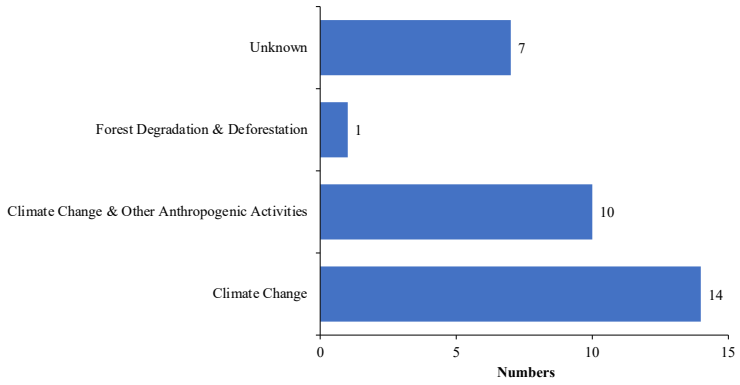

Figure 118: Causes of water sources depletion in Kawang Gewog

Of the 75 water sources under Kawang Gewog, the majority 37.33% (28) of the water sources fall under the 'Pristine' risk category for micro-watersheds. This is followed by 34.67% (26) sources under the 'Normal' risk category and 28% (21) under the 'Degraded' risk category as shown in Figure 119.

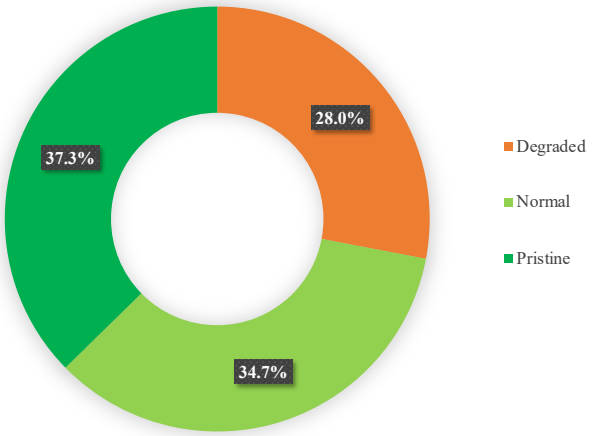

Figure 119: Watershed classification for water sources in Kawang Gewog

40 water sources out of the 75 inventoried under Kawang Gewog are located inside the Blue Pine Forest (Figure 120). The other major forest types with water sources are Fir Forests (11), Evergreen Oak Forests (7), Hemlock Forests (6), Spruce Forests (5), Cool Broadleaved Forests (4) and Non-Forested Area (2)

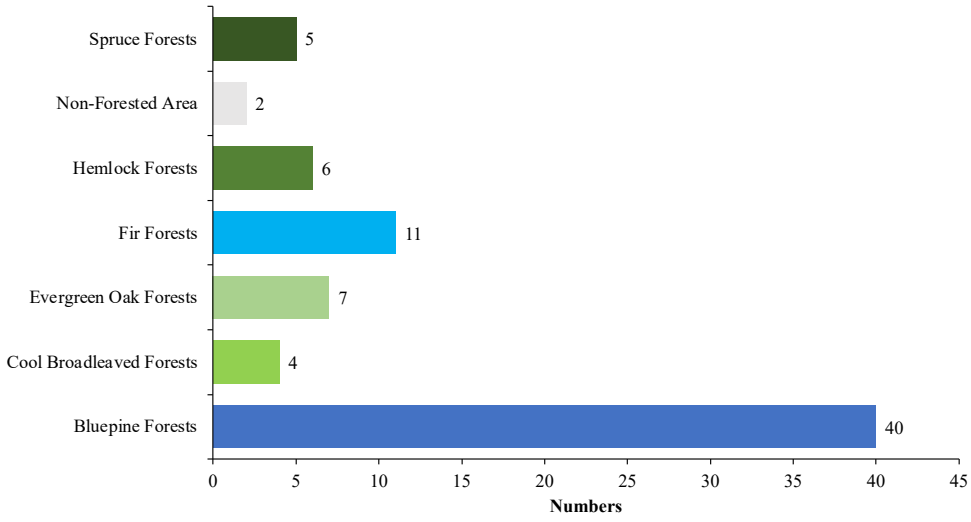

Figure 120: Water sources under different forest types in Kawang Gewog

As shown in the Figure 121, Kawang Gewog has the majority of water sources (31) used for urban and peri-urban drinking. This is followed by 15 sources used for rural drinking, and 12

sources that remain untapped. A total of seven sources supports urban, peri-urban drinking, and irrigation, while only one source is used for rural drinking and irrigation. Other uses include commercial purposes (5) and irrigation only (4).

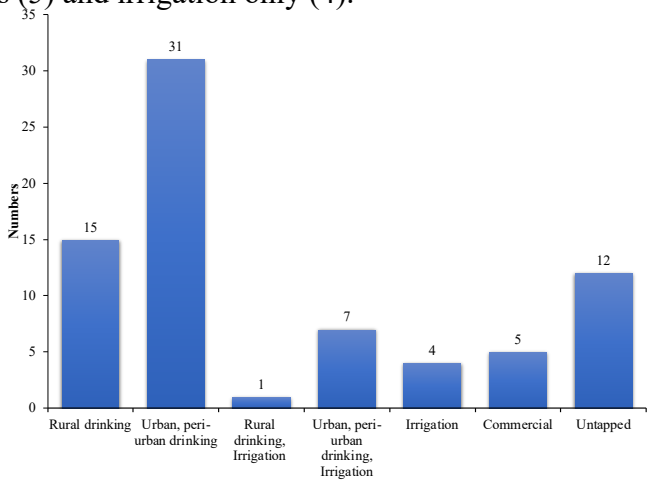

Figure 121: Uses of water sources in Kawang Gewog

The Figure 122 shows that Concrete Intake is the most widely used water source infrastructure at 35 sources in Kawang Gewog while 13 sources lack any form of infrastructure. Other commonly used infrastructure includes PVC Tanks (8), Concrete Sedimentation Tanks (6), and Wooden Troughs (4). Additionally, there are instances of combined systems, such as Concrete Intake with Sedimentation Tank and Fencing, though these are limited to 1–2 occurrences. Less frequent structures include Stone Intakes (2) and single occurrences of CGI Sheet roofing, Concrete Intake with Fencing, and Wooden Trough combined with Concrete Intake.

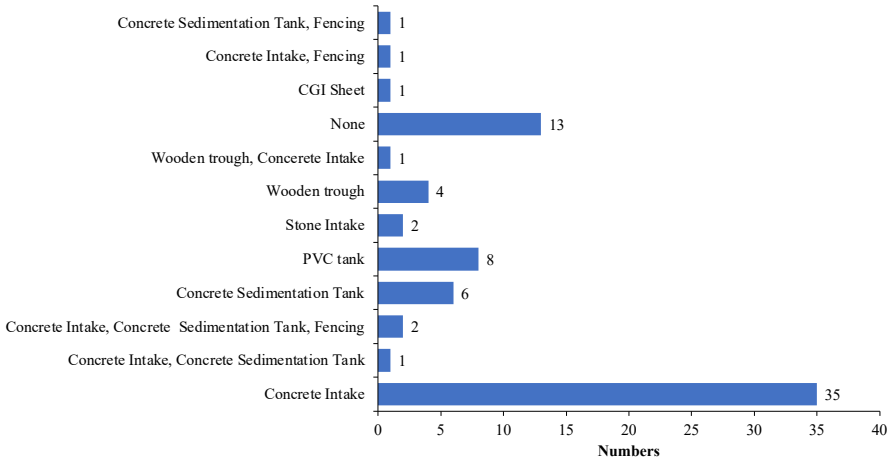

Figure 122: Types of infrastructures at water sources in Kawang Gewog

5.2.5. Lingzhi Gewog

Lingzhi Gewog recorded a total of 102 surface water sources. This includes 14 water sources previously recorded in 2021 and an additional 88 water sources newly identified during this inventory. Among the sources, five distinct types were identified (Figure 123). Streams accounted for the majority, making up 56.86% (58) of the total, followed by springs at 35.29% (36), marshes and swamps, and lakes constituted 2.94% (3) and rivers made up 1.96% (2) of the total. All the sources recorded were perennial.

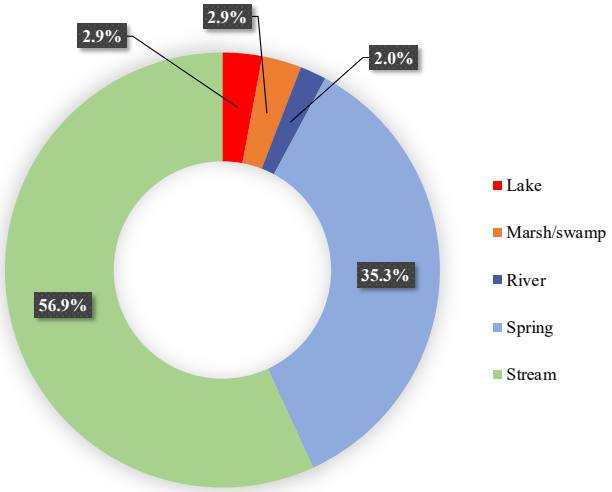

Figure 123: Types of water sources in Lingzhi Gewog

Out of the 102 water sources recorded in Lingzhi Gewog, 7.84% (8) sources are drying, 73.53% (75) sources show no change in the discharge, 1.96% (2) sources have increased discharge while the status of the 16.67% (17) sources could not be ascertained. The location and status of these water sources are also depicted in the map below (Figure 124)

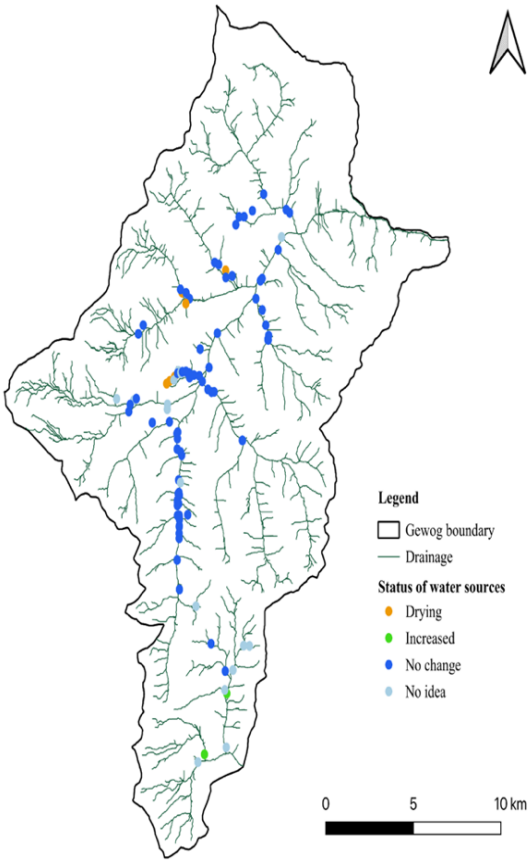

Figure 124: Map showing the status of water sources in Lingzhi Gewog

A total of eight drying water sources were recorded in Lingzhi Gewog. Climate change was identified as the leading cause of declining water sources at Lingzhi gewog (8) (Figure 125).

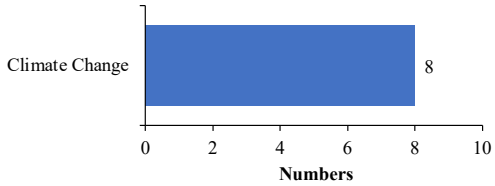

Figure 125: Causes of water sources depletion in Lingzhi Gewog

Of the 102 water sources under Lingzhi Gewog, 69.61% (71) micro-watersheds of the sources fall under the Pristine Overall risk rating category with another 26.47% (27) of the sources falling under the Normal category. Only 3.92% (4) of the water sources fall under the Degraded category (Figure 126).

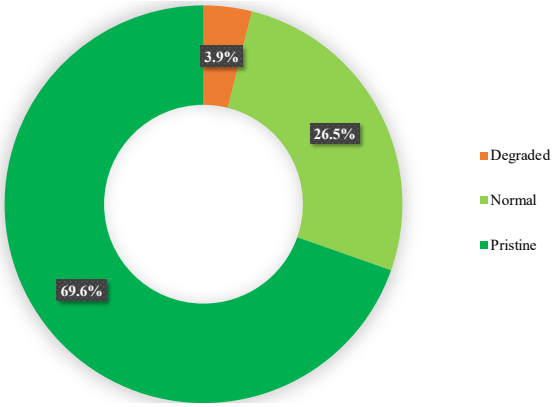

Figure 126: Watershed classification for water sources in Lingzhi Gewog

60 of the 102 water sources in Lingzhi Gewog are located inside Dry Alpine Scrub and 35 sources are inside Juniper Rhododendron Scrub as shown in Figure 127.

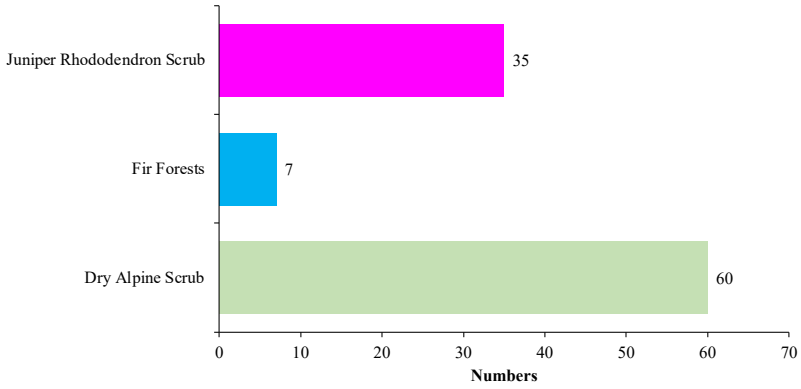

Figure 127: Water sources under different forest types in Lingzhi Gewog

The Figure 128 shows that 52 water sources in Lingzhi Gewog are used for rural drinking purposes, and nearly an equal number are currently untapped (50).

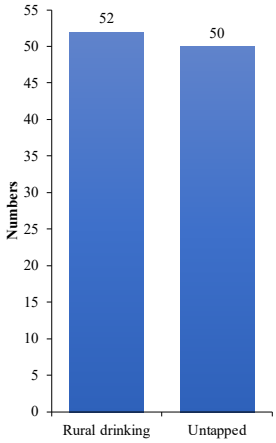

Figure 128: Uses of water sources in Lingzhi Gewog

The Figure 129 shows that the 55 water sources in Lingzhi Gewog have no infrastructure. The most common infrastructure is the Bucket type found at 19 sources, followed by Stone Intakes (14 sources) and Concrete Intake combined with Stone Intake (7 sources). Concrete Intake (4 sources) and Concrete Sedimentation Tanks (2 sources) are also present, while Drum-based infrastructure is minimal, recorded at just one source.

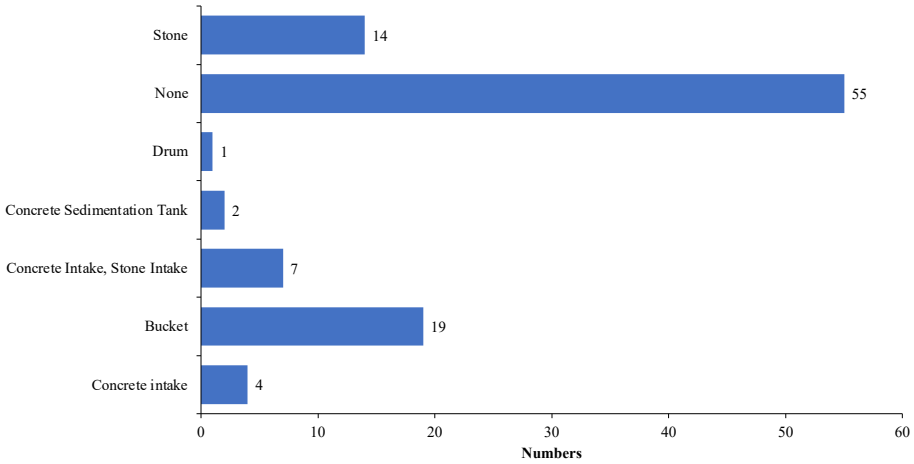

Figure 129: Types of infrastructures at water sources in Lingzhi Gewog

5.2.6. Mewang Gewog

Mewang Gewog recorded a total of 93 surface water sources. This includes 8 water sources previously recorded in 2021 and an additional 85 water sources newly identified during this inventory. Among the sources, five distinct types were identified (Figure 130). Streams accounted for the majority, making up 66.67% (62) of the total, followed by springs at 23.66% (22), marshes and swamps at 6.45% (6), lakes at 2.15% (2) while rivers constituted only 1.08% (1). Out of the 93 sources, 5 sources are seasonal, and 88 sources are perennial.

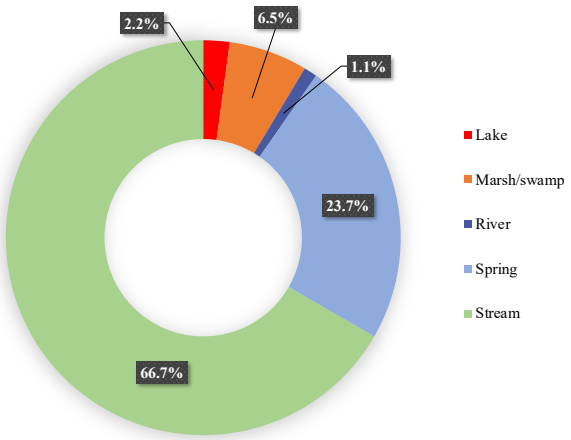

Figure 130: Types of water sources in Mewang Gewog

Out of the 93 water sources recorded in Mewang Gewog, 1.08% (1) has dried, 41.94% (39) are drying, 36.56% (34) sources show no change in discharge while the status of 20.43% (19) sources could not be determined. The location and status of these water sources are also depicted in the map below (Figure 131).

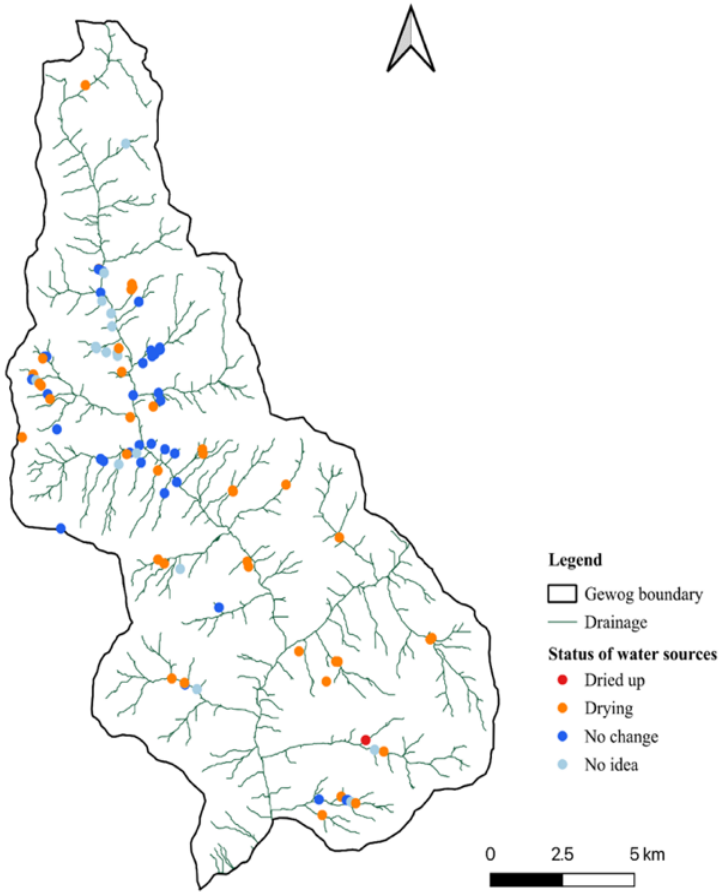

Figure 131: Map showing the status of water sources in Mewang Gewog

Mewang Gewog recorded a total of 39 drying and one dried up water source. Climate change was accounted as one of the main factors affecting drying water sources in Mewang Gewog (18) followed by a combination of climate change with other anthropogenic activities (12) and forest degradation/deforestation activities (9) (Figure 132). Forest degradation/deforestation activities were responsible for one of the drying water sources.

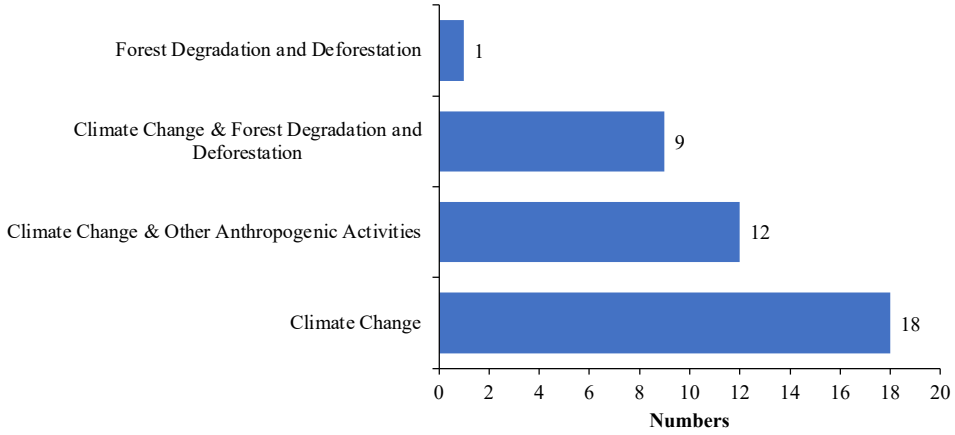

Figure 132: Causes of water sources depletion in Mewang Gewog

44.09% (41) of the water sources under Mewang Gewog are in the Pristine category of the overall risk rating of the respective watersheds (Figure 133) while 29.03% (27) are under Normal category. There are no water sources that fall under the Critical category, but 26.88% (25) number of water sources fall under the Degraded category.

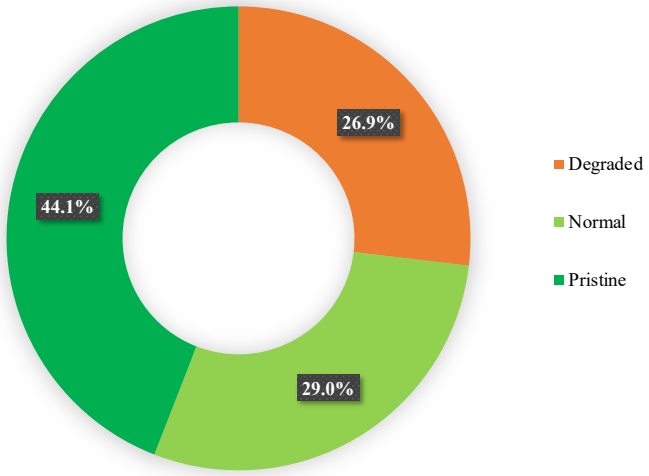

Figure 133: Watershed classification for water sources in Mewang Gewog

Of the 93 water sources under Mewang Gewog, 53 sources are located inside Blue Pine Forests (Figure 134). The second highest number of water sources is recorded inside Hemlock Forests with 14 water sources recorded.

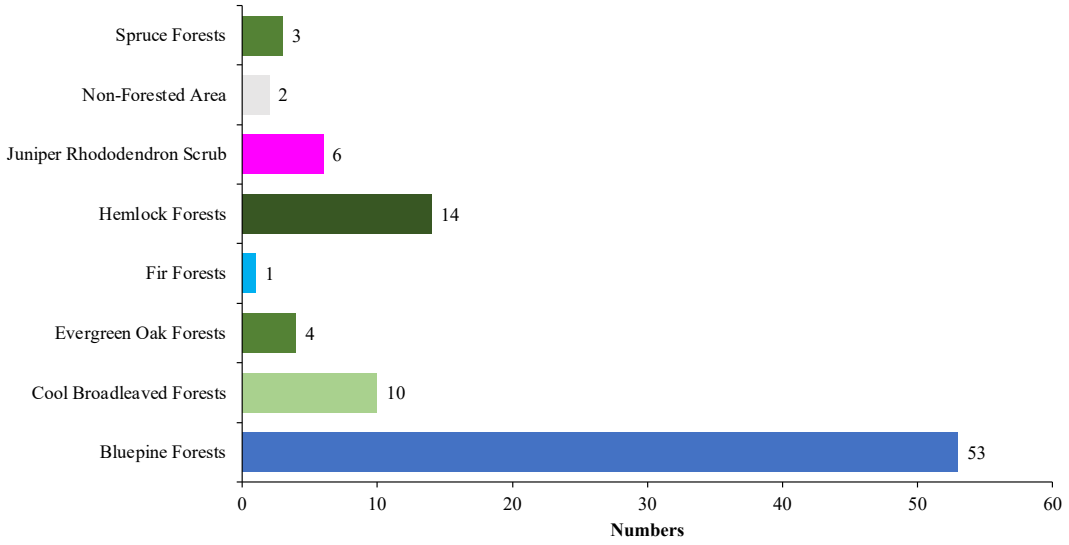

Figure 134: Water sources under different forest types in Mewang Gewog

The Figure 135 highlights that rural drinking is the predominant use of water sources in Mewang Gewog, accounting for 45 sources. Additionally, 21 sources remain untapped while irrigation is the next most common use, with 10 sources dedicated solely to it. Other sources used for multiple purposes are shown in the Figure below.

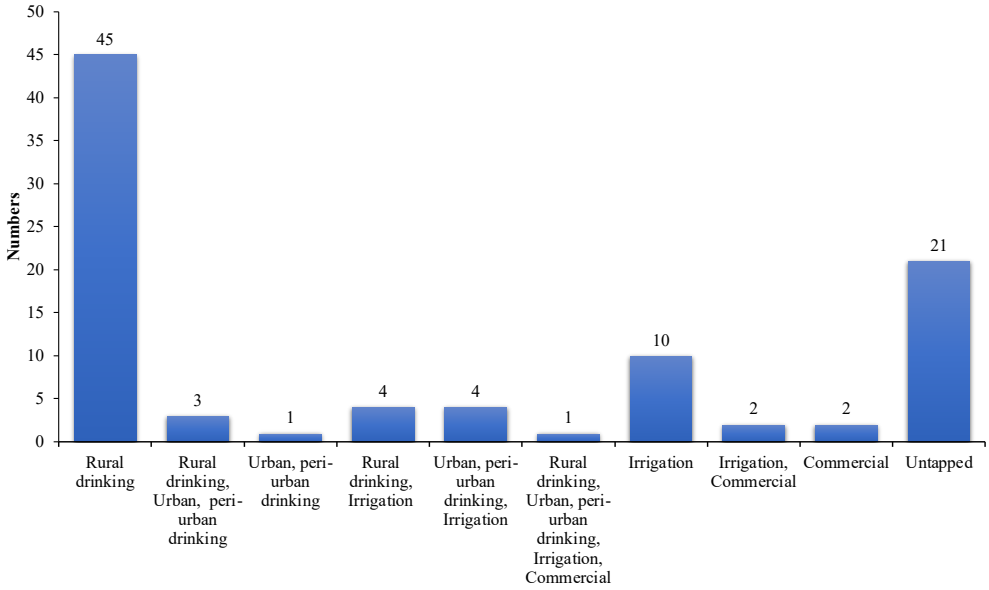

Figure 135: Uses of water sources in Mewang Gewog

The Figure 136 shows that 43 water sources in Mewang Gewog have no infrastructure, making up the largest share, while 36 sources are equipped with concrete intake structures. Other infrastructure types are minimal and its detail are shown in the Figure below.

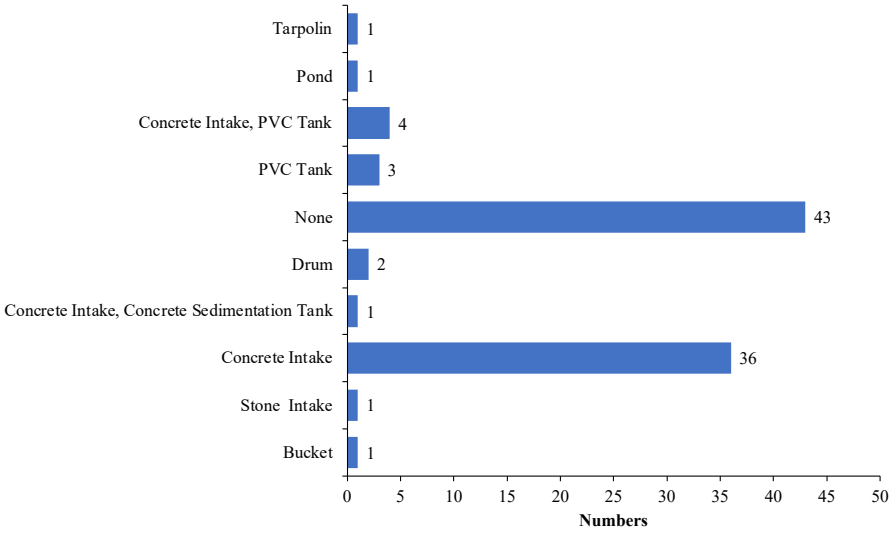

Figure 136: Types of infrastructures at water sources in Mewang Gewog

5.2.7. Naro Gewog

Naro Gewog recorded a total of 44 surface water sources. This includes four water sources previously recorded in 2021 and an additional 40 water sources newly identified sources during this inventory. Among the sources, two distinct types were identified (Figure 137). Streams accounted for the majority, making up 59.09% (26) of the total, followed by springs at 40.90% (18). All the sources recorded were perennial.

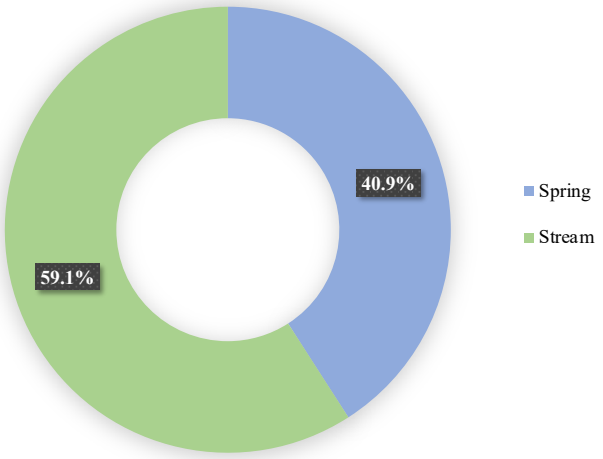

Figure 137: Types of water sources in Naro Gewog

Out of the 44 water sources recorded in Naro Gewog, 6.82% (3) are drying, 40.91% (18) sources show no change in the discharge while the status of 52.27% (23) could not be ascertained. The location and status of these water sources are also depicted in the map below (Figure 138).

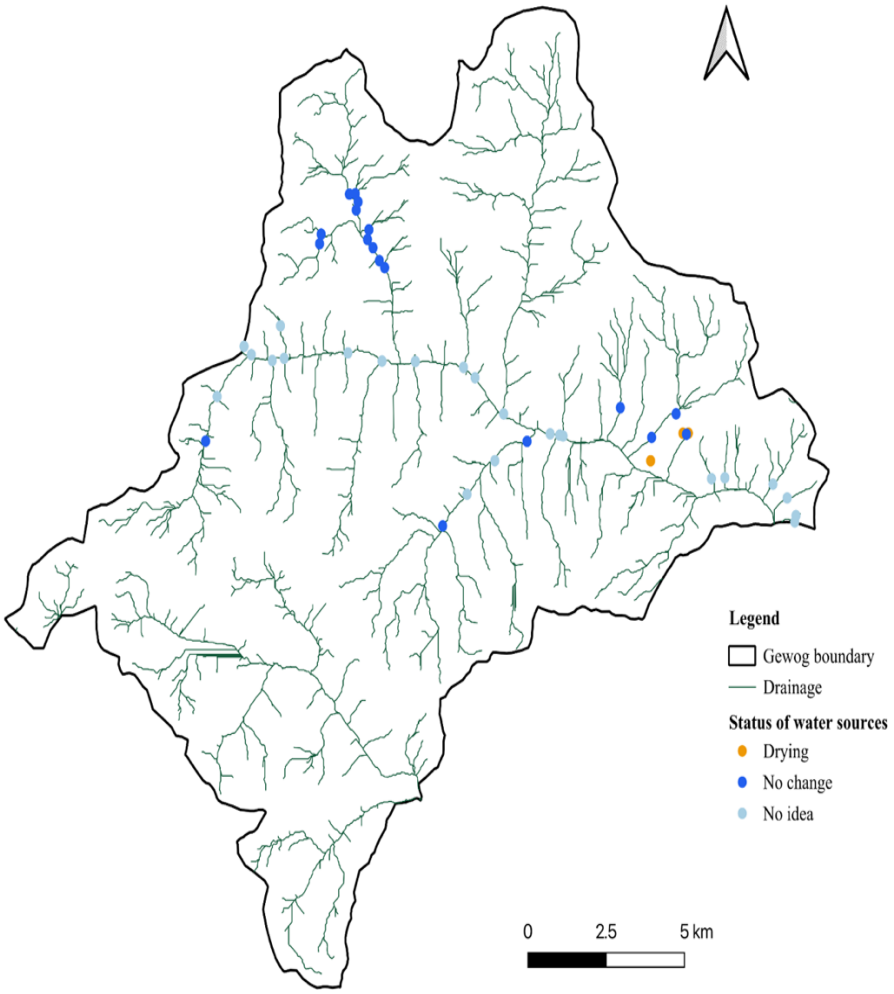

Figure 138: Map showing the status of water sources in Naro Gewog

Naro Gewog reported a total of three drying water sources. Two of the drying water sources were driven by climate change followed by one due to forest degradation/deforestation activities (Figure 139).

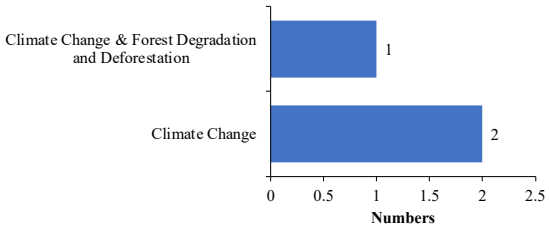

Figure 139: Causes of water sources depletion in Naro Gewog

As shown in the Figure 140, 63.64% (28) micro-watersheds of the water sources in Naro Gewog fall under the Pristine overall risk rating of watersheds while 34.09% (15) sources are in the Normal category. The Degraded category is only 2.27% (1).

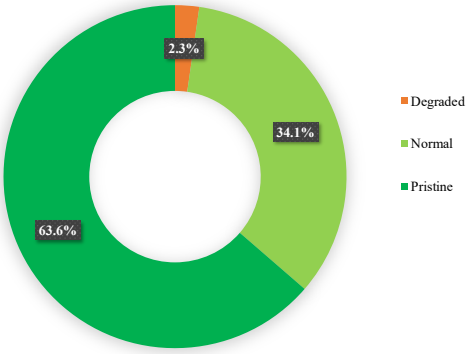

Figure 140: Watershed classification for water sources in Naro Gewog

As shown in the Figure 141, 20 water sources in Naro Gewog are located inside Fir Forests. The other forest types with water sources recorded are Dry Alpine Scrub (17), Juniper Rhododendron Scrub (6) and Hemlock Forests (1).

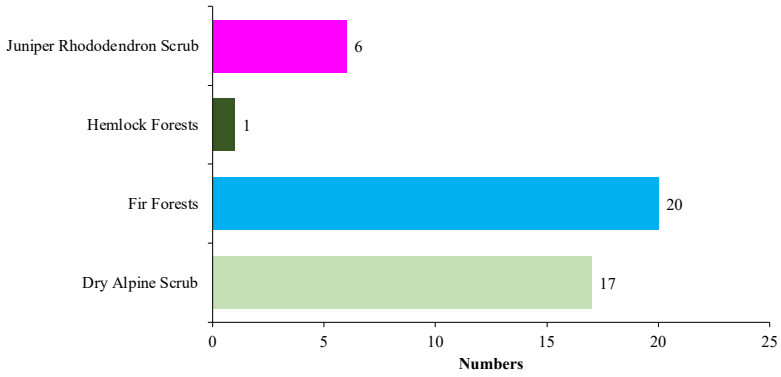

Figure 141: Water sources under different forest types in Naro Gewog

The Figure 142 shows that in Naro Gewog, 20 water sources are currently used for rural drinking purposes, while 24 water sources remain untapped.

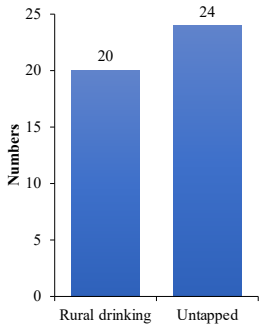

Figure 142: Uses of water sources in Naro Gewog

The Figure 143 shows that 40 water sources in Naro Gewog have no infrastructure. Only a few sources are equipped with other forms of infrastructure such as Fencing (2), Drum (1) and Concrete Intake (1).

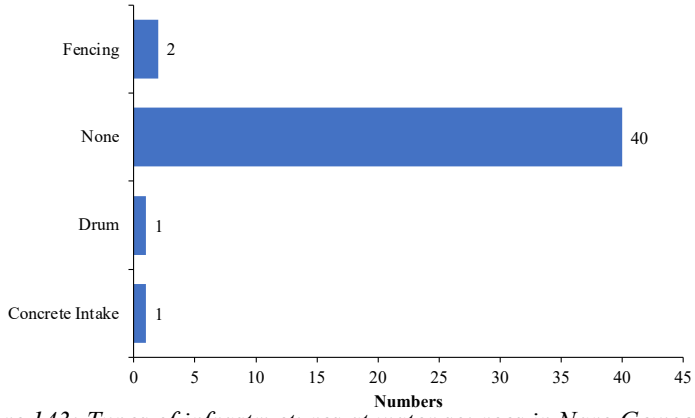

Figure 143: Types of infrastructures at water sources in Naro Gewog

5.2.8. Soe Gewog

Soe Gewog recorded a total of 52 surface water sources. This includes 12 water sources previously recorded in 2021 and an additional 40 water sources newly identified during this inventory. Among the sources, three distinct types were identified (Figure 144). Springs accounted for the majority, making up 63.46% (33) of the total, followed by streams at 23.08% (12), while lakes constituted only 13.46% (7). Out of the 52 sources, 3 sources are seasonal, and 49 sources are perennial.

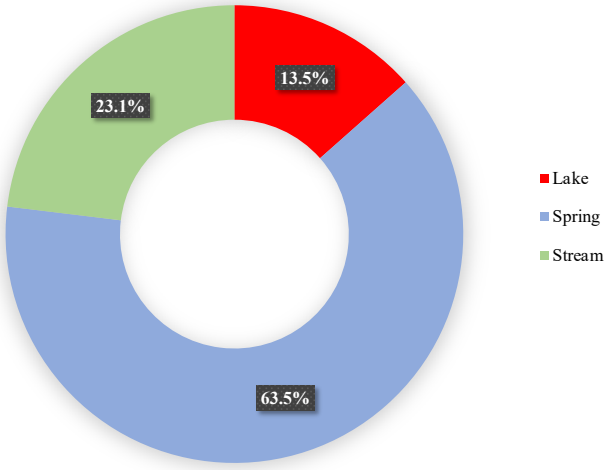

Figure 144: Types of water sources in Soe Gewog

Out of the 52 water sources recorded in Soe Gewog, 1.92% (1) source is drying while 98.08% (51) sources show no change in their discharges. The location and status of these water sources are also depicted in the map below (Figure 145).

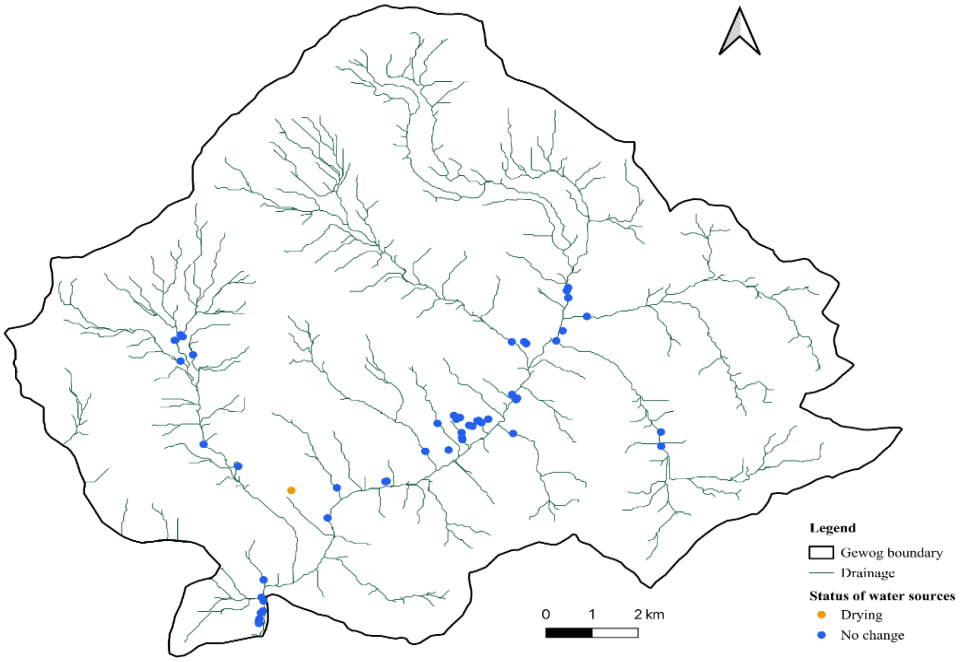

Figure 145: Map showing the status of water sources in Soe Gewog

Only one drying water source was recorded in Soe Gewog driven by climate change and earthquake (Figure 146).

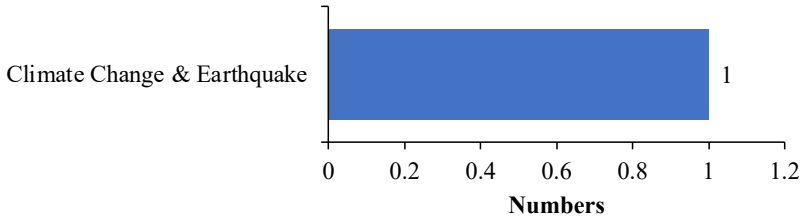

Figure 146: Causes of water sources depletion in Soe Gewog

Of the 52 water sources under Soe Gewog, 48 (92.31%) micro-watersheds of the sources fall under the Pristine risk category for watersheds with another 4 (7.69%) sources falling under the Normal category (Figure 147). There were no Degraded or Critical watersheds reported under the Gewog.

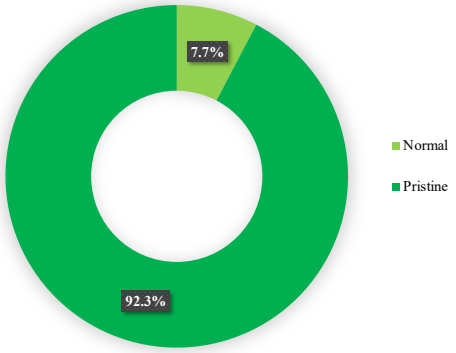

Figure 147: Watershed classification for water sources in Soe Gewog

The Figure 148 shows that 37 water sources in Soe Gewog are located inside Juniper Rhododendron Scrub. The other forest types with water sources inventoried are Dry Alpine Scrub (10) and Fir Forests (5).

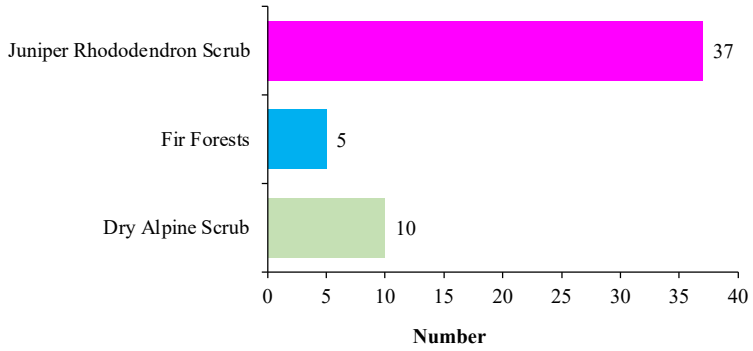

Figure 148: Water sources under different forest types in Soe Gewog

As shown in the Figure 149, Soe Gewog has 23 water sources currently being utilized for rural drinking purposes while 29 water sources are untapped.

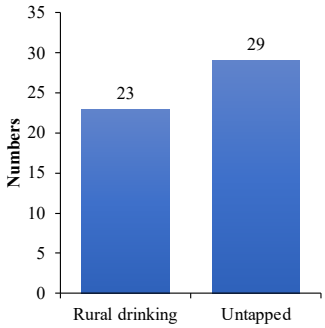

Figure 149: Uses of water sources in Soe Gewog

The Figure 150 shows that 26 of the water sources in Soe Gewog 36 have no infrastructure. A smaller portion of the sources are equipped with basic infrastructure. Concrete Intake and Stone Intake combination is found at six sources Concrete Intake alone is also present at six sources, and Stone Intake alone exists at four sources.

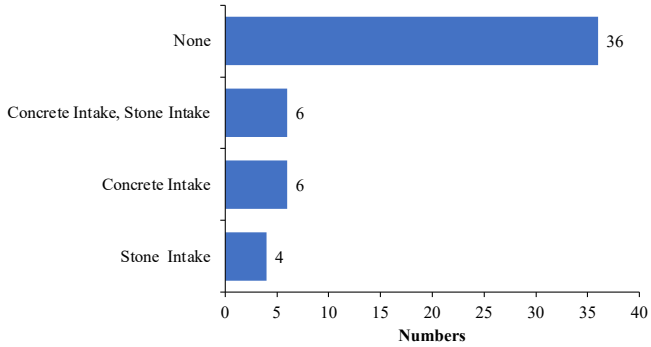

Figure 150: Types of infrastructures at water sources in Soe Gewog

6. LIMITATIONS

The implementation of the WRI encountered number of limitations that may have affected both the data collection and result analysis.

a) The WRI is planned to be completed by the end of the 13th Five Year Plan. Although simultaneous implementation across all 20 Dzongkhags would have ensured nationwide consistency and timely completion, the phased approach was necessary because of limited financial resources. While it is practical, this approach may lead to time-related variations that could affect comparisons among Dzongkhags.
b) Another key limitation was unavailability and inconsistency of equipment used during field data collection. Due to shortages of field equipment, uniform instrumentation could not be maintained across all Gewogs in Thimphu and Paro Dzongkhags. This variation in tools and methods used may have introduced minor discrepancies in data accuracy, thereby affecting the uniformity and comparability of the results across different water sources.
c) Additionally, potential discrepancies may exist in the household and population data collected during the WRI. These figures were obtained through consultations with field guides and local communities, relying on local knowledge and observations rather than official demographic records. Consequently, some deviations from officially documented statistics are expected, which may influence the accuracy of population-based water dependency assessments.
d) Discharge data were collected only during the spring (lean) season, which limits temporal scope of the water discharge analysis. Without measurements from multiple seasons, it is difficult to capture seasonal variability in water availability, which is essential for identifying long-term trends and supporting sustainable water resources management.
e) Further, some discharge records from 2021 showed significant differences compared to current discharge records and could not be reliably used for comparing the status of the water sources, while some of the previously recorded sources could not be located for verification due to errors in geo-coordinates.
f) It was not possible to record all the water sources as the WRI was done within a span of one month considering the manpower shortage and financial constraints.

7. RECOMMENDATIONS

The WRI conducted in Paro and Thimphu Dzongkhags revealed that a significant proportion of water sources are either in the process of drying or have already dried up. This trend is primarily attributed to the impacts of climate change and other anthropogenic factors such as land-use changes and increased developmental activities. If not addressed in a timely and coordinated

manner, the continued degradation of water sources could adversely affect the livelihoods of local communities, national economic growth, and environmental sustainability. In view of the above, the following recommendations are proposed:

i. Invest in Conservation and Protection of Water Sources

Immediate and sustained investments should be made to conserve and protect water sources in Paro and Thimphu Dzongkhags. These efforts are crucial to mitigate the impacts of climate change and human-induced pressured such as land-use changes and developmental activities.

ii. Conduct Scientific Assessments of Drying Water Sources

Comprehensive research and scientific assessments should be carried out to determine the root causes of drying water sources. These assessments must aim to provide evidence-based, site-specific recommendations for targeted mitigation and intervention measures.

iii. Study the Potential of Untapped Water Sources

Untapped water sources identified during the WRI should be further studied to assess their potential for sustainable use, particularly in areas facing current or anticipated water scarcity.

iv. Verify and Assess Degraded Watersheds

Field verification and detailed assessments of degraded watersheds should be conducted prior to initiating any restoration or developmental activities. This will help to validate their current status and inform appropriate management strategies.

v. Ensure Consultation and Coordination with DoW

Where water abstraction from degraded watersheds is deemed necessary, implementing agencies must consult with the DoW to carry out detailed watershed assessments. All interventions should align with national watershed management guidelines.

vi. Upgrade Water Source Infrastructure

Existing basic infrastructure such as drums, buckets, and wooden troughs could be replaced with durable and reliable systems. Priority should be given to constructing reinforced concrete intakes and protective structures to ensure the safety and reliability of drinking water in accordance with national water policy.

vii. Implement Technically Sound and Coordinated Interventions

All interventions should be timely, coordinated across stakeholders, and technically sound. This must include integrating source protection and Nature-based solutions, infrastructure development, and technical assessments to enhance the sustainability and resilience of water resources in Paro and Thimphu Dzongkhags.

8. CONCLUSION

The WRI in Paro and Thimphu Dzongkhags collected data for a total of 967 surface water sources, i.e., 472 in Paro Dzongkhag and 495 in Thimphu Dzongkhag, along with 32 borewells. There has been a substantial increase in the number of sources recorded during the inventory compared to the 2021 record (i.e., 237 sources in Paro and 145 sources in Thimphu). The inventory teams were able to record additional sources in consultation with the local communities and leverage on the training provided to them before the field work. Except for few sources, all the other sources recorded in 2021 were validated during this WRI. In Paro Dzongkhag, of the 237 sources recorded in 2021, 24 sources could not be validated as it could not be located while in Thimphu Dzongkhag, 13 sources from the 145 water sources recorded in 2021, could not be located.

In addition, data were also collected on the basic water quality parameters of the sources and the data shows that the water quality across both Dzongkhags is largely within acceptable standards for drinking, though small deviations in pH levels and other parameters in few sources warrant closer monitoring. Majority of the recorded sources are tapped for drinking and irrigation. From the recorded sources, the untapped sources include 97 from Paro Dzongkhag and 169 from Thimphu Dzongkhag.

The WRI recorded five distinct types of water sources namely springs, streams, ponds, marsh/swamps and lakes in the two Dzongkhags. Springs (64.19%) and streams (49.09%) are the most widely used water sources in Paro Dzongkhag and Thimphu Dzongkhag respectively. Majority of the water sources in both Dzongkhags are perennial, offering year-round water availability. Despite having numerous perennial sources, water sources in Paro are exhibiting signs of stress with 3% (16) of the sources have completely dried up, while 25% (117) are currently in the process of drying. Similarly, in Thimphu, 0.4% (2) of the sources have dried, and 22% (110) are drying. Some of the reasons for drying water sources, according to perception of the communities, include climate change, forest degradation and deforestation due to logging, illegal felling and forest fires, natural calamities, and other anthropogenic activities such as road construction and developmental works.

Ecologically, these water sources also support varying degrees of biodiversity, though most records were observational and highlight the need for more systematic ecological assessments.

Meanwhile, watershed conditions remain largely favorable, with the majority categorized as Pristine or Normal yet a notable minority fall under the Degraded category, particularly in Blue Pine-dominated zones, flagging them as priority areas for restoration and protection.

To conclude, this inventory provides a robust foundation for evidence-based water governance and informed decision making. It underscores the urgent need for targeted interventions from improving infrastructure and monitoring systems to restoring degraded watersheds and planning for future water demand in both rural and urban contexts. Proactive and integrated water resource management in Paro and Thimphu Dzongkhags will be essential not only for ensuring sustainable water access but also for safeguarding ecosystems, livelihoods, and long-term resilience in the face of rapid environmental and socio-economic change.

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ANNEXURE

Annexure 1. Data collection format

Data Collection Form for Water Resource Inventory in Paro and Thimphu Dzongkhags

1. Name of the Recorder:	**2. Email:**	**3. Contact No:**	**4. Office:**
5. Date *(dd/mm/yyyy)***:**	**6. Dzongkhag:**	**7. Gewog:**	**8. Chiwog:**
9. Village:	**10. Weather*:**	**11. Last precipitation**:**	**12. Was the water source recorded during NWRI 2021? (***Yes/No***)**
13. Water Source ID: *If answer is **Yes** for **Sl.No.12**, write the Sl.No. provided during NWRI 2021 for the source. If answer is **No,** provide ID no. above 10,000.*	**14. Name of the water source:** *If the source was recorded during NWRI 2021, write the same source name from the NWRI 2021. **Take a photo of the water source & save it as source name.***		
15. Location (coordinates) of the water source *(in decimal degree***) -** *Ensure accuracy of less than 10*	**Lat:**	**Long:**	
16. Altitude of water source *(m):*	**17. Where does the water source fall? *** **	**18. Type of water source****:**	**19. Is the water source seasonal or perennial? *****
20. Discharge *(liters/second):*	**21. Discharge method/ equipment******:**	**22. Was discharge take from the point of origin of water source?** *(Yes/No)*	
23. Approximate area of lakes/ponds/swamps/marshes *(in m^2). If source was recorded as spring/stream/river/borewell, enter area as 0.*	**24. Status of the water source*******:** *Compare the discharge with the NWRI 2021 to decide on the status of the source. If the source is new, consult with local guide.*		
25. Reason(s) for water source drying/dried (*Need to fill this if the status under **Sl. No. 24** is Dried up or Drying***):***			
26. Information on Basic Water Quality			
EC (µS/cm)	**pH**	**Salinity** (ppt)	**Temp** (°C)	**TDS** (mg/L or ppm)	**Is the water turbid?** *(Yes/No)*
27. Watershed class of the water source******:**	**28. Major forest type*********:**	**29. Water source use**********:**	
30. No. of Households (incl. Institutions) depending on water source *(Enter "0" if recorded as untapped under Sl.No.29.)*	**31. Population using water source** *(Enter "0" if recorded as untapped under Sl.No.29.)*		
32. Type of water infrastructure within the vicinity of the source******** (Take photos of all the infrastructures & save it accordingly):**	**33. If infrastructure type selected is "Others" in Sl.No.32, then mention the type:**		
34. Presence of aquatic biodiversity (if any)******** Multiple evidences can be recorded:**			
35. Any other comments/observations?			

Reference for filling in the Data Collection Form for Water Resource Inventory

* **Weather (at the time of sampling):**	1 = Cloudy; **2 = Hailstorm**; 3 = Heavy rain; **4 = Heavy snowfall**; 5 = Light rain; **6 = Light snowfall**; 7 = Partly sunny/partly cloudy; **8 = Sunny**; 9 = Others (specify)
** **Last precipitation (rainfall/snowfall) observed:**	1 = Within the past week (<=7 days); **2 = 1 to 2 weeks ago (8-14 days ago)**; 3 = 2 to 3 weeks ago (15-21 days ago); **4 = More than 3 weeks ago (>=22 days).**
*** **Where does the water source fall?**	1 = Private land; **2 = State Reserved Forest (SRF) Land**
**** **Type of water source:**	1 = Lake; **2 = Marsh/swamp**; 3= Pond; **4 = River**; 5= Spring. **6 = Stream;** 7 = Borewell
***** **Is the water source seasonal or perennial?**	1 = Perennial; **2 = Seasonal**; 3 = Not sure
****** **Discharge method/equipment**	1 = Float method; **2 = Global Water Float Probe (FP111)**; 3 = HACH Portable Velocity Meter (FH950); **4 = Volumetric/bucket method;** 5 = Level drop/ponding method; **6 = Not applicable**
******* **Status of the water source**	1= Dried up; **2 = Drying**; 3 = Increased; **4 = No change;** 5 = No idea
******** **Watershed Class of the water source:**	1= Critical; **2 = Degraded**; 3 = Normal; **4 = Pristine**
********* **Major forest type**	1 = Bluepine forest; **2= Chirpine forest**; 3 = Cool broadleaved forest; **4 = Dry alpine forest**; 5 = Evergreen Oak forest; **6= Fir forest**; 7 = Hemlock forest; **8 = Juniper Rhododendron scrub**; 9 = Non-forested area; **10 = Spruce forest**; 11 = Sub-tropical forest; **12 = Warm broadleaved forest**
********** **Water source use:**	1= Commercial/cottage industries (mineral water, beer, paper making, dye, workshops, etc.); **2 = Irrigation**; 3 = Rural drinking; **4 = Urban and peri-urban drinking**; 5 = All the above; **6 = Untapped**
********** **Type of water infrastructure within the vicinity of the source**	1= Concrete intake; **2 = Stone intake**; 3 = Concrete sedimentation tank; **4 = Ferro cement sedimentation tank**; 5 = HDPE pipe**; 6 = GI pipe**; 7 = Drums; **8 = Earthen/stone tank;** 9 = PVC tank; **10 = Zinc Alum tank**; 11 = Others; **12 = None**
********** **Presence of aquatic biodiversity (if any)**	1= Algae; **2 = Aquatic birds**; 3 = Aquatic invertebrates; **4 = Aquatic vegetation**; 5 = Fish; **6 = No evidence**

Note: For classification of watersheds, use the Watershed Classification Guideline, 2016.

Annexure 2. Methodology

The WRI was carried out in the two Dzongkhags of Paro and Thimphu covering 10 Gewogs and eight Gewogs respectively. The inventory was carried out by teams composed of staff from the DoW and the Department of Forests and Park Services (DoFPS). Unlike the assessment and mapping of water sources conducted nationwide in 2021 by the Watershed Management Division, DoFPS, wherein only the tapped water sources were enumerated and mapped, this inventory not only recorded the tapped water sources but also the untapped (potential) water sources. The water sources recorded and georeferenced during the 2021 inventory were also revisited in Paro and Thimphu Dzongkhags to revalidate its status and collect additional information including basic physical water quality parameters, presence of biodiversity and water infrastructures.

1. Data Collection

The water source inventory in Paro and Thimphu Dzongkhags was strategically scheduled to coincide with the dry season, a period characterized by low water flow, to capture critical baseline information. Accordingly, field data collection was carried out over a span of one month, from March to April 2025, to ensure consistency and reliability of data under lean flow conditions.

Prior to the field data collection, all the water sources recorded during 2021 for Paro and Thimphu Dzongkhags were sorted and organized using the Geographic Information System (GIS). These sources were mapped Gewog-wise to visualize their spatial distribution, which served as a critical tool in guiding the inventory teams to efficiently locate and assess each source during the fieldwork. In addition, using the GIS, the drainage systems in the Dzongkhags were overlaid on the maps to guide the team in locating the new and potential water sources in the Dzongkhags.

The water sources within each Gewog, including previously recorded sources, were inventoried. The sources that were inventoried in 2021 were validated and recorded as old sources while the additional sources identified were recorded as new sources. In case of water sources with multiple tapping points, the data was collected from above the top most tapping point. For untapped sources, the measurements were taken above the settlement or at the uppermost accessible points.

Data collection was primarily conducted using Epicollect5, a free and user-friendly mobile application designed for online field data collection. To ensure data security and facilitate future reference, parallel entries were also maintained using paper-based forms. Each water source was documented with photographs, geographic coordinates, and physical water quality parameters, among other relevant information. The physical water quality parameters were collected using

the PCS tester (Apera PC60 Premium Multi-Parameter Tester). The standardized data collection format as per Annexure 1 was used to collect data during the inventory. The inventory process followed a structured approach, with the following key steps undertaken during data collection:

1.1. Water sources assessment through key informant interviews

Information on water sources, particularly their locations, current status, and the underlying causes of any observed changes, was gathered through consultations with key informants in each Gewog. The inventory teams were accompanied by local enumerators or guides, nominated by the respective Gewogs, who possessed in-depth knowledge of the water sources and also served as the key informants (Figure 151).

Figure 151: Key informant interviews (Photo- Sangay Choden, DoW & Tandin, JKSNR)

1.2. Geo-coordinates of water sources

The location coordinates of water sources were recorded using the Epicollect5 app. To ensure accuracy, these coordinates were cross-validated against data from the SW Map mobile application. Furthermore, Inventory teams used the SW Map to upload geo-coordinates from the 2021 water sources data, enabling them to efficiently track and locate previously recorded water sources in the field.

1.3. Discharge measurement

The discharge from the water sources were measured using the float, volumetric or bucket, and level drop or ponding methods. These are the conventional methods or techniques used to measure the water discharge from various water sources, especially when it was impossible to use equipment such as flow probes (Figure 152) or flow meters (Figure 153).

Figure 152: Discharge measurement using digital flow probe (Photo-Maxim Environmental & Kinley Dem, DoW)

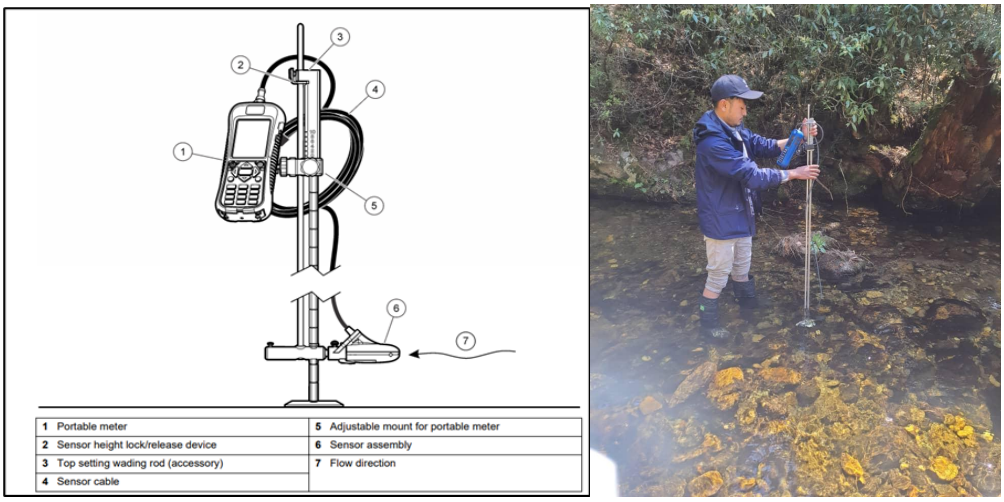

Figure 153: Discharge measurement using automatic magnetic flow meter (Photo- Budhi Man Rai, JKSNR)

A brief description of the above three conventional methods used during the inventory to measure the discharge/volume of water from water sources are provided below:

1.3.1. Float Method

The float method is a simple and cost-effective way to measure stream or river discharge (Figure 154 and Figure 155). It involves timing the movement of a floating object along a defined section of the water body involving the following steps:

- ➢ Choose a straight section of the stream with uniform flow and minimal turbulence.
- ➢ Ensure the streambed is free from large obstacles that could influence the float's movement.
- ➢ Mark the start and end points of the test section along the stream's length.

- ➢ Typically, this distance should be at least 5-10 times the width of the stream for better accuracy.
- ➢ Divide the stream width into multiple sections.
- ➢ Measure the depth at regular intervals across the stream.
- ➢ Calculate the total cross-sectional area by summing the widths multiply by their respective depths.
- ➢ Place a floating object (e.g., an orange, cork, or waterproof object) at the start of the test section.
- ➢ Use a stopwatch to time how long the float takes to travel from the start to the endpoint.
- ➢ Repeat this process several times at different points across the stream width and calculate the average surface velocity.
- ➢ Surface velocity is typically higher than the mean velocity due to reduced friction at the surface.
- ➢ Multiply the surface velocity by a correction factor, commonly between **0.8 and 0.9**, depending on the streambed roughness and flow conditions.
- ➢ Then, calculate discharge (Q) using the formula:

$$Q = A \times V$$

Where:

- A = Cross-sectional area (in square meters)
- V = Adjusted mean velocity (in meters per second)

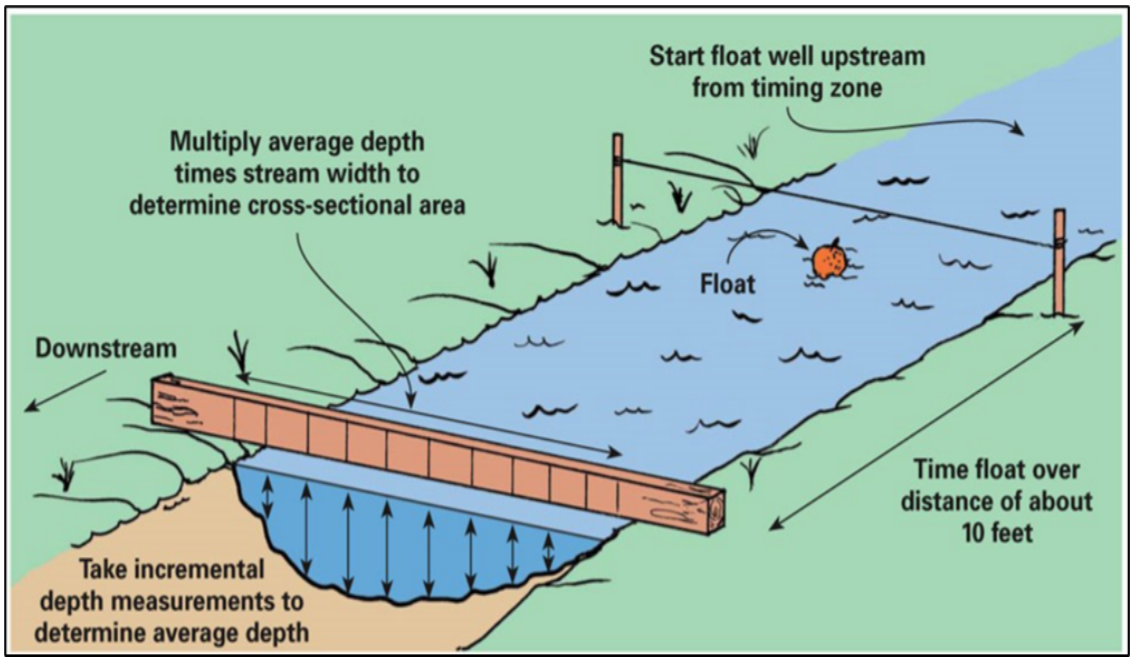

Figure 154: Illustration of float method

Figure 155: Inventory team using float method (Photo-Dorji Wangchuk, JDNP)

1.3.2. Volumetric or Bucket Method

It is a straightforward technique used to measure the flow rate of water, particularly in small streams or channels where the flow can be easily contained and directed (Figure 156). It involves measuring the time it takes for a known volume of water to accumulate in a container. It involves the following steps:

- ➢ Choose a location where the entire flow can be diverted or collected into a container without spillage.
- ➢ Ensure the site allows for easy handling of the collection container.
- ➢ Use a container with a known volume (e.g., a bucket or barrel).
- ➢ Have a stopwatch or timer ready to measure the filling time accurately.
- ➢ Channel the entire flow into the container using natural features or temporary barriers like sandbags or pipes.
- ➢ Ensure no water is lost during collection.
- ➢ Start the timer as the water begins to fill the container.
- ➢ Stop the timer when the container is full.
- ➢ To improve accuracy, repeat the process several times and calculate the average time.
- ➢ Then, calculate discharge (Q) using the formula:

$$Q = V/t$$

Where:

Q = Discharge (in cubic meters per second, m^3/s)
V = Volume of the container (in cubic meters, m^3)
t = Time taken to fill the container (in seconds)

Figure 156: Volumetric/Bucket method (Photo-Kinley Dem, DoW)

1.3.3. Level Drop or Ponding Method

It is a method used to measure the discharge in a small reservoir, pond, or other water body where the inflow and outflow can be controlled or accounted for (Figure 157). This method calculates discharge based on the rate at which the water level drops over a known surface area. The various steps involved in the ponding method are:

- ➢ Ensure that there is no inflow or outflow to the water body during the measurement period, or account for it separately.
- ➢ Choose a calm period with minimal disturbances like wind or waves.
- ➢ Determine the surface area (A) of the water body using maps, GPS, or direct measurement.
- ➢ Units should be in square meters (m^2) for consistency.
- ➢ Use a staff gauge, ruler, or other devices to measure the initial water level (h1).
- ➢ Allow water to discharge (e.g., through an outlet) for a specified period (t), ensuring no additional inflow or leakage.
- ➢ Record the final water level (h2).

➢ Then calculate volume change or volume (ΔV) of water discharged using the formula:

$$\Delta V = A \times \Delta h$$

Where:

- A = Surface area of the water body (m^2)
- $\Delta h = h_1 - h_2$ = Drop in water level (in meters)

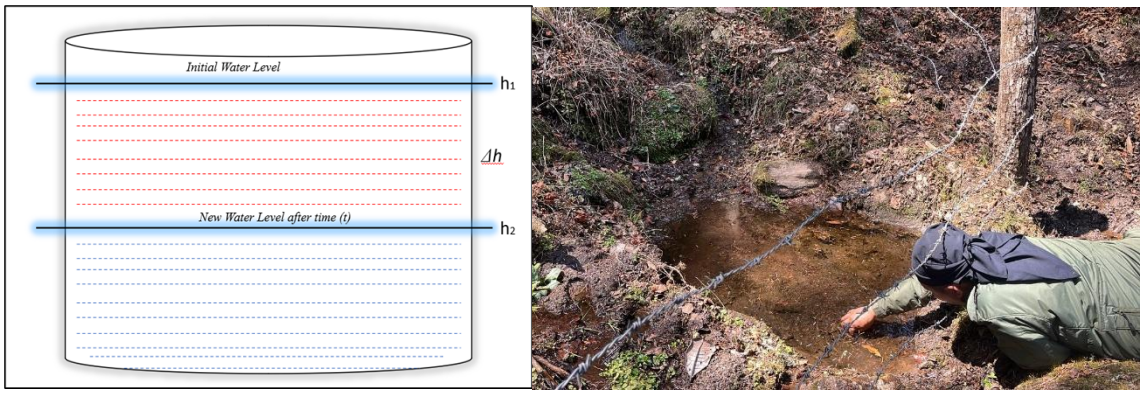

Figure 157: Level drop/ponding method (Photo-Rada Wangchuk, DoW)

1.4. Assessment of micro-watersheds of the water sources

The micro-watershed of each water source was assessed individually or in a cluster. While independent streams or springs were assessed individually, those springs and other water sources which were close to each other were grouped and assessed as one micro-watershed.

Micro-watershed assessments were done based on the condition of the micro-watersheds and downstream water users following the Watershed Classification Guideline, 2016. The assessment was carried out to understand the health of the micro-watersheds contributing to the water sources and to help in designing intervention measures to conserve and improve the conditions of the watersheds.

1.5. Data compilation and analysis

The WRI data was downloaded from the Epicollect5 and cross validated with the paper-based data forms. The data cleaning, sorting and analysis were done using the Microsoft Excel. The spatial distribution of water sources was mapped using the QGIS (Ver.3.40.5-Bratislava).

Annexure 3. Water Resource Inventory Data

Paro Dzongkhag

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
1	Bumdra	Nechhu Shari	Tsento	27.493249	89.385281	3636	3	Increased	Normal	0.45
2	Chetogoenpa Jab	Jagarthang	Tsento	27.45346	89.334833	2697	0	Increased	Pristine	0.896
3	Nichephu	Jagarthang	Tsento	27.456817	89.329625	2638	135	Drying	Normal	23.6
4	Benjo 1 (stream), Docholum	Zamsa Chunji	Tsento	27.526677	89.345229	2758	30	No change	Normal	32.22
5	Benjo 2 (drinking), Zhingzophu	Zamsa Chunji	Tsento	27.520979	89.340666	2641	16	No change	Normal	0.457
6	Chariphu (Shana 1)	Yaksa Nubri	Tsento	27.616619	89.27077	2946	4	No change	Normal	3.516
7	Chidalum (Shana 2)	Yaksa Nubri	Tsento	27.611982	89.279103	2834	4	Drying	Normal	12.03
8	Chelam Rongchu	Namji Phondo	Tsento	27.488586	89.292345	2863	0	No change	Pristine	33.99
9	Zothangphu stream	Namji Phondo	Tsento	27.493079	89.294818	2789	0	No change	Pristine	52.6
10	Chudiphu Zachilungkha	Namji Phondo	Tsento	27.492232	89.292897	2703	0	Drying	Pristine	0.246
11	Chumigaypa	Yaksa Nubri	Tsento	27.71617	89.376493	4087	1	No change	Pristine	4.172
12	Chuyul	Shana Mitsi	Tsento	27.581891	89.300607	2776	5	Drying	Normal	37.56
13	Dochokha	Zamsa Chunji	Tsento	27.531461	89.341852	2923	2	No change	Normal	0.706

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
14	Drugyel Dzongchu, Kalungka	Namji Phondo	Tsento	27.508752	89.312026	2618	30	No change	Normal	6.721
15	Duli	Yaksa Nubri	Tsento	27.637247	89.155577	4225	0	Drying	Pristine	1.65
16	Gelongchewa	Yaksa Nubri	Tsento	27.71214	89.298447	4213	3	No change	Pristine	0.225
17	Gunitsawa School	Mitshig Shana	Tsento	27.591722	89.283159	2857	1	No change	Degraded	9.05
18	Khulumpa	Yaksa Nubri	Tsento	27.719178	89.338685	4044	5	No change	Normal	13.82
19	Komatsawa Rongchu	Nechhu Shari	Tsento	27.456187	89.32676	2744	80	No change	Normal	35.01
20	Kopichu	Yaksa Nubri	Tsento	27.704912	89.303911	4001	2	Drying	Pristine	1.039
21	Nyamtayee	Zamsa Chunji	Tsento	27.521091	89.360137	3244	8	No change	Normal	1.625
22	Lemdo	Shana Mitsi	Tsento	27.570002	89.295007	2752	1	No change	Pristine	0.458
23	Lemdo Dangaphakha	Shana Mitsi	Tsento	27.5757	89.291265	2734	1	No change	Pristine	0.814
24	Leyna	Yaksa Nubri	Tsento	27.66215	89.185802	4179	0	No change	Pristine	4.338
25	Lomphu	Zamsa Chunji	Tsento	27.543198	89.303463	2702	25	No change	Normal	19.11
26	Lumbo chukha	Yaksa Nubri	Tsento	27.710688	89.36559	3919	3	No change	Normal	0.363

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
27	Metsi	Shana Mitsi	Tsento	27.547146	89.317157	2597	10	No change	Normal	1.61
28	Khemphuna water source	Namji Phondo	Tsento	27.480082	89.321895	2668	2	No change	Normal	0.223
29	Jitsephu rongchu (Nepla 3)	Namji Phondo	Tsento	27.477307	89.322895	2583	26	No change	Normal	8.06
30	Rundophu chu,Chunji	Zamsa Chunji	Tsento	27.523635	89.314576	2629	16	No change	Normal	19.22
31	RBA Camp Gunitsawa	Mitshig Shana	Tsento	27.59948	89.290227	2778	8	No change	Normal	9.335
32	Rikthu	Yaksa Nubri	Tsento	27.711188	89.360823	4093	5	No change	Normal	0.159
33	Shomona	Yaksa Nubri	Tsento	27.696921	89.206177	4331	0	No change	Pristine	26.07
34	Simshing	Yaksa Nubri	Tsento	27.708543	89.321814	4221	5	Drying	Normal	0.05
35	Taktshang 2 (Below Zimchung sarp)	Nechhu Shari	Tsento	27.49371	89.358773	3102	0	Dried up	Normal	0
36	Yoeselgang lhakhang source	Nechhu Shari	Tsento	27.498237	89.376543	2546	7	No change	Normal	1.389
37	Atsho Pema lungo	Namji Phondo	Tsento	27.474658	89.358988	2544	16	No change	Normal	0.182
38	Thangthangkha	Yaksa Nubri	Tsento	27.70679	89.288483	3541	1	No change	Normal	0.035
39	Tongzhi chorten tsawa	Shana Mitsi	Tsento	27.531613	89.327243	2562	5	No change	Normal	1.172

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
40	Yogaphu stream	Shana Mitsi	Tsento	27.541425	89.329293	2656	8	No change	Normal	22.36
41	Zamsa Tonga 1, (Jamtshang Bjatsa)	Zamsa Chunji	Tsento	27.516669	89.352547	2791	30	No change	Normal	50.94
42	Zamsa Tonga 2, (Dhamphu)	Zamsa Chunji	Tsento	27.51051	89.341175	2670	13	No change	Normal	0.443
43	Zaroto	Yaksa Nubri	Tsento	27.711043	89.287392	3628	1	Drying	Pristine	0.309
44	Tarikongsa chhu	Yaksa Nubri	Tsento	27.718871	89.282493	3657	0	No change	Pristine	0.82
45	Tarikongsa	Yaksa Nubri	Tsento	27.718515	89.282807	3653	0	No change	Pristine	0.939
46	Tarikongsa	Yaksa Nubri	Tsento	27.71835	89.283084	3647	0	No change	Pristine	0.271
47	Tarikongsa	Yaksa Nubri	Tsento	27.717851	89.284999	3642	0	No change	Pristine	0.789
48	Zaluto	Yaksa Nubri	Tsento	27.716976	89.285841	3653	0	No change	Pristine	0.107
49	Khagona chhu	Yaksa Nubri	Tsento	27.700209	89.216356	4371	3	No change	Pristine	21.58
50	Gaychu	Yaksa Nubri	Tsento	27.696523	89.219112	4389	0	No change	Pristine	2
51	Changza chumi	Yaksa Nubri	Tsento	27.695808	89.209104	4423	2	No change	Pristine	0.366
52	Trimola chu	Yaksa Nubri	Tsento	27.691279	89.205868	4306	0	No change	Pristine	14.08

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
53	Gomchi	Yaksa Nubri	Tsento	27.678385	89.206912	4431	1	No change	Pristine	0.0598
54	Taynongma chu	Yaksa Nubri	Tsento	27.676305	89.203032	4411	0	No change	Pristine	0.9
55	Taynongma	Yaksa Nubri	Tsento	27.675097	89.203742	4247	1	No change	Pristine	0.23
56	Ongdo thungchu	Yaksa Nubri	Tsento	27.668683	89.194012	4182	1	No change	Pristine	0.05
57	Metotshe stream	Yaksa Nubri	Tsento	27.66884	89.193991	4202	0	No change	Pristine	22.34
58	Jachu	Yaksa Nubri	Tsento	27.663825	89.184944	4232	5	No change	Normal	0.209
59	Leyna lhakhang chu	Yaksa Nubri	Tsento	27.66333	89.185665	4224	5	No change	Normal	0.101
60	Jedula chu	Yaksa Nubri	Tsento	27.647182	89.152931	4276	0	No idea	Pristine	16.09
61	Duli water source	Yaksa Nubri	Tsento	27.636552	89.15454	4228	3	No change	Normal	0.34
62	Khomo chu	Yaksa Nubri	Tsento	27.639572	89.154575	4208	0	No change	Pristine	2.081
63	Chumi kami chu	Yaksa Nubri	Tsento	27.655745	89.173138	4235	0	No change	Pristine	46.07
64	Gayza drinking source	Yaksa Nubri	Tsento	27.666312	89.2272	3971	1	No change	Pristine	0.496
65	Gayza drinking source 2	Yaksa Nubri	Tsento	27.666988	89.227948	3973	2	No change	Pristine	0.577

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
66	Chekha RBA source	Yaksa Nubri	Tsento	27.662632	89.239118	3873	1	No change	Normal	0.038
67	Chekha stream	Yaksa Nubri	Tsento	27.66219	89.238733	3799	0	No change	Pristine	0.615
68	Chuzorow chu	Yaksa Nubri	Tsento	27.711922	89.382085	3885	0	No change	Pristine	21.72
69	Gangchukarmo chu	Yaksa Nubri	Tsento	27.712632	89.376575	3925	0	No change	Pristine	59.95
70	Lamay chukha	Yaksa Nubri	Tsento	27.701273	89.321228	3770	0	No change	Pristine	0.506
71	Zaruto	Yaksa Nubri	Tsento	27.716238	89.286355	3618	0	No change	Pristine	3.967
72	Bjethaykabu	Yaksa Nubri	Tsento	27.683927	89.27264	3393	1	No change	Pristine	0.674
73	Thongdhoju	Yaksa Nubri	Tsento	27.662212	89.264865	3138	0	No idea	Pristine	23.38
74	Shingkharap water source	Yaksa Nubri	Tsento	27.643562	89.256462	3111	1	No change	Pristine	5.214
75	Tashithangka	Yaksa Nubri	Tsento	27.629984	89.255275	3092	0	No change	Pristine	2.5
76	Dungbaychu	Yaksa Nubri	Tsento	27.623537	89.254402	2926	0	No change	Pristine	156.8
77	Lekirichu	Yaksa Nubri	Tsento	27.616232	89.261069	2936	0	No change	Pristine	6.372
78	Thongbu chu	Shana Mitsi	Tsento	27.606634	89.287615	2798	0	No change	Pristine	148.2

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
79	Kurphakha	Mitshig Shana	Tsento	27.592163	89.283462	2833	0	No change	Pristine	32.57
80	Tourist camp chu, Gunitsawa	Shana Mitsi	Tsento	27.607453	89.279673	2816	0	No change	Pristine	2.595
81	Tsasaythang chu	Shana Mitsi	Tsento	27.594208	89.292525	2807	3	No change	Normal	0.751
82	Wachaysema BHU	Shana Mitsi	Tsento	27.590038	89.294333	2762	3	No change	Pristine	10.07
83	Lhading goenpa chu	Shana Mitsi	Tsento	27.574985	89.31406	3160	11	No change	Normal	0.738
84	Damjo	Shana Mitsi	Tsento	27.566935	89.301193	2756	2	No change	Normal	0.87
85	Lemdo rongchu	Shana Mitsi	Tsento	27.575039	89.296872	2684	6	No change	Normal	113.2
86	Jabaw	Shana Mitsi	Tsento	27.57308	89.301457	2687	0	No change	Pristine	0.8
87	Bayshi Chorten	Shana Mitsi	Tsento	27.570945	89.304963	2644	0	No change	Pristine	5.264
88	Zangkhajap	Shana Mitsi	Tsento	27.568234	89.307325	2711	4	No change	Normal	0.469
89	Denchukha	Shana Mitsi	Tsento	27.558895	89.321882	2873	15	No change	Normal	0.706
90	Zangkephu rongchu	Shana Mitsi	Tsento	27.558677	89.318203	2730	85	No change	Degraded	60.24

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
91	Mitsi zampa Lhakhang	Zamsa Chunji	Tsento	27.53516	89.316742	2576	3	No change	Normal	1.055
92	Pangchukabu	Zamsa Chunji	Tsento	27.533252	89.316755	2639	18	No change	Normal	1.116
93	Shingka thang	Zamsa Chunji	Tsento	27.521278	89.315325	2596	16	No change	Normal	1.14
94	Yoga lungka	Shana Mitsi	Tsento	27.543333	89.331401	2650	15	No change	Normal	1.14
95	Dangu drinking	Shana Mitsi	Tsento	27.542062	89.33225	2711	12	Drying	Normal	1.757
96	Dangu irrigation	Shana Mitsi	Tsento	27.541648	89.331855	2707	13	No change	Normal	1.865
97	Dochokha chu	Zamsa Chunji	Tsento	27.530565	89.348773	2926	0	No change	Pristine	1.266
98	Chajangtsho	Zamsa Chunji	Tsento	27.512738	89.344233	2720	35	No change	Normal	10.64
99	Chudiphu drinking source	Namji Phondo	Tsento	27.495245	89.299397	2880	5	No change	Normal	1.041
100	Kemsukha (Near Himalayan Keys Forest Resort)	Namji Phondo	Tsento	27.489276	89.307778	2687	40	No change	Degraded	6.89
101	Namdalungka spring	Namji Phondo	Tsento	27.492468	89.309632	2629	3	No idea	Normal	0.202
102	Balakha rongchu	Namji Phondo	Tsento	27.49201	89.310661	2646	100	No change	Degraded	86.62
103	Gemjangu water source	Namji Phondo	Tsento	27.487243	89.322217	2612	3	No change	Normal	0.109

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
104	Kanjukha water source	Namji Phondo	Tsento	27.483327	89.324523	2508	6	No change	Normal	0.393
105	Nepla (Jitsephu source)	Namji Phondo	Tsento	27.476687	89.324102	2593	11	No change	Normal	1.903
106	Aja Resort water source	Nechhu Shari	Tsento	27.458207	89.333527	2533	1	No change	Normal	0.262
107	Jagarthang, Lango water source	Nechhu Shari	Tsento	27.456775	89.333245	2604	100	No change	Degraded	3.975
108	Tenchoekhor dratshang source	Nechhu Shari	Tsento	27.4555	89.329535	2660	1	No change	Normal	1.312
109	Nechephu community source	Nechhu Shari	Tsento	27.456489	89.328096	2642	80	No change	Normal	2.669
110	Dungsi goenpa source	Nechhu Shari	Tsento	27.462205	89.32853	2762	1	No change	Pristine	0.481
111	Gelong mapelma drupchu	Nechhu Shari	Tsento	27.472437	89.340703	2449	1	Drying	Pristine	0.012
112	Zhamalungpa	Nechhu Shari	Tsento	27.486627	89.362467	2591	20	No change	Normal	0.811
113	Bjagoe water source	Nechhu Shari	Tsento	27.484197	89.368093	2661	16	No change	Normal	0.461
114	Tshemaytsa	Nechhu Shari	Tsento	27.486352	89.345047	2434	9	No change	Normal	0.205
115	Chugulungka source	Nechhu Shari	Tsento	27.482781	89.347163	2446	2	No change	Normal	0.049

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
116	Taktshang cafe source	Nechhu Shari	Tsento	27.495792	89.35541	3029	1	No change	Normal	1.198
117	Taktshang shedra source	Nechhu Shari	Tsento	27.499943	89.365617	3385	4	Drying	Normal	0.108
118	Sheka Rongchu	Nechhu Shari	Tsento	27.495589	89.36397	3190	20	No change	Normal	4.577
119	Bjagoe 2	Nechhu Shari	Tsento	27.481322	89.370328	2644	5	No change	Normal	1.513
120	Bjagoe rongchu 1	Nechhu Shari	Tsento	27.483148	89.367835	2651	10	No change	Normal	7.741
121	Chuthona	Zamsa Chunji	Tsento	27.541961	89.365054	3764	3	No idea	Normal	1.43
122	Bumdra drupchu	Nechhu Shari	Tsento	27.504934	89.380585	3788	0	Drying	Pristine	0.07
123	Nichephu 1	Jagarthang	Tsento	27.456773	89.330147	2629	0	No idea	Pristine	0.952
124	Nichephu 2	Jagarthang	Tsento	27.455941	89.329888	2650	1	Drying	Normal	1.792
125	Nichephu 3	Jagarthang	Tsento	27.452482	89.331464	2785	0	No idea	Pristine	2.477
126	Choekhordeysa	Phooshar	Doteng	27.525346	89.456834	2586	1	Increased	Pristine	13
127	Hosipang	Kempa Kuduphu	Doteng	27.466461	89.441745	2737	3	Drying	Pristine	0.038
128	Choteyrikha	Aatsho Phunoob	Doteng	27.490874	89.428708	2367	1	Drying	Pristine	0.19
129	Dabamenchu	Phooshar	Doteng	27.512561	89.452554	2526	1	Increased	Pristine	0.53
130	Damarongchu	Phooshar	Doteng	27.514191	89.450588	2514	13	Increased	Pristine	23
131	Draygaypangtshochu	Aatsho Phunoob	Doteng	27.50509	89.424256	2501	1000	Increased	Pristine	279
132	Gangchu 1	Joogar Pachhu	Doteng	27.478507	89.447251	2542	82	Drying	Pristine	14
133	Gaybayshangchu	Aatsho Phunoob	Doteng	27.502156	89.416139	2625	50	Drying	Pristine	4.8
134	Guruphaytshochu	Phooshar	Doteng	27.560116	89.44729	2891	0	Increased	Pristine	41.5

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
135	Kataysaychu	Jabji Loogchhoed	Doteng	27.481032	89.416662	2512	100	Drying	Pristine	2.1
136	Khotaysaychu	Chhubar	Doteng	27.496116	89.444059	2436	23	Increased	Pristine	61
137	Kichulum	Aatsho Phunoob	Doteng	27.488464	89.426946	2384	1	Drying	Pristine	0.031
138	Sanalungchu	Aatsho Phunoob	Doteng	27.500195	89.415134	2630	38	Increased	Pristine	53.75
139	Sayghilungchu	Phooshar	Doteng	27.520283	89.455486	2512	13	Increased	Pristine	45
140	Sayghizachu	Phooshar	Doteng	27.543417	89.456018	2727	0	Increased	Pristine	0.05
141	Wocheylum	Aatsho Phunoob	Doteng	27.490568	89.427241	2406	4	Drying	Pristine	0.36
142	Yangpaylungchu	Chhubar	Doteng	27.488512	89.438463	2389	75	Drying	Pristine	0.52
143	Zapaykaylochu	Phooshar	Doteng	27.509317	89.450482	2499	7	Drying	Pristine	1.15
144	Zhingreelungchu	Phooshar	Doteng	27.508785	89.445678	2427	0	Dried up	Degraded	0
145	Choechongtse Jab	Phooshar	Doteng	27.486025	89.395024	3436	5	Increased	Normal	0.66
146	Pangbo	Aatsho Phunoob	Doteng	27.499077	89.426267	2466	1	No change	Pristine	0.39
147	Zurjab	Aatsho Phunoob	Doteng	27.495316	89.428479	2436	0	No change	Pristine	0.046
148	Sisilakha	Aatsho Phunoob	Doteng	27.509393	89.402182	3432	4	No idea	Pristine	1.27
149	Sisilakha 1	Aatsho Phunoob	Doteng	27.509335	89.402878	3378	0	No idea	Pristine	1.03
150	Wagaluchu	Jabji Loogchhoed	Doteng	27.488941	89.396979	3306	100	No change	Pristine	1.27
151	Wagaluchu 1	Jabji Loogchhoed	Doteng	27.489155	89.398206	3269	100	No change	Pristine	0.14
152	Lamlakha	Jabji Loogchhoed	Doteng	27.488397	89.402785	3220	1	No change	Pristine	0.02

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153	Khandrocholing	Jabji Loogchhoed	Doteng	27.486312	89.40295	3199	3	No change	Pristine	0.2
154	Karma Goenpa Ka	Jabji Loogchhoed	Doteng	27.487185	89.418071	2654	3	Drying	Normal	0.07
155	Khotaysaychu	Chhubar	Doteng	27.496098	89.447087	2478	2	No change	Normal	61
156	Tara	Chhubar	Doteng	27.491606	89.437693	2369	1	No change	Pristine	0.495
157	Akshi	Chhubar	Doteng	27.487038	89.438068	2395	2	No change	Normal	0.26
158	Kothangkha	Chhubar	Doteng	27.490182	89.465903	2832	1	No change	Pristine	2.25
159	Legokha	Joogar Pachhu	Doteng	27.470919	89.436134	2523	12	Drying	Normal	0.22
160	Ramshingkhar	Aatsho Phunoob	Doteng	27.500052	89.423304	2522	1	No change	Pristine	0.24
161	Damtekha	Phooshar	Doteng	27.51221	89.467433	2914	10	No change	Normal	0.26
162	Lhakhang Sarpo source	Phooshar	Doteng	27.513249	89.460154	2652	1	No change	Pristine	0.64
163	Damachhu	Phooshar	Doteng	27.512445	89.452744	2514	1	No change	Pristine	2.2
164	Para Goenpa	Phooshar	Doteng	27.524148	89.439464	3094	6	No idea	Normal	0.11
165	Dungkona	Phooshar	Doteng	27.528164	89.433073	3367	5	No change	Pristine	0.29
166	Jongo Chu Thoensa	Phooshar	Doteng	27.539978	89.431662	3722	10	No change	Pristine	0.075

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167	Guru Phangtsho	Phooshar	Doteng	27.559065	89.440158	3203	1	No change	Pristine	37
168	Choeghodeysa	Phooshar	Doteng	27.532613	89.46469	2761	0	No idea	Pristine	33
169	Dragayphangtsho Chhu	Phooshar	Doteng	27.561287	89.383118	3935	2	No idea	Normal	29
170	Aumyelkhepong	Jipa Doezhi	Doteng	27.471738	89.411807	2452	160	Increased	Normal	5.7
171	Naysena	Rinchending Shari	Dopshari	27.444395	89.453754	2614	170	Increased	Normal	30.76
172	Bjakarp richoe	Damchena Jeshigang	Dopshari	27.434461	89.465557	3218	42	Increased	Normal	1.92
173	Chortendangrim	Damchena Jeshigang	Dopshari	27.433819	89.459866	2964	30	Increased	Normal	0.47
174	Chubana	Rinchending Shari	Dopshari	27.46038	89.46168	2749	250	Increased	Normal	8.25
175	Chudungdung	Damchena Jeshigang	Dopshari	27.428768	89.439701	2738	45	Drying	Degraded	0.21
176	Chudungdung 2	Damchena Jeshigang	Dopshari	27.430187	89.438401	2676	45	Increased	Degraded	0.46
177	Dachabsawog	Damchena Jeshigang	Dopshari	27.431632	89.447709	2819	25	Drying	Normal	0.055
178	Dopamo	Damchena Jeshigang	Dopshari	27.435102	89.443218	2705	53	Drying	Degraded	0.56
179	Dorizekha	Rinchending Shari	Dopshari	27.441749	89.454742	2655	5	Drying	Normal	0.57
180	Hinglungpa	Rinchending Shari	Dopshari	27.443131	89.440075	2424	20	Drying	Degraded	0.24
181	Maksa 1	Rinchending Shari	Dopshari	27.458019	89.454798	2764	0	Dried up	Degraded	0
182	Maksa 2	Rinchending Shari	Dopshari	27.459056	89.454547	2817	1	No change	Pristine	0.22
183	Maksa 3	Rinchending Shari	Dopshari	27.458953	89.455461	2798	2	Increased	Pristine	0.47
184	Richekha	Kempa Kuduphu	Dopshari	27.463778	89.435387	2520	1	Drying	Pristine	0.008
185	Rotazakha	Rinchending Shari	Dopshari	27.448962	89.426995	2252	5	Drying	Normal	0.57
186	Samakha	Rinchending Shari	Dopshari	27.449859	89.45341	2635	2	Drying	Pristine	0.15

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187	Saydotsawa	Damchena Jeshigang	Dopshari	27.430733	89.459602	3036	30	Drying	Normal	0.47
188	Seriphu	Rinchending Shari	Dopshari	27.445101	89.42829	2284	6	Drying	Pristine	0.25
189	Shingdacha	Damchena Jeshigang	Dopshari	27.436779	89.47049	3231	1	Increased	Pristine	1.09
190	Thachukha	Rinchending Shari	Dopshari	27.439637	89.437474	2439	5	Drying	Normal	1.12
191	Tongchuganey	Damchena Jeshigang	Dopshari	27.429761	89.457638	3049	20	Increased	Normal	0.66
192	Tshechumzagu	Kempa Kuduphu	Dopshari	27.457873	89.442825	2852	1	Drying	Pristine	0.01
193	Olachachu	Gaupel	Dopshari	27.429159	89.43222	2557	45	Increased	Degraded	1.83
194	Jela Dzong 1	Dochhoeten Neyphu	Dopshari	27.449552	89.482123	3539	1	Drying	Pristine	0.019
195	Wochhu	Jipa Doezhi	Dopshari	27.468996	89.413767	2426	0	Drying	Pristine	0.62
196	Shingkano	Kempa Kuduphu	Dopshari	27.463525	89.432602	2427	10	Drying	Pristine	0.05
197	Lamai saychhu	Damchena Jeshigang	Dopshari	27.43331	89.464622	3079	0	Increased	Pristine	0.117
198	Bjakarp lakha	Damchena Jeshigang	Dopshari	27.436206	89.469484	3191	0	Increased	Normal	0.48
199	Chortendangrim jab	Damchena Jeshigang	Dopshari	27.433777	89.459892	3031	25	Increased	Normal	1.008
200	Maksa 4	Rinchending Shari	Dopshari	27.459734	89.45753	2769	1	Drying	Pristine	0.35
201	Chubana 2	Rinchending Shari	Dopshari	27.457658	89.459744	2747	100	No change	Degraded	7.17
202	Bichhu	Rinchending Shari	Dopshari	27.454689	89.455714	2679	100	No change	Degraded	3.074
203	Dorizekha 2	Rinchending Shari	Dopshari	27.44102	89.444079	2500	70	Drying	Normal	2.068
204	Donomo	Gaupel	Hungrel	27.429218	89.430066	2497	53	Drying	Degraded	0.776
205	Genkha	Genkha	Hungrel	27.407622	89.474439	3232	3	Drying	Pristine	0.23
206	Jangsarbu drupchu	Hungrelkha	Hungrel	27.428786	89.422061	2237	0	Drying	Normal	0.101

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207	Menchujakhu	Hungrelkha	Hungrel	27.429542	89.421169	2239	2	Increased	Pristine	41.7
208	Pepchulo	Hungrelkha Jangsarbu	Hungrel	27.426016	89.427389	2384	25	Drying	Degraded	0.25
209	Tagungkha	Genkha	Hungrel	27.421996	89.479351	3433	15	Increased	Normal	0.31
210	Beagolo	Chang Jangtena	Hungrel	27.412741	89.455479	2596	95	Drying	Normal	5.149
211	Heashijang	Chang Jangtena	Hungrel	27.412208	89.455619	2583	135	Drying	Degraded	26.819
212	Chorten Tsawa	Hungrelkha Jangsarbu	Hungrel	27.427361	89.426398	2371	0	Drying	Degraded	0.337
213	Jangsarbu drupchhu pho	Hungrelkha	Hungrel	27.428767	89.422075	2237	0	Drying	Normal	0.195
214	Dhamna	Genkha	Hungrel	27.408545	89.475266	3236	0	No change	Pristine	0.07
215	Tshebum ney 1	Nabesa	Shaba	27.324826	89.418802	3256	12	Drying	Normal	16.247
216	Tshebum ney 2	Nabesa	Shaba	27.325887	89.415742	3258	35	Increased	Normal	19.155
217	Aye Mi tangsa	Dochhoeten Neyphu	Shaba	27.403513	89.491704	2785	65	Increased	Normal	13.141
218	Bara lungkha(Chumina)	Bara Zhingkana	Shaba	27.351797	89.471079	2263	51	Drying	Normal	1.11
219	Khariphuchu	Dochhoeten Neyphu	Shaba	27.391156	89.513007	3255	1	Increased	Normal	0.49
220	Bododingkha	Dochhoeten Neyphu	Shaba	27.385961	89.488376	2604	30	Increased	Normal	1.65
221	Damjilumpa	Dochhoeten Neyphu	Shaba	27.363503	89.486938	2937	0	Dried up	Degraded	0
222	Gongkuzingkha	Dochhoeten Neyphu	Shaba	27.360549	89.488536	2984	0	Dried up	Degraded	0
223	Jangtey Om	Dochhoeten Neyphu	Shaba	27.362012	89.488099	2742	0	Dried up	Degraded	0
224	Jim Naku	Chhukha Gangjoogkha	Shaba	27.320838	89.435286	2897	19	Increased	Normal	1.4
225	Bakhichen	Dochhoeten Neyphu	Shaba	27.355436	89.487113	2849	0	Dried up	Degraded	0

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226	Khenpa Lakha	Dochhoeten Neyphu	Shaba	27.386031	89.512341	3406	10	Increased	Normal	0.11
227	Leogokha	Dochhoeten Neyphu	Shaba	27.361071	89.48596	2922	0	Dried up	Degraded	0
228	Lholing Omchu	Dochhoeten Neyphu	Shaba	27.359792	89.485885	2907	0	Dried up	Degraded	0
229	Menchu	Dochhoeten Neyphu	Shaba	27.369176	89.495336	3460	0	Dried up	Degraded	0
230	Nab Rongchu	Chhukha Gangjoogkha	Shaba	27.325827	89.414521	3241	65	Drying	Normal	225.31
231	Ongkuru	Dochhoeten Neyphu	Shaba	27.36356	89.486759	2950	0	Dried up	Degraded	0
232	Phari	Dochhoeten Neyphu	Shaba	27.355947	89.49718	3082	0	Dried up	Degraded	0
233	Tshadosima 1	Bara Zhingkana	Shaba	27.376315	89.46898	2197	55	No idea	Normal	37.836
234	Tshathangkha	Chhukha Gangjoogkha	Shaba	27.32135	89.420573	3310	65	No change	Normal	1.33
235	Yoeli 1 (Dongdrasa menchhu)	Dochhoeten Neyphu	Shaba	27.404478	89.488816	2764	30	Drying	Normal	0.25
236	Yoeli 2	Dochhoeten Neyphu	Shaba	27.404466	89.488875	2780	30	Drying	Normal	2.508
237	Zamshina	Bara Zhingkana	Shaba	27.368783	89.474673	2587	38	Drying	Degraded	0.56
238	Zana	Dochhoeten Neyphu	Shaba	27.360021	89.484683	2877	0	Dried up	Degraded	0
239	Zana Drupchu	Dochhoeten Neyphu	Shaba	27.359545	89.48457	2870	1	Drying	Degraded	0
240	Jay Drupchhu	Dochhoeten Neyphu	Shaba	27.417721	89.493914	3634	0	Drying	Pristine	0.06
241	Drukpa Kuenley Drupchhu	Dochhoeten Neyphu	Shaba	27.414414	89.500622	3448	0	No change	Pristine	0
242	Tshadosina 2	Dochhoeten Neyphu	Shaba	27.375934	89.468278	2282	70	No change	Degraded	0.05

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243	Nab Rongchu 2	Chhukha Gangjoogkha	Shaba	27.325796	89.415042	3257	1	No change	Normal	1.15
244	Dhamjaygona	Chhukha Gangjoogkha	Shaba	27.31807	89.422802	3331	12	No change	Pristine	1.1
245	Gaykhokha	Chhukha Gangjoogkha	Shaba	27.312923	89.425476	3304	44	No change	Normal	7.004
246	Jim Naku 2	Chhukha Gangjoogkha	Shaba	27.320863	89.432992	3009	1	No idea	Pristine	0.194
247	Tshomina	Chhukha Gangjoogkha	Shaba	27.321339	89.435624	2903	2	No change	Pristine	0.195
248	Taligongkha	Chhukha Gangjoogkha	Shaba	27.311501	89.436595	2964	10	No change	Normal	0.37
249	Leptshegi	Chhukha Gangjoogkha	Shaba	27.319832	89.443617	2718	9	No change	Pristine	1.48
250	Khasuna	Chhukha Gangjoogkha	Shaba	27.3195	89.445673	2674	2	No change	Pristine	0.27
251	Ugyen Guru	Drujeydhingkha	Shaba	27.348992	89.420229	3213	0	No idea	Pristine	0.56
252	Damtsa Zingkha	Dochhoeten Neyphu	Shaba	27.378522	89.461387	2204	2	No change	Normal	0.09
253	Tsherina	Drujeydhingkha	Shaba	27.365793	89.450128	2341	43	No change	Normal	0.628
254	Dopcha	Nabesa	Shaba	27.325625	89.41496	3278	35	No change	Normal	1.833
255	Gangtey chosesea	Gaptey Olathang Tajoog	Wangchang	27.424755	89.411347	2275	2	Drying	Pristine	0.119

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256	Issue chosikha	Gaptey Olathang Tajoog	Wangchang	27.426536	89.410938	2247	14	Increased	Pristine	1.258
257	Jashichea	Chang Jangtena	Wangchang	27.402536	89.450916	2637	1	Increased	Normal	0.156
258	Menchuluka	Nakha Mendi	Wangchang	27.407088	89.445942	2482	0	Drying	Normal	0.053
259	Shingkhena	Chang Jangtena	Wangchang	27.394784	89.436821	2257	2	Increased	Normal	0.649
260	Tashicholing	Nakha Mendi	Wangchang	27.402563	89.444218	2448	2	Drying	Normal	0.06
261	Tshendentshea	Changmedthangka Khangkhu	Wangchang	27.419307	89.415978	2229	10	Drying	Pristine	2.075
262	Zenkuna	Mendrel Nakha	Wangchang	27.397339	89.432194	2232	0	Dried up	Degraded	0
263	Jagathangka menchu	Chang Jangtena	Wangchang	27.411142	89.453913	2541	1	Drying	Normal	0.013
264	Lomana Chungu	Gaptey Olathang Tajoog	Wangchang	27.425573	89.405001	2341	0	Drying	Pristine	0.2
265	Near DemaLhakhang	Changmedthangka Khangkhu	Wangchang	27.407951	89.400408	2781	0	No idea	Normal	0.193
266	Banalumchu	Ganju Kyidchhu	Lamgong	27.439152	89.345123	2598	240	Drying	Normal	11.914
267	Chanajanchu	Ngopa Shomo	Lamgong	27.417331	89.35636	2710	500	Drying	Normal	15.81
268	Chanamachu	Ngopa Shomo	Lamgong	27.418004	89.356424	2694	270	Increased	Degraded	80.144
269	Dachey chu	Chhukha	Lamgong	27.465958	89.363602	2487	20	Drying	Normal	1.559
270	Dachu	Jagarthang	Lamgong	27.453055	89.350004	2412	9	Increased	Normal	0.681
271	Dagophu	Ganju Kyidchhu	Lamgong	27.441621	89.343017	2614	260	Increased	Degraded	80.671
272	Dampalo	Ganju Kyidchhu	Lamgong	27.4373	89.349317	2554	7	Drying	Normal	0.763
273	Gayjab Gangju	Ganju Kyidchhu	Lamgong	27.439088	89.364564	2372	20	Increased	Normal	0.2
274	Jagyem	Tsendonang	Lamgong	27.463685	89.389162	2812	20	Drying	Normal	0.277

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275	Kungacholing	Tsendonang	Lamgong	27.460649	89.386225	2615	1	Increased	Normal	1.453
276	Menchu	Chhukha	Lamgong	27.456896	89.368901	2369	0	Drying	Normal	0.085
277	Nabcheylongo	Tsendonang	Lamgong	27.460079	89.381181	2466	50	Drying	Degraded	2.243
278	Phumana	Ganju Kyidchhu	Lamgong	27.440413	89.356496	2442	90	Drying	Degraded	15.544
279	Wachidingkha	Chhukha	Lamgong	27.463031	89.393972	2902	0	Drying	Pristine	0.075
280	Thangkha lhakhang menchu	Chhukha	Lamgong	27.461275	89.362297	2379	1	No change	Normal	0.094
281	Lagay chu	Ganju Kyidchhu	Lamgong	27.443366	89.335683	2755	2	Drying	Pristine	0.149
282	Jurmayse chu	Ganju Kyidchhu	Lamgong	27.441102	89.339576	2660	1	Drying	Pristine	0.47
283	Lamtaghi Tsecha	Ganju Kyidchhu	Lamgong	27.438382	89.348163	2559	0	No change	Pristine	0.091
284	Phumana 1	Ganju Kyidchhu	Lamgong	27.439163	89.356915	2457	40	No change	Degraded	4.942
285	Chimigem chu	Ngopa Shomo	Lungnyi	27.420592	89.364932	2619	80	Drying	Normal	0.974
286	Lungchuna	Ngopa Shomo	Lungnyi	27.418009	89.362204	2689	0	Increased	Normal	0.779
287	Bjagay men chu	Jieu Woochhu	Lungnyi	27.387767	89.394754	2690	0	Drying	Degraded	0.038
288	Chandana 1	Jieu Woochhu	Lungnyi	27.391634	89.357799	3105	0	Drying	Normal	2.347
289	Chanana 2	Changmedthangka Khangkhu	Lungnyi	27.392033	89.35963	3054	0	Increased	Normal	3.854
290	Chanana 3	Changmedthangka Khangkhu	Lungnyi	27.393322	89.360411	3042	0	Drying	Normal	1.155
291	Chanana 4	Jieu Woochhu	Lungnyi	27.395761	89.362027	3036	12	Increased	Normal	3.265
292	Chanana 5	Jieu Woochhu	Lungnyi	27.395811	89.362443	3045	0	Drying	Normal	1.592

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293	Chanana 6	Changmedthangka Khangkhu	Lungnyi	27.395384	89.36492	3070	0	Dried up	Degraded	0
294	Chukar 1	Jieu Woochhu	Lungnyi	27.388395	89.393652	2660	20	Increased	Normal	3.719
295	Chukar 2	Jieu Woochhu	Lungnyi	27.388207	89.393738	2657	20	Drying	Normal	1.132
296	Chukorzakha	Dzongdraag Gadraag	Lungnyi	27.381542	89.403093	2575	30	Drying	Normal	0.953
297	Damthanka 1	Jieu Woochhu	Lungnyi	27.392997	89.409814	2347	72	Increased	Degraded	132.569
298	Damthanka 2	Jieu Woochhu	Lungnyi	27.39167	89.410954	2336	9	Increased	Degraded	0.42
299	Dotachen 1	Jieu Woochhu	Lungnyi	27.380849	89.35619	3288	0	Drying	Normal	1.207
300	Dotachen 2	Jieu Woochhu	Lungnyi	27.379633	89.357334	3281	0	Increased	Normal	6.743
301	Dotachen 3	Jieu Woochhu	Lungnyi	27.378704	89.35888	3262	0	Increased	Normal	4.812
302	Dotachen 4	Jieu Woochhu	Lungnyi	27.37818	89.359289	3268	0	Increased	Normal	1.481
303	Dotaphu 2	Jieu Woochhu	Lungnyi	27.372794	89.382303	3114	0	Increased	Normal	0.697
304	Gata Rongchu	Dzongdraag Gadraag	Lungnyi	27.367837	89.406004	2494	250	Increased	Degraded	187.224
305	Jari 1	Pangbisa	Lungnyi	27.337073	89.401517	3202	0	Increased	Pristine	4.462
306	Jari 2	Pangbisa	Lungnyi	27.340452	89.407408	3222	0	Drying	Pristine	0.147
307	Jari 3	Pangbisa	Lungnyi	27.341069	89.408537	3202	0	Increased	Pristine	0.408
308	Jeli Yashi	Jieu Woochhu	Lungnyi	27.371587	89.371463	3205	0	Increased	Normal	2.042
309	Jomtasa	Jieu Woochhu	Lungnyi	27.397469	89.386072	2590	0	Drying	Normal	0.952
310	Menchulum	Dzongdraag Gadraag	Lungnyi	27.37133	89.394293	2823	0	No idea	Pristine	0
311	Pangsibtsa	Pangbisa	Lungnyi	27.344647	89.433638	2824	7	Drying	Normal	0.442
312	Tshoraykha	Dzongdraag Gadraag	Lungnyi	27.371034	89.394051	2826	70	Increased	Degraded	6.57
313	Wangdi lum 1	Jieu Woochhu	Lungnyi	27.370681	89.361711	3209	100	Increased	Normal	10.467

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314	Wangdi lum 2	Jieu Woochhu	Lungnyi	27.370816	89.362185	3250	0	Drying	Normal	0.254
315	Zachuluma	Dzongdraag Gadraag	Lungnyi	27.382971	89.403158	2564	35	Increased	Normal	1.581
316	Zhamjama	Pangbisa	Lungnyi	27.347136	89.428842	2895	15	Drying	Normal	4.803
317	Zophu ney chu	Jieu Woochhu	Lungnyi	27.391082	89.356596	3127	92	Increased	Normal	5.5
318	Gepjana Rongchu	Drujeydhingkha	Lungnyi	27.366573	89.405136	2514	160	Drying	Normal	153.882
319	Jaripong(Neuchumo)	Drujeydhingkha	Lungnyi	27.352013	89.415758	3192	46	No change	Degraded	0.19
320	Behind kela goenpa	Jieu Woochhu	Lungnyi	27.398928	89.350255	3396	97	Increased	Normal	1.857
321	Below tshendona road	Jieu Woochhu	Lungnyi	27.390353	89.355794	3133	0	Increased	Normal	0.513
322	Tshynalumpa	Changmedthangka Khangkhu	Lungnyi	27.39963	89.379789	2940	7	Drying	Normal	0.641
323	Tshorimo	Drujeydhingkha	Lungnyi	27.33243	89.406381	3334	46	No change	Normal	1.45
324	Damchi01	Jieu Woochhu	Lungnyi	27.387272	89.384951	2810	5	No change	Normal	0.147
325	Damchi02	Jieu Woochhu	Lungnyi	27.387521	89.386427	2790	5	No change	Normal	0.148
326	Bjagay Menchu01	Jieu Woochhu	Lungnyi	27.38678	89.393824	2740	3	No change	Normal	0.831
327	Tshozhawo	Jieu Woochhu	Lungnyi	27.397984	89.389321	2554	3	No change	Normal	0.438
328	Tshomeonchu	Jieu Woochhu	Lungnyi	27.396897	89.39019	2517	3	No change	Normal	1.134

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329	Tsoeram barmo	Jieu Woochhu	Lungnyi	27.377992	89.350285	3481	5	No change	Normal	0.871
330	Megoe lum	Jieu Woochhu	Lungnyi	27.388159	89.345677	3418	7	No change	Normal	1.508
331	Chandana top (Gaw ney okana	Jieu Woochhu	Lungnyi	27.396216	89.356645	3188	0	No change	Normal	1.857
332	Doptaphu	Jieu Woochhu	Lungnyi	27.377387	89.383728	3095	0	Increased	Normal	0.167
333	Menchulumpa	Dzongdraag Gadraag	Lungnyi	27.379038	89.403943	2546	1	No change	Normal	0.017
334	Zaachu	Pangbisa	Lungnyi	27.331298	89.416246	3374	0	No change	Pristine	0.2
335	Beside Ugyen Guru lhakhang	Pangbisa	Lungnyi	27.335025	89.420168	3232	0	Drying	Normal	0.963
336	Ugyen Guru Lhakhang tsho	Pangbisa	Lungnyi	27.333759	89.4231	3225	0	Drying	Degraded	0
337	Zonglela	Pangbisa	Lungnyi	27.335269	89.40648	3296	0	No idea	Pristine	0.288
338	Jari 4	Pangbisa	Lungnyi	27.352001	89.415848	3226	35	No change	Normal	0.249
339	Jewphu Top	Changmedthangka Khangkhu	Lungnyi	27.402413	89.393024	2672	2	No change	Normal	0.231
340	Damkuku	Dzongdraag Gadraag	Lungnyi	27.379951	89.418879	2357	20	Drying	Degraded	0.6
341	Labtshathangka	Dzongdraag Gadraag	Lungnyi	27.375013	89.42125	2496	2	No idea	Normal	0.111
342	Chaksa	Khamdraag Sali	Dogar	27.247246	89.491455	2950	7	Increased	Pristine	0.042
343	Chikar	Khamdraag Sali	Dogar	27.265516	89.483808	3061	10	Increased	Pristine	0.128

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344	Goemdralo	Goensakha Phuchhekha	Dogar	27.301974	89.515885	3081	40	Drying	Normal	0.101
345	Hashala-1	Dawakha Tshongkha	Dogar	27.290149	89.485668	3369	35	Drying	Pristine	0.195
346	Harshala2	Dawakha Tshongkha	Dogar	27.288788	89.485331	3397	26	Drying	Normal	0.476
347	Insuringo	Goensakha Phuchhekha	Dogar	27.299467	89.489405	3478	25	Increased	Pristine	0.07
348	Janeylum	Khamdraag Sali	Dogar	27.267452	89.495426	2605	5	No change	Pristine	0.058
349	Janilum	Khamdraag Sali	Dogar	27.272335	89.497121	2568	1	Drying	Normal	2.124
350	Janilumpa	Khamdraag Sali	Dogar	27.265126	89.492526	2697	27	Drying	Normal	1.02
351	Lakha	Khamdraag Sali	Dogar	27.250689	89.491762	2905	13	Drying	Normal	0.058
352	Neyphu	Tenchhekha Tsiphoog	Dogar	27.352115	89.524244	3046	17	Increased	Pristine	0.126
353	Ngyechu	Khamdraag Sali	Dogar	27.274469	89.457752	3299	800	Drying	Degraded	6.66
354	Sali-1	Khamdraag Sali	Dogar	27.250369	89.500801	2633	65	No change	Degraded	0.441
355	Sali-2	Khamdraag Sali	Dogar	27.250314	89.500924	2594	7	Increased	Pristine	0.264
356	Serchu	Khamdraag Sali	Dogar	27.27359	89.459976	3267	800	Drying	Degraded	4.97
357	Tsangtsekha	Khamdraag Sali	Dogar	27.252216	89.489886	2963	25	Increased	Normal	0.153
358	Nabi Rongchu 2	Chhukha Gangjoogkha	Dogar	27.312863	89.452304	2521	80	No change	Normal	70.193
359	Susuna Stream	Wanakha Zursuna	Dogar	27.236696	89.47902	2381	1	No change	Pristine	98.84
360	Susuna GREEF 2	Wanakha Zursuna	Dogar	27.235661	89.479627	2381	38	No idea	Pristine	4.06

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361	Laptsana	Goensakha Phuchhekha	Dogar	27.283587	89.465596	3590	40	Drying	Pristine	0.01
362	Laptsana 2	Dawakha Tshongkha	Dogar	27.284517	89.450092	3611	8	No change	Normal	1.151
363	Laptsana3	Goensakha Phuchhekha	Dogar	27.285035	89.45133	3620	40	No change	Normal	1.15
364	Tsigo	Goensakha Phuchhekha	Dogar	27.286288	89.477839	3536	40	No change	Normal	0.259
365	Judulum	Goensakha Phuchhekha	Dogar	27.303555	89.518144	3003	40	No idea	Normal	0.005
366	Lotsona	Khamdraag Sali	Dogar	27.253895	89.485244	3112	1	No change	Pristine	0.0345
367	Auzhi	Khamdraag Sali	Dogar	27.259485	89.47049	3332	20	No change	Pristine	0.652
368	Ngyechu-2	Khamdraag Sali	Dogar	27.269363	89.458475	3229	0	No idea	Pristine	1.39
369	Zilgolamchu	Khamdraag Sali	Dogar	27.262803	89.461128	3125	2	No idea	Pristine	0.097
370	Auzhi untapped	Khamdraag Sali	Dogar	27.259252	89.470862	3179	0	No idea	Pristine	0.075
371	Chikar Lhakhang	Khamdraag Sali	Dogar	27.27081	89.483264	3061	1	No idea	Pristine	0.074
372	Chikar Menchu	Khamdraag Sali	Dogar	27.268516	89.484547	3096	0	No idea	Pristine	0.055
373	Dotsemo	Khamdraag Sali	Dogar	27.271036	89.490422	2782	1	No idea	Pristine	0.096
374	Janilumpa-2	Khamdraag Sali	Dogar	27.272447	89.49264	2659	95	No idea	Normal	2.324
375	Dubthob Seychu	Khamdraag Sali	Dogar	27.247016	89.516866	2259	1	No change	Normal	0.101

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376	Dubthob Seychu-2	Khamdraag Sali	Dogar	27.249724	89.510381	2300	0	No change	Pristine	0.351
377	Gaywalumpa	Khamdraag Sali	Dogar	27.249786	89.510058	2316	1	No change	Normal	2.295
378	Gaywalumpa-2	Khamdraag Sali	Dogar	27.249809	89.510069	2316	0	No idea	Pristine	0.861
379	Sali Tsho	Khamdraag Sali	Dogar	27.241866	89.509517	2574	0	No change	Pristine	0.074
380	Salilumpa	Khamdraag Sali	Dogar	27.250616	89.502641	2606	2	No change	Pristine	0.163
381	Salilumpa-2	Khamdraag Sali	Dogar	27.250622	89.502603	2625	65	No change	Degraded	0.223
382	Sali Drubchu	Khamdraag Sali	Dogar	27.250753	89.502587	2585	0	No change	Pristine	0.02
383	Salilumpa-3	Khamdraag Sali	Dogar	27.250513	89.502821	2569	21	No change	Degraded	1.789
384	Boegamenchu	Khamdraag Sali	Dogar	27.251271	89.503963	2579	1	No change	Pristine	0.055
385	Langmatshong	Khamdraag Sali	Dogar	27.252078	89.506534	2523	33	No change	Normal	0.156
386	Below JeJepeak	Dawakha Tshongkha	Dogar	27.294282	89.508905	3047	1	Drying	Normal	0.0138
387	RNR Source-Below JiJi Peak	Dawakha Tshongkha	Dogar	27.294394	89.50904	3022	3	Drying	Normal	0.045
388	Tseygo	Goensakha Phuchhekha	Dogar	27.302403	89.491484	3357	9	Drying	Pristine	0.163

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389	Drolaykha	Goensakha Phuchhekha	Dogar	27.309713	89.516877	3093	24	Drying	Normal	0.047
390	Drolaykha-2	Goensakha Phuchhekha	Dogar	27.31022	89.518121	3012	24	No change	Normal	0.014
391	Isuringo-2	Goensakha Phuchhekha	Dogar	27.309071	89.494681	2944	13	Drying	Pristine	0.522
392	Langjala	Goensakha Phuchhekha	Dogar	27.310395	89.498682	2809	13	Drying	Pristine	0.013
393	Babja Goenpa Chu	Goensakha Phuchhekha	Dogar	27.29134	89.452755	3012	36	No change	Normal	3.45
394	Babja Rongchu	Mendrel Uesuna	Dogar	27.299647	89.445695	2807	0	No idea	Pristine	13.36
395	Bebjabi Chu	Mendrel Uesuna	Dogar	27.312875	89.452426	2532	88	No change	Normal	50.2
396	Issuna	Mendrel Uesuna	Dogar	27.321258	89.487005	2288	47	No idea	Pristine	5.6
397	Tshoshudhingkha	Dawakha Tshongkha	Dogar	27.29053	89.492273	3012	1	No change	Pristine	0.021
398	Thaymrichu	Dawakha Tshongkha	Dogar	27.290592	89.485293	3375	11	No change	Pristine	0.635
399	Tshoraychu	Dawakha Tshongkha	Dogar	27.290776	89.484638	3416	4	No idea	Pristine	0.126
400	Thaymritsawa	Dawakha Tshongkha	Dogar	27.284333	89.479595	3485	15	No idea	Pristine	0.173
401	Thaymritsawa-2	Dawakha Tshongkha	Dogar	27.282997	89.485033	3227	15	No idea	Pristine	0.049
402	Berichu	Dawakha Tshongkha	Dogar	27.287734	89.488957	3157	85	No change	Normal	0.128
403	Pudrugoenpachu	Dawakha Tshongkha	Dogar	27.289273	89.491202	3254	4	No idea	Pristine	0.032

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404	Chutsena	Dawakha Tshongkha	Dogar	27.285876	89.511576	2657	35	Drying	Normal	0.152
405	Shingkatsawa	Dawakha Tshongkha	Dogar	27.272269	89.504092	2469	25	No change	Normal	1.297
406	Khamdralum	Dawakha Tshongkha	Dogar	27.270481	89.50025	2468	40	No change	Normal	2.438
407	Zakha	Tenchhekha Tsiphoog	Dogar	27.335975	89.53111	2525	17	No change	Pristine	0.035
408	Neyphu-2	Tenchhekha Tsiphoog	Dogar	27.352836	89.523957	3046	17	No idea	Pristine	0.094
409	Neyphu 3	Tenchhekha Tsiphoog	Dogar	27.353151	89.523865	3095	17	No idea	Pristine	0.034
410	Dobjidrup Chu	Dawakha Tshongkha	Dogar	27.26722	89.52145	2240	1	No change	Normal	0.518
411	Kazhina-1	Dawakha Tshongkha	Dogar	27.282462	89.461947	3547	25	No change	Degraded	0.044
412	Kazhina-2	Dawakha Tshongkha	Dogar	27.28283	89.461428	3551	25	No change	Degraded	0.097
413	Kazhina-3	Dawakha Tshongkha	Dogar	27.279672	89.448703	3622	25	No change	Degraded	0.103
414	Kazhina-4	Dawakha Tshongkha	Dogar	27.279954	89.449546	3606	25	No change	Degraded	0.098
415	Above Chikar Goenpa	Dawakha Tshongkha	Dogar	27.27198	89.481873	3138	2	No idea	Pristine	0.032
416	Betikha School	Bueltikha Jagoen	Naja	27.247497	89.412492	2631	0	Dried up	Pristine	0
417	Kaylha-Domchu	Jazhina Tsuengoen	Naja	27.21596	89.465646	2684	4	Drying	Pristine	0.173

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418	Gumo	Bueltikha Jagoen	Naja	27.245317	89.406894	2507	31	Increased	Pristine	0.986
419	Bumpalumpa	Bueltikha Jagoen	Naja	27.254616	89.429008	3039	16	No change	Normal	3.588
420	Chimlagang	Jazhina Tsuengoen	Naja	27.206929	89.502004	2553	1	Drying	Pristine	0.146
421	Janana2	Jazhina Tsuengoen	Naja	27.206047	89.503515	2525	20	No change	Pristine	0.1
422	Janana3	Jazhina Tsuengoen	Naja	27.205026	89.502193	2597	3	No change	Pristine	0.1
423	Janana4	Jazhina Tsuengoen	Naja	27.20601	89.500845	2610	5	No change	Pristine	0.1
424	Devichu Wongm	Jazhina Tsuengoen	Naja	27.218349	89.456127	2618	1	Drying	Pristine	0.267
425	Nabana	Rangzhingang Tshebji	Naja	27.233344	89.433444	2708	7	Increased	Degraded	0.191
426	Domlayphu	Bemphu Lingzhi Nagu	Naja	27.2664	89.406268	2845	14	No idea	Pristine	9.5
427	Devichu	Jazhina Tsuengoen	Naja	27.221162	89.457785	2814	3	Drying	Pristine	0.121
428	Potsa	Jazhina Tsuengoen	Naja	27.215161	89.466256	2664	3	Increased	Pristine	0.159
429	Rashigang	Rangzhingang Tshebji	Naja	27.235671	89.440527	2850	130	Drying	Degraded	0.685
430	RNR Source	Bueltikha Jagoen	Naja	27.248539	89.41336	2665	6	Increased	Pristine	1.1009
431	Somchi	Bemphu Lingzhi Nagu	Naja	27.252887	89.400151	2679	2	No change	Pristine	0.08
432	Susuna Menchulum	Wanakha Zursuna	Naja	27.224233	89.488479	2448	3	Drying	Pristine	0.126
433	Susuna GREEF	Wanakha Zursuna	Naja	27.223266	89.488646	2460	3	Increased	Pristine	0.244

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434	Wanakha/Susuna	Wanakha Zursuna	Naja	27.227236	89.479914	2427	30	No change	Normal	0.633
435	Chutalum Chu	Bemphu Lingzhi Nagu	Naja	27.231719	89.371497	3032	10	No idea	Pristine	41.52
436	Chutalum Chu2	Bemphu Lingzhi Nagu	Naja	27.233712	89.372424	2924	0	No idea	Pristine	2.3
437	Lopsgongma	Bemphu Lingzhi Nagu	Naja	27.236332	89.372789	2915	1	No idea	Pristine	1.83
438	Ausheepangkha	Bemphu Lingzhi Nagu	Naja	27.24437	89.370306	2814	10	No idea	Prsitine	0.053
439	Khemshee	Bemphu Lingzhi Nagu	Naja	27.247396	89.367734	2699	1	No idea	Pristine	0.121
440	Gaylue	Bemphu Lingzhi Nagu	Naja	27.268351	89.344395	2969	18	No idea	Normal	6.63
441	Laptsho	Bemphu Lingzhi Nagu	Naja	27.261874	89.345445	2763	1	No idea	Normal	0.084
442	Wocheyna Chu	Bemphu Lingzhi Nagu	Naja	27.263516	89.352365	2720	3	No idea	Normal	22.52
443	Zaphu	Bemphu Lingzhi Nagu	Naja	27.265929	89.362716	2900	1	No idea	Normal	0.592
444	Zaphu Stream	Bemphu Lingzhi Nagu	Naja	27.26578	89.362167	2892	0	No idea	Normal	31.45
445	Tseychuna	Bemphu Lingzhi Nagu	Naja	27.269916	89.368374	2905	25	No idea	Normal	74.94

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446	Somdhachisa	Bemphu Lingzhi Nagu	Naja	27.269008	89.370428	3005	8	No idea	Normal	0.405
447	Dobjangkha	Bemphu Lingzhi Nagu	Naja	27.277986	89.378386	3323	13	No idea	Normal	0.86
448	Khamgyeney	Bemphu Lingzhi Nagu	Naja	27.277309	89.381883	3317	0	No idea	Pristine	0.462
449	Antago	Bemphu Lingzhi Nagu	Naja	27.275191	89.390722	3225	10	No idea	Pristine	0.991
450	Lungpa	Bemphu Lingzhi Nagu	Naja	27.288167	89.394346	3073	30	No idea	Pristine	173
451	Nagu Chu	Bemphu Lingzhi Nagu	Naja	27.266969	89.399828	2705	0	No idea	Pristine	199.6
452	Zhongkolumchu	Jazhina Tsuengoen	Naja	27.207048	89.480462	2567	5	Drying	Normal	0.027
453	Nagu Above Lhakhang	Bemphu Lingzhi Nagu	Naja	27.259422	89.399801	2705	6	No idea	Pristine	0.48
454	Chutalum Jabagonpa	Bueltikha Jagoen	Naja	27.258127	89.422035	3108	3	No change	Degraded	2.033
455	Sagolumchu	Bueltikha Jagoen	Naja	27.244608	89.431362	2847	10	No change	Pristine	1.876
456	Gangjablumchu	Bueltikha Jagoen	Naja	27.244548	89.427054	2744	2	No change	Pristine	2.516
457	Susuna 1	Wanakha Zursuna	Naja	27.230534	89.471573	2720	0	No idea	Normal	2.84
458	Susuna 2	Wanakha Zursuna	Naja	27.233478	89.463939	2818	0	No idea	Normal	0.331
459	Wanaka School Source	Wanakha Zursuna	Naja	27.239904	89.455585	2943	1	No change	Normal	0.771

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460	Dhachulum	Wanakha Zursuna	Naja	27.219341	89.484902	2710	40	No change	Normal	0.191
461	Gumomenchu	Wanakha Zursuna	Naja	27.20735	89.508368	2316	21	No change	Pristine	0.328
462	Shogaylum	Wanakha Zursuna	Naja	27.208695	89.506465	2375	40	No change	Pristine	0.376
463	Shogaylum (irrigation)	Wanakha Zursuna	Naja	27.208948	89.506853	2351	40	No change	Pristine	0.685
464	Taggzhin	Wanakha Zursuna	Naja	27.211261	89.501854	2493	18	Drying	Pristine	0.127
465	Gongkhaywongm	Wanakha Zursuna	Naja	27.208471	89.503047	2508	7	No change	Pristine	0.284
466	Jangsa	Jazhina Tsuengoen	Naja	27.219069	89.464204	2824	1	No idea	Pristine	0.104
467	Jazhina Pond	Jazhina Tsuengoen	Naja	27.213597	89.469921	2633	1	No change	Pristine	0.001
468	Jalazho	Bueltikha Jagoen	Naja	27.251375	89.396174	2516	2	No change	Pristine	0.03
469	Lungokha	Bueltikha Jagoen	Naja	27.239502	89.424656	2426	3	No idea	Pristine	0.23
470	Jagoen Drubchu	Bueltikha Jagoen	Naja	27.245429	89.420878	2608	1	No idea	Pristine	0.54
471	Damgo	Bemphu Lingzhi Nagu	Naja	27.265795	89.382744	2954	1	No idea	Pristine	0.14
472	Nagudu	Rangzhingang Tshebji	Naja	27.233143	89.447489	2916	130	Drying	Degraded	0.467

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Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
1	Gunglo	Gangyuel	Lingzhi	27.716198	89.447116	4177	2	Increased	Pristine	14
2	Gangyuel	Gangyuel	Lingzhi	27.889351	89.43753	3827	38	No change	Normal	197
3	Gyemtem	Chhuzarkha	Lingzhi	27.900186	89.458452	3927	30	Drying	Degraded	1.5
4	Gyuphu source 2	Chagphu	Lingzhi	27.850611	89.405494	4164	1	No idea	Normal	0.225
5	Lhalung source	Chhuzarkha	Lingzhi	27.898062	89.462193	3928	2	No change	Normal	0.23
6	Mingsel source	Chagphu	Lingzhi	27.860297	89.440205	4006	9	No change	Normal	2.6
7	Ngalum	Gangyuel	Lingzhi	27.891637	89.433203	3885	12	Drying	Normal	1.6
8	Phalalum (lingzhi dzong source)	Chagphu	Lingzhi	27.858053	89.426317	4212	1	Drying	Normal	0.2
9	Rateylum (range office source)	Chagphu	Lingzhi	27.86135	89.432528	4129	1	Drying	Normal	0.446
10	Rawlum	Gangyuel	Lingzhi	27.887443	89.435431	3864	20	Drying	Normal	0.3
11	Ruru source	Chagphu	Lingzhi	27.85699	89.424477	4233	1	Drying	Degraded	0.0529
12	Shagilum spring 2	Chagphu	Lingzhi	27.858496	89.428592	4125	1	Drying	Normal	0.1
13	Takilum source	Chagphu	Lingzhi	27.859644	89.429084	4145	1	Drying	Normal	1
14	Chuzagom	Gangyuel	Lingzhi	27.71892	89.459708	4139	1	No idea	Pristine	70
15	Majaphu	Gangyuel	Lingzhi	27.713212	89.443332	4183	1	No idea	Pristine	24
16	Jaridingtha source	Gangyuel	Lingzhi	27.739395	89.459979	4299	2	Increased	Pristine	72

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
17	Kishiding source	Gangyuel	Lingzhi	27.748285	89.463427	4418	2	No idea	Pristine	39
18	Jatim source	Gangyuel	Lingzhi	27.757498	89.472983	4614	0	No idea	Pristine	2.4
19	Dinye source	Gangyuel	Lingzhi	27.757582	89.469646	4564	2	No idea	Pristine	19
20	Jaridingtha source 2	Gangyuel	Lingzhi	27.740709	89.458769	4306	3	No idea	Pristine	6
21	Gedu tsho outlet	Gangyuel	Lingzhi	27.747879	89.458982	4462	0	No change	Pristine	12
22	Gedu tsho	Gangyuel	Lingzhi	27.758237	89.450712	4695	1	No change	Pristine	1.512
23	Gagongma tsho	Chagphu	Lingzhi	27.772461	89.441918	4703	1	No idea	Pristine	2.764
24	Gyuphu source	Gangyuel	Lingzhi	27.851213	89.40692	4196	2	No change	Degraded	0.214
25	Galo	Chagphu	Lingzhi	27.851084	89.395463	4280	1	No idea	Pristine	0.444
26	Buchuna	Chagphu	Lingzhi	27.848912	89.403307	4162	0	No change	Pristine	176
27	Tshokha chu	Chagphu	Lingzhi	27.846256	89.402588	4145	0	No change	Pristine	15
28	Chiphuthangsource	Chagphu	Lingzhi	27.842136	89.416207	4265	2	No change	Pristine	0.8
29	Chiphuthang stream	Chagphu	Lingzhi	27.842477	89.42619	4146	2	No change	Pristine	42
30	Chazhithang stream	Chagphu	Lingzhi	27.849104	89.425044	3980	0	No idea	Pristine	257
31	Chazhithang source	Chagphu	Lingzhi	27.84726	89.424913	3999	1	No idea	Pristine	0.214
32	Thuphu stream	Chagphu	Lingzhi	27.854866	89.448411	3851	0	No change	Pristine	1.3

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33	Thuphu main stream	Chagphu	Lingzhi	27.853866	89.450541	3860	2	No change	Normal	385
34	Thuphu spring	Chagphu	Lingzhi	27.853972	89.452019	3865	1	No change	Degraded	0.19
35	Ngolu chu	Chagphu	Lingzhi	27.835589	89.468528	4556	0	No change	Pristine	226
36	Ngolu chu 2	Chagphu	Lingzhi	27.83556	89.468524	4555	0	No change	Pristine	61
37	Mingsel stream	Chagphu	Lingzhi	27.857923	89.445118	3850	0	No change	Pristine	823
38	Shagilum stream 1	Chagphu	Lingzhi	27.858346	89.428712	4125	0	No idea	Normal	0.8
39	Panglu source (BHU source)	Chagphu	Lingzhi	27.861891	89.431197	4165	1	No idea	Normal	1.8
40	Panglu 2	Chagphu	Lingzhi	27.860925	89.430799	4145	1	No change	Pristine	0.412
41	Rateylum (school source)	Chagphu	Lingzhi	27.861295	89.432627	4120	4	No idea	Normal	0.3
42	Rateylum (Gewog source)	Chagphu	Lingzhi	27.860802	89.432847	4110	1	No idea	Normal	0.38
43	Rateylum (village)	Chagphu	Lingzhi	27.861522	89.433568	4092	1	No change	Normal	0.217
44	Rateylum village 2	Chagphu	Lingzhi	27.861678	89.435655	4071	1	No change	Normal	0.07
45	Rateylum village 3	Chagphu	Lingzhi	27.861369	89.436114	4071	3	No change	Normal	0.2

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46	Chukarbo	Gangyuel	Lingzhi	27.875805	89.40796	4000	0	No change	Pristine	110
47	Tando Drupchu	Gangyuel	Lingzhi	27.879152	89.410755	4084	2	No change	Pristine	0.05
48	Langnagu	Gangyuel	Lingzhi	27.892823	89.432332	3899	0	No change	Pristine	34
49	Thruechujow	Gangyuel	Lingzhi	27.89152	89.435605	3983	1	No change	Pristine	0.04
50	Chelulum source	Chagphu	Lingzhi	27.870181	89.443834	4006	5	No change	Pristine	1.8
51	Chebesa stream	Chhuzarkha	Lingzhi	27.903164	89.452122	3922	0	No change	Pristine	21
52	Chuzarkha	Chhuzarkha	Lingzhi	27.902383	89.454403	3899	2	No change	Pristine	1.7
53	Khangkhel stream	Chhuzarkha	Lingzhi	27.897443	89.458596	3836	0	No change	Normal	25
54	Lhalung 2	Chhuzarkha	Lingzhi	27.898037	89.462301	3912	1	No change	Pristine	0.52
55	Bayzachumera	Chhuzarkha	Lingzhi	27.885193	89.479772	3868	1	No change	Pristine	0.09
56	Dendhulham stream	Chhuzarkha	Lingzhi	27.879435	89.481875	3835	0	No change	Pristine	3
57	Tingnyob stream	Chhuzarkha	Lingzhi	27.875449	89.483561	3882	0	No change	Pristine	0.8

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58	Chukarbu stream	Chhuzarkha	Lingzhi	27.874013	89.483013	3953	1	No change	Pristine	15
59	Boeza stream	Chhuzarkha	Lingzhi	27.873839	89.483365	3939	2	No change	Pristine	86
60	Langcheylum stream (bayza mainstream)	Chhuzarkha	Lingzhi	27.889481	89.476108	3684	0	No change	Pristine	197
61	Zhumo stream	Chhuzarkha	Lingzhi	27.896315	89.478647	3601	0	No change	Pristine	4
62	Gugola stream	Chhuzarkha	Lingzhi	27.917535	89.46433	4267	0	No change	Pristine	0.7
63	Dunglo stream	Chhuzarkha	Lingzhi	27.920531	89.46615	4213	1	No change	Pristine	8.6
64	Dunglo stream 2	Chhuzarkha	Lingzhi	27.920599	89.469078	4111	1	No change	Pristine	0.3
65	Lhajadraphu spring	Chhuzarkha	Lingzhi	27.922896	89.473861	4194	0	No change	Pristine	0.2
66	Jagaypasa stream	Chhuzarkha	Lingzhi	27.929215	89.480419	3896	5	No change	Pristine	111
67	Kashukandrel stream	Chhuzarkha	Lingzhi	27.923387	89.493513	3660	0	No change	Pristine	41
68	Kashukandrel mainstream	Chhuzarkha	Lingzhi	27.922199	89.495544	3626	0	No change	Pristine	196
69	Zimbu stream	Chhuzarkha	Lingzhi	27.912968	89.490872	3545	0	No idea	Pristine	1618
70	Keychedra stream	Chhuzarkha	Lingzhi	27.908089	89.488922	3581	0	No change	Pristine	28

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71	Thangkhamo spring	Chhuzarkha	Lingzhi	27.897154	89.479692	3615	0	No change	Pristine	0.5
72	Zamithang stream	Chagphu	Lingzhi	27.859385	89.43779	4033	0	No change	Normal	2.8
73	Denkar source	Chagphu	Lingzhi	27.861124	89.437387	4023	1	No change	Normal	0.25
74	Minsel stream	Chagphu	Lingzhi	27.863198	89.449053	3804	0	No change	Pristine	1.4
75	Chamdhona stream	Chagphu	Lingzhi	27.876267	89.453804	3737	0	No change	Pristine	15.8
76	Minsel near NITM office	Chagphu	Lingzhi	27.860028	89.443401	3892	0	No change	Normal	6
77	Dopchey main stream	Chagphu	Lingzhi	27.838604	89.431004	4048	0	No change	Pristine	103
78	Dopchey stream 1	Chagphu	Lingzhi	27.836134	89.43084	4057	2	No change	Normal	1.8
79	Dopchey stream 2	Chagphu	Lingzhi	27.831035	89.432723	4074	0	No change	Pristine	0.8
80	Dopchey stream 3	Chagphu	Lingzhi	27.829806	89.43337	4057	0	No change	Pristine	0.6
81	Dopchey spring	Chagphu	Lingzhi	27.820381	89.431605	4129	1	No change	Normal	0.09
82	Dopchey stream 4	Chagphu	Lingzhi	27.819444	89.432693	4132	0	No idea	Pristine	1.7
83	Dopchey stream 5	Chagphu	Lingzhi	27.815622	89.431798	4182	2	No change	Normal	3.4

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84	Dopchey stream 6	Chagphu	Lingzhi	27.81462	89.432142	4173	0	No change	Pristine	1.8
85	Dopchey stream 7	Chagphu	Lingzhi	27.832093	89.430725	4068	1	No change	Normal	1.8
86	Dopchey stream 8	Chagphu	Lingzhi	27.838024	89.430518	4050	0	No change	Normal	0.8
87	Kewphu stream 1	Chagphu	Lingzhi	27.815203	89.431341	4100	0	No change	Pristine	2
88	Kewphu stream 2	Chagphu	Lingzhi	27.812831	89.430999	4208	0	No change	Pristine	2.8
89	Kewphu stream 3	Chagphu	Lingzhi	27.812032	89.43096	4227	0	No change	Pristine	0.8
90	Kewphu stream 4	Chagphu	Lingzhi	27.810715	89.430927	4284	0	No change	Pristine	0.825
91	Kewphu stream 5	Chagphu	Lingzhi	27.806892	89.430992	4284	0	No change	Pristine	11
92	Kewphu stream 6	Chagphu	Lingzhi	27.789995	89.430897	4408	10	No change	Pristine	38
93	Kewphu spring	Chagphu	Lingzhi	27.778811	89.432296	4493	0	No change	Pristine	0.04
94	Kewphu spring 1	Chagphu	Lingzhi	27.811383	89.431666	4228	0	No change	Pristine	0.6
95	Kewphu stream 7	Chagphu	Lingzhi	27.8072	89.436962	4279	0	No change	Pristine	1.2

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96	Kewphu stream 8	Chagphu	Lingzhi	27.806922	89.432048	4283	0	No change	Pristine	1.4
97	Kewphu spring 2	Chagphu	Lingzhi	27.806017	89.432183	4284	0	No change	Pristine	0.9
98	Kewphu spring 3	Chagphu	Lingzhi	27.805343	89.432165	4293	0	No change	Pristine	0.4
99	Kewphu spring 4	Chagphu	Lingzhi	27.803002	89.432102	4311	0	No change	Pristine	0.3
100	Kewphu stream 9	Chagphu	Lingzhi	27.802613	89.432072	4316	0	No change	Pristine	1.9
101	Kewphu spring 5	Chagphu	Lingzhi	27.800092	89.432017	4335	0	No change	Pristine	0.5
102	Kewphu spring 6	Chagphu	Lingzhi	27.79826	89.432023	4362	0	No change	Pristine	0.4
103	Soe Imtart	Jomphu	Soe	27.723193	89.282245	3706	1	No change	Pristine	0.746
104	Soe Makhang	Jomphu	Soe	27.72495	89.283012	3716	1	No change	Pristine	0.441
105	Bameythangkha	Jangothang	Soe	27.794987	89.349458	4168	2	No change	Pristine	0.898
106	Chamtapsaghu	Damgochong	Soe	27.766556	89.329927	4108	1	No change	Normal	0.22
107	Chugizaa	Dotaapaithang	Soe	27.765551	89.32823	4134	2	No change	Pristine	0.46

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108	Lhajeygang	Jangothang	Soe	27.783423	89.340592	4130	2	No change	Pristine	1.558
109	Damgochung	Damgochong	Soe	27.766925	89.332328	4037	5	No change	Normal	1.42
110	Dogaylachu	Dotaapaithang	Soe	27.762441	89.326667	4032	2	No change	Pristine	0.139
111	Jishilumpa	Jomphu	Soe	27.751823	89.299116	3967	3	No change	Pristine	1.816
112	Jomolhari lhakhang source	Jomphu	Soe	27.780599	89.267278	4209	1	No change	Pristine	0.568
113	Nachukha	Dozoten	Soe	27.753275	89.309905	3971	3	No change	Pristine	0.169
114	Nachukha	Dozoten	Soe	27.753302	89.310086	3969	6	No change	Pristine	0.328
115	Chamtapsaghu	Damgochong	Soe	27.766618	89.330251	4084	7	No change	Normal	0.62
116	Chamtapsa	Damgochong	Soe	27.766147	89.330848	4040	7	No change	Normal	1.7
117	Youngtey	Damgochong	Soe	27.763825	89.33782	4045	0	No change	Pristine	2.023
118	Tsedolum	Dotaapaithang	Soe	27.765356	89.328865	4100	0	No change	Pristine	0.058
119	Chugizaa	Dotaapaithang	Soe	27.765563	89.328141	4134	0	No change	Pristine	0.42

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120	Damitenkha	Dotaapaithang	Soe	27.767253	89.326112	4246	2	No change	Pristine	0.16
121	Damizanghu	Dotaapaithang	Soe	27.766873	89.325332	4251	1	No change	Pristine	0.152
122	Zhoedheychughu	Dotaapaithang	Soe	27.767689	89.324793	4290	3	No change	Pristine	0.34
123	Lheydizakha	Dotaapaithang	Soe	27.765941	89.321183	4297	4	No change	Pristine	0.13
124	Garatenchu	Dotaapaithang	Soe	27.763959	89.326487	4122	0	No change	Pristine	0.066
125	Dogaylachu	Dotaapaithang	Soe	27.76284	89.326573	4052	0	No change	Pristine	0.794
126	Dotabithanghuchu	Dotaapaithang	Soe	27.760163	89.323649	4043	0	No change	Pristine	0.183
127	Labutshochhu	Dotaapaithang	Soe	27.759859	89.318527	4091	0	No change	Pristine	32.292
128	Jangthochugue	Jangothang	Soe	27.783807	89.340136	4141	2	No change	Pristine	0.505
129	Lhaliphuchhu	Jangothang	Soe	27.783804	89.337416	4097	0	No change	Pristine	354.2
130	Jichudrakechhu	Jangothang	Soe	27.795637	89.349753	4170	0	No change	Pristine	291.984
131	Aum zam's watersource	Jangothang	Soe	27.793429	89.349796	4147	1	No change	Pristine	1.926

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132	Yameylungchu	Jangothang	Soe	27.786243	89.348603	4092	1	No change	Pristine	0.372
133	Upper Tshophu	Jangothang	Soe	27.761206	89.370445	4382	0	No change	Pristine	0
134	LowerTshophu	Jangothang	Soe	27.764305	89.37036	4372	0	No change	Pristine	0
135	Gunglungchhu	Jangothang	Soe	27.789384	89.353916	4281	0	No change	Pristine	76.421
136	Tshophu outlet	Jangothang	Soe	27.784053	89.347199	4077	0	No change	Pristine	62.93
137	Tsheytsho chhu	Damgochong	Soe	27.772321	89.337557	4028	0	No change	Pristine	0.288
138	Dagokoong chhu	Damgochong	Soe	27.771548	89.338651	3991	0	No change	Pristine	36.925
139	Dagokoong chhu (Spring)	Damgochong	Soe	27.771204	89.338463	3994	0	No change	Pristine	0.996
140	Nachukha	Dozoten	Soe	27.753236	89.309766	3977	0	No change	Pristine	0.111
141	Manilakha	Jomphu	Soe	27.751186	89.289105	4237	3	Drying	Pristine	0.097
142	Dzongthang	Jomphu	Soe	27.75639	89.277389	4004	0	No change	Pristine	26.344
143	Dzongthang chu	Jomphu	Soe	27.761124	89.269735	4039	2	No change	Pristine	26.634
144	Jomolatsho	Jomphu	Soe	27.784539	89.264963	4323	0	No change	Pristine	40.92

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145	Jomolhari Glacial flow	Jomphu	Soe	27.784956	89.264497	4319	0	No change	Pristine	61.41
146	Jomolhari glacial outflow	Jomphu	Soe	27.78373	89.263226	4315	0	No change	Pristine	80.73
147	Tsherim latsho	Jomphu	Soe	27.779221	89.264545	4205	0	No change	Pristine	11.147
148	Jumphu ju	Jomphu	Soe	27.745243	89.297113	3846	0	No change	Pristine	0.093
149	Hesithangkha chu	Jomphu	Soe	27.731677	89.283141	3750	0	No change	Pristine	0.798
150	Chen Chen Zam chu	Jomphu	Soe	27.727882	89.282691	3727	0	No change	Pristine	120.201
151	Below Chen chen zam	Jomphu	Soe	27.72711	89.283142	3706	0	No change	Pristine	0.147
152	Soe Makhang	Jomphu	Soe	27.724489	89.282577	3720	1	No change	Pristine	0.221
153	Next to Soe Imtart	Jomphu	Soe	27.72255	89.282111	3710	0	No change	Pristine	0.593
154	Below Soe Imtart	Jomphu	Soe	27.722197	89.282153	3694	0	No change	Pristine	0.615
155	Gelu	Barshong Nango	Naro	27.699524	89.592351	3865	6	No change	Normal	10.065
156	Gungkha	Barshong Nango	Naro	27.693783	89.614418	3960	1	Drying	Degraded	0.017
157	Thangkana	Barshong Nango	Naro	27.698178	89.610421	3931	45	No change	Normal	56.862

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158	Yulsa	Barshong Nango	Naro	27.687477	89.602205	3648	10	Drying	Normal	0.109
159	Gungkha Zachu	Barshong Nango	Naro	27.693768	89.612646	3974	1	Drying	Normal	0.069
160	Gungkha Wom	Barshong Nango	Naro	27.693554	89.61379	3947	23	No change	Normal	0.526
161	Chanda Nangsa chu	Barshong Nango	Naro	27.692787	89.60252	3726	1	No change	Normal	0.403
162	Saydochusa	Mentsiphu	Naro	27.747781	89.504364	4120	2	No change	Normal	25.643
163	Janguchu	Mentsiphu	Naro	27.74787	89.506271	4120	2	No change	Normal	12.893
164	Janguchu Wom	Mentsiphu	Naro	27.746032	89.507189	4103	2	No change	Normal	0.31
165	Mentsithang Gongma	Mentsiphu	Naro	27.744166	89.506597	4089	2	No change	Pristine	1.074
166	Riburichu	Mentsiphu	Naro	27.739721	89.51073	4099	2	No change	Normal	5.69
167	Mentsithang Wom	Mentsiphu	Naro	27.737489	89.510277	4052	2	No change	Normal	1.475
168	Mentsithangju	Mentsiphu	Naro	27.735617	89.512086	4041	2	No change	Normal	18.54
169	Chimkhanamtim Chu	Mentsiphu	Naro	27.731113	89.515863	4000	0	No change	Pristine	1.829
170	Mentsithangju 1	Mentsiphu	Naro	27.732699	89.514146	4015	0	No change	Pristine	1.012

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171	Lhakhanggu chu	Mentsiphu	Naro	27.738651	89.495257	4346	2	No change	Pristine	1.986
172	Chugaphu Chu	Mentsiphu	Naro	27.736466	89.494758	4323	1	No change	Normal	0.745
173	Jarkarpay Chu	Mentsiphu	Naro	27.717752	89.482173	4298	2	No idea	Pristine	0.416
174	Zhodhu Thungchu	Barshong Nango	Naro	27.713056	89.470382	4077	1	No idea	Normal	0.179
175	Woleythang chu	Zhomthang	Naro	27.691457	89.458048	4152	1	No change	Pristine	30.54
176	Woleythang Wom	Zhomthang	Naro	27.701614	89.461724	4114	1	No idea	Pristine	0.766
177	Zhoduju	Zhomthang	Naro	27.71117	89.47277	3927	1	No idea	Pristine	0.132
178	Sipchu	Zhomthang	Naro	27.709866	89.479549	3918	3	No idea	Normal	18.38
179	Jakuthaythay Chu	Zhomthang	Naro	27.710381	89.48338	3917	0	No idea	Pristine	0.045
180	Chakadhabsa 1	Zhomthang	Naro	27.71168	89.50405	3772	0	No idea	Pristine	0.652
181	Chakadhabsa 2	Zhomthang	Naro	27.709872	89.515105	3706	0	No idea	Pristine	33.544
182	Chakadhabsa 3	Zhomthang	Naro	27.709817	89.525898	3662	0	No idea	Pristine	7.05
183	Chakadhabsa 4	Zhomthang	Naro	27.708534	89.541515	3658	0	No idea	Pristine	3.274
184	Chakadhabsa 5	Zhomthang	Naro	27.706188	89.545266	3608	0	No idea	Pristine	0.167
185	Zhomphu chu	Zhomthang	Naro	27.697992	89.554572	3583	0	No idea	Pristine	216.734
186	Chugudum	Barshong Nango	Naro	27.69177	89.562173	3688	0	No change	Pristine	4.594
187	Shawdhing 1	Pagoed	Naro	27.679682	89.54277	4046	0	No idea	Pristine	1.808
188	Shawdhing	Pagoed	Naro	27.672462	89.534921	4163	1	No change	Pristine	4.332

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189	Chundhulo Ju	Pagoed	Naro	27.687347	89.55176	3878	0	No idea	Pristine	0.246
190	Langaythang Chu	Barshong Nango	Naro	27.693497	89.569642	3523	0	No idea	Pristine	2.562
191	Chundhulochu	Barshong Nango	Naro	27.693235	89.572743	3541	0	No idea	Pristine	4.26
192	Luphugyentsa	Barshong Nango	Naro	27.693021	89.573833	3539	0	No idea	Pristine	7.45
193	Barshong 1	Barshong Nango	Naro	27.683468	89.621943	3552	0	No idea	Pristine	0.855
194	Barshong 2	Barshong Nango	Naro	27.683675	89.626274	3461	0	No idea	Pristine	2.368
195	Barshong 3	Barshong Nango	Naro	27.682271	89.641854	3417	0	No idea	Pristine	3.585
196	Barshong 4	Barshong Nango	Naro	27.679144	89.646469	3403	0	No idea	Pristine	34.549
197	Barshong 5	Barshong Nango	Naro	27.675134	89.649332	3508	0	No idea	Pristine	1.151
198	Barshong 6	Barshong Nango	Naro	27.673716	89.648948	3463	0	No idea	Pristine	0.608
199	Changgedha Phu 1	Zhomthang	Chang	27.450066	89.626716	2963	30	Drying	Degraded	0.076
200	Changgedha Phu2	Zhomthang	Chang	27.450075	89.626709	2965	0	Dried up	Degraded	0
201	Changgedha Phu 3	Zhomthang	Chang	27.448864	89.618866	3156	40	No idea	Degraded	0.111
202	Changgedha Phu 4	Zhomthang	Chang	27.450664	89.614927	3196	4	No idea	Normal	2.898
203	Changaphu Top	Hongtsho Tashigang	Chang	27.515626	89.71052	3353	10	No change	Normal	23.62
204	Dhokarpichu	Hongtsho Tashigang	Chang	27.48975	89.729332	2891	3	No change	Normal	0.263
205	Hanggyue Gonpa 1	Ramtogtog Tsangrina	Chang	27.441157	89.622999	3008	1	Drying	Normal	0.028
206	Hanggue Gonpa 2	Ramtogtog Tsangrina	Chang	27.441001	89.622804	3017	1	Drying	Normal	0.0443
207	Kebilum	Hongtsho Tashigang	Chang	27.503087	89.720766	3038	25	No idea	Normal	9.91

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208	Chortensapi Rongchu	Yoedselpang	Chang	27.46322	89.724754	2702	9	No change	Normal	40.3353
209	Living Water	Yoedselpang	Chang	27.45171	89.706338	2564	10	No change	Normal	3.94
210	Neykhang	Hongtsho Tashigang	Chang	27.501436	89.709144	3156	35	Drying	Degraded	8.82
211	Ngabirongchu	Gangchhe Talakha	Chang	27.392612	89.665628	2710	2000	No idea	Normal	111.401
212	Chakochu	Gangchhe Talakha	Chang	27.379374	89.665273	2933	140	No change	Normal	17.436
213	Pangbom	Hongtsho Tashigang	Chang	27.50543	89.710887	3153	60	No idea	Degraded	8.0541
214	Phendeykha Chhu	Hongtsho Tashigang	Chang	27.490005	89.713498	3045	32	No change	Degraded	1.378
215	Shana Lum	Hongtsho Tashigang	Chang	27.490393	89.72976	2898	15	No idea	Degraded	9.773
216	Shaphu	Hongtsho Tashigang	Chang	27.497073	89.724391	2979	3	No change	Degraded	3.256
217	Shelkar Drupchu	Hongtsho Tashigang	Chang	27.468147	89.73612	3128	3	No change	Degraded	0.062
218	Toktophu chu 1	Ramtogtog Tsangrina	Chang	27.425037	89.618617	2395	1	No change	Pristine	0.0515
219	Toktophu chu 2	Ramtogtog Tsangrina	Chang	27.429212	89.619705	2449	200	Drying	Pristine	2.76
220	Trashigang Goenpa	Hongtsho Tashigang	Chang	27.463444	89.758644	3384	18	Drying	Degraded	0.172
221	Tsangrana chu	Ramtogtog Tsangrina	Chang	27.415894	89.625372	2269	15	Drying	Normal	0.597
222	Pang Neybu	Zhomthang	Chang	27.452167	89.611241	3268	38	No idea	Degraded	1.368

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223	Tachhu	Zhomthang	Chang	27.451805	89.608597	3302	20	No idea	Degraded	0.77
224	Gyepbkabiju	Zhomthang	Chang	27.455658	89.601158	3048	80	No change	Degraded	0.808
225	Sagonawom	Zhomthang	Chang	27.45584	89.601105	3240	35	No idea	Normal	0.61
226	Chortensapichu 2	Yoedselpang	Chang	27.463324	89.72343	2727	9	No change	Normal	3.775
227	Yusiphu	Yoedselpang	Chang	27.479234	89.696259	3032	150	Drying	Degraded	17.07
228	Helaylachhu	Chamgang Toed	Chang	27.430598	89.740858	3031	0	Drying	Pristine	23.9
229	Omtalho (Taktsekha 1)	Chamgang Toed	Chang	27.430855	89.726204	3114	0	No change	Pristine	0.23
230	Taktsechhu (Tauding)	Chamgang Toed	Chang	27.437533	89.724795	3091	0	Drying	Pristine	3.54
231	Phendeygu	Hongtsho Tashigang	Chang	27.488107	89.710359	3109	0	No idea	Pristine	1.6116
232	Trashigang Goenpa 2	Hongtsho Tashigang	Chang	27.461493	89.759111	3410	0	No idea	Pristine	0.011
233	Tshozhawju	Hongtsho Tashigang	Chang	27.481768	89.741842	2950	0	No idea	Pristine	2.44
234	Changaphu_2	Hongtsho Tashigang	Chang	27.506857	89.713937	3129	0	No change	Pristine	0.794
235	Daskilo	Yoedselpang	Chang	27.476823	89.715304	2899	0	No change	Pristine	0.2915
236	Yusiphu 2	Yoedselpang	Chang	27.477543	89.697594	2981	0	No idea	Pristine	0.298
237	Yusiphu 3	Yoedselpang	Chang	27.474471	89.695024	2965	0	No idea	Pristine	2
238	Yusiphu 4	Yoedselpang	Chang	27.47425	89.693621	2983	0	No idea	Pristine	2
239	Tsangrina	Ramtogtog Tsangrina	Chang	27.414629	89.630921	2411	64	Drying	Degraded	0.873

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240	Tshoringmo Zachu	Zhomthang	Chang	27.44641	89.604445	3496	1	No idea	Degraded	0.016
241	Tsangrigom	Zhomthang	Chang	27.44266	89.603878	3504	1	No change	Degraded	0.039
242	Sagona Chu	Zhomthang	Chang	27.455645	89.59578	3373	80	No change	Degraded	0.279
243	Yangchenphu chu	Changyokha Debsid	Chang	27.471752	89.652136	2484	12	No idea	Degraded	0.129
244	Motithang palace 1	Thimphu Throm	Chang	27.471767	89.600329	2748	150	No change	Normal	30.06
245	Motithang palace 2	Thimphu Throm	Chang	27.465671	89.599453	2925	4	Increased	Normal	16.57
246	Taktsekha 2	Chamgang Toed	Chang	27.432821	89.734096	3101	0	No change	Pristine	0.62
247	Tsenday Lumchhu	Chamgang Toed	Chang	27.431405	89.740017	3056	0	Drying	Pristine	0.76
248	Dheynachhu	Chamgang Toed	Chang	27.425334	89.736968	2999	0	Drying	Pristine	1.39
249	Tharana Gonpa 1	Hongtsho Tashigang	Kawang	27.503186	89.686877	3513	50	No idea	Normal	3.3
250	Tharana Gonpa 2	Hongtsho Tashigang	Kawang	27.504908	89.690782	3584	45	No idea	Normal	0.721
251	Tharana Gonpa 3	Hongtsho Tashigang	Kawang	27.504946	89.69076	3583	45	No idea	Normal	0.662
252	Begana	Boegarna Dodennang	Kawang	27.569183	89.633084	2647	1	Drying	Pristine	0.05
253	Chamina	Chhagminang Chhoekhor	Kawang	27.545923	89.686064	2817	40	Drying	Normal	25.8
254	Chamina (Confluence 1)	Chhagminang Chhoekhor	Kawang	27.538799	89.692707	2947	500	Drying	Degraded	11.77
255	Chamina (Confluence 2)	Chhagminang Chhoekhor	Kawang	27.538807	89.693153	2956	500	Drying	Degraded	19.47

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256	Chamina (Firing Range)	Chhagminang Chhoekhor	Kawang	27.552299	89.685468	2832	14	Drying	Pristine	9.821
257	Changtagang 1	Chhandagang Chhoekortse Phajoding	Kawang	27.556787	89.642152	2699	3	Drying	Normal	0.13
258	Changtagang 2	Chhandagang Chhoekortse Phajoding	Kawang	27.555775	89.643884	2706	65	Drying	Degraded	1.23
259	Changtagang 3	Chhandagang Chhoekortse Phajoding	Kawang	27.560651	89.630453	2939	65	Drying	Degraded	0.57
260	Chongna chu 1	Kuzhugchen	Kawang	27.554016	89.659435	2582	20	Drying	Pristine	1.559
261	Chongna chu 2	Kuzhugchen	Kawang	27.553471	89.65917	2547	2	Drying	Pristine	0.381
262	Dechenphu	Chhandagang Chhoekortse Phajoding	Kawang	27.542902	89.622301	2693	350	No idea	Degraded	58.9
263	Dekiling chu	Boegarna Dodennang	Kawang	27.565279	89.632729	2647	15	Drying	Normal	1.9
264	Gasacholing	Chhandagang Chhoekortse Phajoding	Kawang	27.556943	89.637204	2826	3	Drying	Pristine	0.54
265	Gentsawa 1	Boegarna Dodennang	Kawang	27.479138	89.596313	2793	1	Drying	Normal	0.445
266	Gyenju	Chhagminang Chhoekhor	Kawang	27.478585	89.595216	2786	5000	Drying	Degraded	42.99

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267	Hoding chu	Boegarna Dodennang	Kawang	27.562648	89.634792	2634	8	Drying	Normal	4.24
268	Hoding jab	Boegarna Dodennang	Kawang	27.562767	89.63793	2650	25	Drying	Degraded	0.83
269	Kushuchen chu 1 (Dozam chu)	Kuzhugchen	Kawang	27.563991	89.662176	2641	160	Drying	Degraded	19.32
270	Langjophakha 1	Boegarna Dodennang	Kawang	27.491039	89.651646	2532	70	Drying	Degraded	2.803
271	Langjophakha 2	Boegarna Dodennang	Kawang	27.491452	89.651659	2547	70	Drying	Degraded	0.669
272	Lemjathang	Dashi Zhoshuel	Kawang	27.540295	89.67392	2708	200	Drying	Degraded	13.15
273	Menchu Karp	Chhagminang Chhoekhor	Kawang	27.544818	89.666286	2557	1	Drying	Pristine	0.07
274	Motithang 2	Boegarna Dodennang	Kawang	27.483835	89.602251	2729	15	Drying	Degraded	0.854
275	Nimashong Rongchu	Boegarna Dodennang	Kawang	27.573107	89.619444	2706	8	Drying	Pristine	43.49
276	Samdrup gonpa	Boegarna Dodennang	Kawang	27.568735	89.627594	2836	1	Drying	Pristine	0.62
277	Samtenling	Boegarna Dodennang	Kawang	27.500801	89.609616	2553	800	Increased	Degraded	285.2
278	Taba rongchu	Chhandagang Chhoekortse Phajoding	Kawang	27.513491	89.659796	2599	400	Drying	Degraded	49.54

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279	Taba top	Boegarna Dodennang	Kawang	27.508227	89.655188	2592	71	Drying	Normal	11.853
280	Yangphel 1	Dashi Zhoshuel	Kawang	27.531666	89.68249	3056	1	Drying	Degraded	0.99
281	Yangphel 2	Dashi Zhoshuel	Kawang	27.5334	89.676112	2968	1	Drying	Pristine	0.25
282	Tharana new 1	Hongtsho Tashigang	Kawang	27.500702	89.685139	3486	0	No idea	Pristine	1.127
283	Tharana New 2	Hongtsho Tashigang	Kawang	27.500172	89.684971	3478	30	No idea	Pristine	0.54
284	Tharana New 3	Hongtsho Tashigang	Kawang	27.501512	89.685777	3489	25	No idea	Pristine	0.731
285	Tharana New 4	Hongtsho Tashigang	Kawang	27.505519	89.693859	3628	53	No idea	Normal	1.304
286	Tharana New 5	Hongtsho Tashigang	Kawang	27.505589	89.694434	3634	50	No idea	Normal	0.773
287	Barshong 7	Barshong Nango	Kawang	27.673538	89.648063	3473	0	No idea	Pristine	0.4
288	Chamina main confluence	Chhagminang Chhoekhor	Kawang	27.539066	89.692676	2970	500	No idea	Degraded	21.84
289	Chamina 3	Chhagminang Chhoekhor	Kawang	27.540908	89.691759	2943	0	No idea	Pristine	1.12
290	Gyalpozhing college top 1	Chhagminang Chhoekhor	Kawang	27.533007	89.668378	2915	0	No idea	Pristine	0.05
291	Gyalpozhing college top 3	Dashi Zhoshuel	Kawang	27.534356	89.669825	2908	1	No idea	Degraded	1.06
292	Dakalaypang chhu	Dashi Zhoshuel	Kawang	27.542914	89.65962	2491	50	No change	Degraded	3.96
293	Gyelsa Tewa chhu	Dashi Zhoshuel	Kawang	27.539012	89.659966	2610	30	No change	Normal	3.53
294	Choekhor mani chhu	Dashi Zhoshuel	Kawang	27.538754	89.656738	2501	60	No change	Degraded	2.35

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295	Soray cha chhu	Dashi Zhoshuel	Kawang	27.52876	89.65395	2648	15	No change	Normal	0.88
296	Zhakzhu goenpa chhu	Dashi Zhoshuel	Kawang	27.537536	89.654106	2467	0	No change	Pristine	0.23
297	Jana zam chu	Boegarna Dodennang	Kawang	27.573236	89.635164	2543	2	Drying	Pristine	0.15
298	Begana Guru Drupchu	Chhandagang Chhoekortse Phajoding	Kawang	27.568	89.636963	2494	1	No change	Normal	0.009
299	Samdrup gonpa 2	Chhandagang Chhoekortse Phajoding	Kawang	27.569653	89.628489	2798	0	No idea	Pristine	0.24
300	Nimashong Jana Zam	Boegarna Dodennang	Kawang	27.574793	89.628546	2595	10	No change	Pristine	3.26
301	Tsendagang BPC/springwater factory	Boegarna Dodennang	Kawang	27.571628	89.64298	2606	31	No change	Normal	6.27
302	Pure Bhutan mineral water	Boegarna Dodennang	Kawang	27.570923	89.641119	2531	1	No change	Degraded	0.64
303	Dechenling chu	Chhandagang Chhoekortse Phajoding	Kawang	27.544264	89.641475	2555	1	No idea	Normal	0.1
304	Taba Drupchu	Dashi Zhoshuel	Kawang	27.522615	89.6458	2344	1	No idea	Normal	0.04
305	Tango gengi tsawa	Boegarna Dodennang	Kawang	27.590277	89.643437	2738	50	No change	Normal	25.19

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306	Biop soelchu	Boegarna Dodennang	Kawang	27.593751	89.638641	2928	1	No change	Normal	0.11
307	Dzongkha wohm 1	Boegarna Dodennang	Kawang	27.601615	89.646933	3239	1	Drying	Normal	0.912
308	Dzongkha wohm 2	Boegarna Dodennang	Kawang	27.601926	89.646309	3204	0	No idea	Pristine	0.528
309	Gyalsey soelchu 1	Boegarna Dodennang	Kawang	27.595853	89.641863	3083	1	No change	Normal	0.274
310	Gyalsey soelchu 2	Boegarna Dodennang	Kawang	27.59471	89.64179	3025	1	No change	Normal	0.539
311	Tango hostel	Boegarna Dodennang	Kawang	27.593752	89.642151	2941	1	No change	Normal	0.167
312	Gepthang chu	Boegarna Dodennang	Kawang	27.605922	89.629263	2676	30000	Drying	Degraded	2207
313	Kushuchen chu 2	Kuzhugchen	Kawang	27.563474	89.661943	2627	0	No change	Pristine	0.127
314	Kushuchen chu 3	Kuzhugchen	Kawang	27.562289	89.657993	2571	45	No change	Normal	0.255
315	Lhundrupling chu	Kuzhugchen	Kawang	27.564094	89.649291	2520	1	No change	Pristine	0.221
316	Wangkha wom menchu	Kuzhugchen	Kawang	27.555891	89.65452	2428	0	Drying	Pristine	0.086
317	Wangkha wom chu	Kuzhugchen	Kawang	27.555365	89.655809	2463	45	No change	Normal	0.367
318	Choekhor menchu	Chhagminang Chhoekhor	Kawang	27.549999	89.656218	2425	1	No change	Pristine	0.2

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319	Choekhor chu	Chhagminang Chhoekhor	Kawang	27.550308	89.65674	2429	1	No change	Normal	0.073
320	Chari base chu	Boegarna Dodennang	Kawang	27.593262	89.627692	2574	0	No idea	Pristine	774
321	Dodena chu	Boegarna Dodennang	Kawang	27.603232	89.629648	2656	0	No idea	Pristine	31.93
322	Gentsawa 2	Boegarna Dodennang	Kawang	27.478741	89.596738	2760	1	No change	Pristine	0.042
323	Motithang 3	Boegarna Dodennang	Kawang	27.483468	89.60248	2717	0	No idea	Pristine	0.059
324	Tshozhaw ju 1	Sisinang	Mewang	27.341883	89.596778	2717	70	Drying	Degraded	0.368
325	Jamilumchu	Danglo Namsaeling	Mewang	27.38771	89.62784	2535	300	Drying	Degraded	37.74
326	Josanang	Sisinang	Mewang	27.358346	89.605326	2658	0	Dried up	Pristine	0
327	Khariphu 1	Sisinang	Mewang	27.376074	89.53717	2617	85	Drying	Degraded	0.926
328	Ngedrup Jazhi water source	Khasadrapchu	Mewang	27.384132	89.581775	2226	24	Drying	Normal	0.408
329	Sisilum 2	Sisinang	Mewang	27.355036	89.611683	2730	280	Drying	Degraded	19.36
330	Tshaphu 1	Khasadrapchu	Mewang	27.375361	89.591414	2599	60	Drying	Normal	1.147
331	Waluna	Tshaloongna	Mewang	27.459151	89.532169	2739	8	No change	Pristine	31.79
332	Tsiko rangeland 1	Tshaloongna	Mewang	27.489293	89.522467	3316	1	Drying	Pristine	0.001
333	Tsiko rangeland 2	Tshaloongna	Mewang	27.490798	89.522688	3407	1	Drying	Pristine	0.002
334	Tsiko rangeland 3	Tshaloongna	Mewang	27.4899	89.522952	3357	1	Drying	Pristine	0.003

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335	Dolulum chu	Tshaloongna	Mewang	27.485682	89.525124	3100	360	No change	Degraded	9.71
336	Damnaha chu 1	Tshaloongna	Mewang	27.472345	89.532567	2907	20	No change	Normal	10.32
337	Damna pang chu	Tshaloongna	Mewang	27.47151	89.529481	2850	20	No change	Normal	1.6
338	Damnaha chu 2	Tshaloongna	Mewang	27.471769	89.532671	2892	20	No change	Normal	8.54
339	Labana chu	Tshaloongna	Mewang	27.470453	89.53077	2871	60	No change	Normal	1.14
340	Mephutse chu	Tshaloongna	Mewang	27.469806	89.529859	2859	60	No change	Normal	0.48
341	Doebum chhu	Tshaloongna	Mewang	27.467868	89.526637	2805	60	No change	Normal	0.108
342	Jangchulum	Tshaloongna	Mewang	27.456915	89.532892	2797	0	No change	Pristine	3.6
343	Barachhu spring	Tshaloongna	Mewang	27.45522	89.530319	2775	18	Drying	Normal	0.38
344	Rabdo zampa Drupchu	Tshaloongna	Mewang	27.458479	89.523263	2614	8	No change	Normal	1.96
345	Gidaphu chu	Jiminang	Mewang	27.396782	89.55364	2630	250	No change	Degraded	2.56
346	Gidaphakha 1	Jiminang	Mewang	27.410185	89.563516	2338	27	Drying	Degraded	0.07
347	Gidaphakha 2	Jiminang	Mewang	27.408703	89.564021	2324	27	Drying	Degraded	0.06
348	Domtsang ngye spring water	Jiminang	Mewang	27.433221	89.538689	2438	570	No change	Degraded	90.125

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349	Bigolumpa chu 1	Tshaloongna	Mewang	27.469615	89.492788	3168	11	No change	Pristine	1.47
350	Bigolumpa chu 2	Tshaloongna	Mewang	27.46956	89.492009	3180	11	No change	Pristine	3.69
351	Bigolumpa chu 3	Tshaloongna	Mewang	27.46906	89.491448	3174	11	Drying	Pristine	0.14
352	Ronko camp 1	Tshaloongna	Mewang	27.464382	89.488137	3213	11	Drying	Pristine	0.8
353	Ronko camp 2	Tshaloongna	Mewang	27.46297	89.487655	3203	11	No change	Pristine	0.268
354	Ronko camp 3	Tshaloongna	Mewang	27.462759	89.489121	3204	0	No idea	Pristine	0.881
355	Ronko camp 4	Tshaloongna	Mewang	27.461737	89.490324	3194	0	Drying	Pristine	0.184
356	Ronko camp 5	Tshaloongna	Mewang	27.461193	89.49092	3186	0	Drying	Pristine	0.131
357	Bjela 1	Tshaloongna	Mewang	27.458681	89.493196	3175	0	No change	Pristine	1.69
358	Bjela 2	Tshaloongna	Mewang	27.457283	89.494072	3176	0	Drying	Pristine	0.453
359	Bjela 3	Tshaloongna	Mewang	27.448437	89.496519	3228	47	No change	Normal	2.415
360	Jela Dzong 2	Tshaloongna	Mewang	27.446078	89.484323	3506	1	Drying	Pristine	0.033
361	Chimithangka Drupchu	Tshaloongna	Mewang	27.443963	89.525509	2542	1	No change	Pristine	0.043
362	Khandrom ngye chu 1	Jiminang	Mewang	27.441577	89.537944	2718	200	No change	Degraded	0.239
363	Khandrom ngye chu 2	Jiminang	Mewang	27.442777	89.534476	2657	13	No change	Normal	0.251

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364	Bhutan Institute of well-being	Jiminang	Mewang	27.444372	89.52969	2584	1	No change	Normal	0.689
365	Domtsang ngye	Jiminang	Mewang	27.42999	89.534347	2646	7	No change	Normal	0.84
366	Tsaluna ngye 1	Tshaloongna	Mewang	27.495202	89.510982	3124	1	Drying	Pristine	0.426
367	Tsaluna ngye 2	Tshaloongna	Mewang	27.495096	89.510947	3099	0	No change	Pristine	1.47
368	Jigme rongchu	Tshaloongna	Mewang	27.494425	89.512523	3024	1200	No change	Degraded	387.4
369	Tsaluna ngye 3	Tshaloongna	Mewang	27.494054	89.512919	3003	0	No idea	Pristine	0.927
370	Tsaluna ngye 4	Tshaloongna	Mewang	27.488306	89.511676	2944	0	No change	Pristine	31.95
371	Tsaluna ngye 5	Tshaloongna	Mewang	27.485885	89.512146	2989	0	No idea	Pristine	1.586
372	Tsaluna ngye 6	Tshaloongna	Mewang	27.482258	89.515416	2907	0	No idea	Pristine	2.675
373	Kemgang 1	Tshaloongna	Mewang	27.478503	89.515756	2885	0	No idea	Pristine	1.107
374	Chukha dam	Tshaloongna	Mewang	27.470973	89.513755	2961	15	No idea	Normal	0.264
375	Maymay lumchu 1	Tshaloongna	Mewang	27.472079	89.510314	2980	15	No idea	Normal	0.574
376	Maymay lumchu 2	Tshaloongna	Mewang	27.472565	89.510013	2996	15	No idea	Normal	2.852
377	Za tsawa chu	Tshaloongna	Mewang	27.470687	89.517594	2839	0	No idea	Pristine	0.262
378	Dashithangka chu	Tshaloongna	Mewang	27.469897	89.517741	2839	8	No idea	Normal	0.47
379	Damkipang	Tshaloongna	Mewang	27.472115	89.518106	2839	0	Drying	Pristine	0.216
380	Sodogang chu	Tshaloongna	Mewang	27.465255	89.519222	2789	2	Drying	Pristine	0.351
381	Tashidingkha chu	Tshaloongna	Mewang	27.452091	89.522258	2602	2	Drying	Pristine	0.004

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382	Lamo Taba chu	Jiminang	Mewang	27.441747	89.522139	2588	13	No change	Normal	1.189
383	Kusoori chu	Jiminang	Mewang	27.441315	89.521054	2619	13	Drying	Normal	1.778
384	Chuchu chi	Jiminang	Mewang	27.441639	89.524541	2563	3	No idea	Pristine	0.376
385	Siliphu chu 1	Jiminang	Mewang	27.410709	89.532186	3046	33	Drying	Normal	5.692
386	Siliphu chu 2	Tshaloongna	Mewang	27.409511	89.534327	3021	24	Drying	Normal	1.85
387	Siliphu end	Tshaloongna	Mewang	27.407962	89.539986	2982	40	No idea	Degraded	3.976
388	Ja Karp 1	Jiminang	Mewang	27.439712	89.511943	2730	0	No idea	Pristine	1.077
389	Ja Karp rongchu	Jiminang	Mewang	27.439893	89.511899	2731	500	No change	Degraded	49.57
390	Ja Karp 2	Jiminang	Mewang	27.43929	89.512965	2729	29	No change	Normal	6.485
391	Patsakha chu	Jiminang	Mewang	27.438319	89.518256	2700	100	No idea	Degraded	6.126
392	Ziksalum chu	Jiminang	Mewang	27.438902	89.526097	2605	5	No change	Pristine	4.533
393	Nambarmo chu	Jiminang	Mewang	27.436605	89.532027	2555	2	Drying	Pristine	0.667
394	Chuzhidingkha chu	Jiminang	Mewang	27.441557	89.547914	2840	60	Drying	Degraded	6.006
395	Chuzhidingkha 2	Jiminang	Mewang	27.442773	89.547683	2857	61	Drying	Degraded	9.615
396	Zatalum chu 1	Jiminang	Mewang	27.430569	89.558476	2594	60	Drying	Degraded	1.429
397	Zatalum chu 2	Jiminang	Mewang	27.430888	89.558328	2598	61	Drying	Degraded	0.683
398	Pulina chu	Jiminang	Mewang	27.432605	89.577051	2775	26	Drying	Normal	7.808
399	Tsho zhaw ju 2	Sisinang	Mewang	27.340853	89.598606	2740	70	No change	Degraded	0.159

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400	Tsho zhaw ju 3	Sisinang	Mewang	27.340862	89.599039	2740	70	No change	Degraded	0.065
401	Chura lum chu 1	Sisinang	Mewang	27.34037	89.600192	2750	0	No idea	Pristine	0.099
402	Chura lum chu 2	Sisinang	Mewang	27.339959	89.601866	2814	70	Drying	Degraded	6.495
403	Menchulum	Sisinang	Mewang	27.341002	89.588977	2408	1	No change	Pristine	0.029
404	Padalum chu	Sisinang	Mewang	27.336489	89.590111	2465	15	Drying	Normal	1.266
405	Khariphu 2	Sisinang	Mewang	27.374327	89.541808	2536	0	No change	Pristine	1.373
406	Khariphu 3	Sisinang	Mewang	27.374712	89.541696	2550	85	No idea	Degraded	1.529
407	Khariphu 4	Sisinang	Mewang	27.374799	89.541642	2536	85	Drying	Degraded	2.829
408	Khariphu 5	Sisinang	Mewang	27.372981	89.546031	2461	85	No idea	Degraded	7.3
409	Sisilum 1	Sisinang	Mewang	27.355538	89.608465	2685	0	No idea	Pristine	0.327
410	Dozam chu	Khasadrapchu	Mewang	27.381155	89.595484	2335	53	Drying	Normal	3.111
411	Menchulum	Khasadrapchu	Mewang	27.381206	89.594737	2335	1	Drying	Pristine	0.048
412	Waluna chu	Danglo Namsaeling	Mewang	27.417278	89.595858	2435	43	Drying	Degraded	4.656
413	Jamilumchu 2	Danglo Namsaeling	Mewang	27.388129	89.628422	2537	81	Drying	Normal	9.01
414	Jigme Langtsho	Tshaloongna	Mewang	27.548643	89.506099	3836	0	Drying	Pristine	0
415	Jahay tsho	Tshaloongna	Mewang	27.531689	89.520333	3928	0	No idea	Pristine	0
416	Menthi	Dochhoeten Neyphu	Mewang	27.419585	89.498027	3640	1	No change	Pristine	0.356
417	Denchula	Gangchhe Talakha	Dagala	27.404551	89.680889	3180	8	No idea	Normal	0.927
418	Rechuthangka 1	Gangchhe Talakha	Dagala	27.398784	89.68461	3271	8	No idea	Normal	0.213

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419	Rechuthangka 2	Gangchhe Talakha	Dagala	27.398979	89.684509	3263	8	No idea	Normal	0.37
420	Baduzam 1	Chamgang Maed	Dagala	27.404418	89.701178	2809	45	No change	Degraded	7.213
421	Reshithangka 3	Chamgang Maed	Dagala	27.398502	89.692875	3124	3	No change	Normal	0.422
422	Bjishina	Chamgang Maed	Dagala	27.396934	89.695547	3085	4	No change	Normal	2.28
423	Dorona stream	Chamgang Maed	Dagala	27.39735	89.705023	2945	12000	No change	Degraded	32.132
424	Thanggom chhu	Chamgang Toed	Dagala	27.416559	89.707217	2792	2	Drying	Normal	0.09
425	Gandenlhayul chhu	Chamgang Maed	Dagala	27.393513	89.704219	2999	100	No change	Degraded	6.9
426	Lishina	Chamgang Toed	Dagala	27.412075	89.710612	2864	66	Drying	Degraded	2.07
427	Lumjangsa	Chamgang Toed	Dagala	27.410406	89.7308	2966	3333	No change	Degraded	4.54
428	Rebomsa 2 (Lushina New)	Chamgang Toed	Dagala	27.411557	89.713014	2945	400	Drying	Degraded	2.57
429	Rebomsa 1	Chamgang Toed	Dagala	27.411431	89.729979	2950	3333	No change	Degraded	27.39
430	Resaap	Chamgang Toed	Dagala	27.416725	89.735662	2926	3333	No change	Degraded	29.46
431	Reshithangka 4	Chamgang Maed	Dagala	27.392456	89.698918	3036	6	No change	Degraded	13.15
432	Jangochen	Chamgang Maed	Dagala	27.408621	89.704491	2880	0	No change	Pristine	0.25

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433	Talakha chhu	Chamgang Maed	Dagala	27.410514	89.684358	2948	0	No change	Pristine	0.773
434	Tsenamna Tam	Chamgang Maed	Dagala	27.398414	89.705482	2948	30	No change	Normal	1.093
435	Rishithangka 1 (earlier recorded as Tshokoding)	Chamgang Maed	Dagala	27.399357	89.684774	3248	15	No change	Degraded	0.456
436	Dhaychugiew	Chamgang Toed	Dagala	27.415845	89.717442	2913	66	No change	Degraded	0.65
437	Chamgang Menchhu	Chamgang Toed	Dagala	27.417134	89.710277	2746	350	No change	Degraded	0.16
438	Rishithangka 2 (earlier recorded as Tshokoding)	Chamgang Maed	Dagala	27.397651	89.685807	3288	17	No idea	Degraded	0.167
439	Aup Drubi pangchhu	Chamgang Maed	Dagala	27.394623	89.690166	3314	7	No change	Normal	0.725
440	Jangsa Tasabja chhu	Chamgang Maed	Dagala	27.404999	89.701117	2787	0	No change	Pristine	1.052
441	Baduzam 2 (Beside Guest house)	Chamgang Maed	Dagala	27.406263	89.701293	2782	0	No change	Pristine	0.324
442	Tshocheyphaka menchhu	Tshochhenkha Zamtog	Dagala	27.325015	89.671553	3089	15	Drying	Degraded	0.02
443	Bja marpbi chhu	Tshochhenkha Zamtog	Dagala	27.324498	89.668328	3027	0	No change	Normal	11.79
444	Pumo Tako lum	Tshochhenkha Zamtog	Dagala	27.323297	89.656315	2910	0	No idea	Pristine	0.473

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445	Kiptsi lum	Tshochhenkha Zamtog	Dagala	27.322657	89.65833	2932	0	No idea	Pristine	1.566
446	Damchhu Gogo	Tshochhenkha Zamtog	Dagala	27.323127	89.653269	2953	6	No idea	Normal	0.267
447	Singye Gensa Rongchhu	Wangdrog	Dagala	27.305104	89.642815	2933	215	No change	Degraded	86.05
448	Damtakha	Tshochhenkha Zamtog	Genekha	27.330423	89.649503	3177	11	No change	Degraded	1.769
449	Tabchulog chhu	Genyenkha	Genekha	27.320092	89.629979	2960	64	No change	Degraded	14.698
450	Chunyegang 1	Zhanglegkha	Genekha	27.317313	89.608064	3125	25	No idea	Degraded	0.466
451	Damgoma Lum 1	Chizhi	Genekha	27.325048	89.606852	3309	18	Drying	Degraded	0.763
452	Dorji Nye 2	Genyenkha	Genekha	27.336301	89.638259	3304	21	Drying	Degraded	1.213
453	Jangkho lum	Genyenkha	Genekha	27.31651	89.622013	3162	26	Drying	Degraded	1.507
454	Pholagangchhu	Wangbama	Genekha	27.293885	89.589715	2502	88	Drying	Degraded	36.98
455	Tazhi	Genyenkha	Genekha	27.313212	89.624719	3034	3	No change	Normal	0.369
456	Tongphu Gewa 1	Tshochhenkha Zamtog	Genekha	27.335867	89.651024	3269	7	No change	Normal	1.538
457	Lumathangka	Tshochhenkha Zamtog	Genekha	27.330491	89.669448	3235	16	No change	Degraded	1.428
458	Jaritsey chhu	Wangbama	Genekha	27.293825	89.597626	2501	65	No change	Degraded	6.83
459	Jozhigang	Wangbama	Genekha	27.31793	89.573633	2337	0	Increased	Pristine	0.214

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460	Dangomlum 2	Zhanglegkha	Genekha	27.324691	89.606574	3317	12	No idea	Degraded	0.299
461	Lang chhu	Zhanglegkha	Genekha	27.311424	89.604341	2781	12	No change	Degraded	0.629
462	Tsham chhu	Chizhi	Genekha	27.312899	89.597488	2800	7	No change	Degraded	0.027
463	Jowo chhu	Chizhi	Genekha	27.314539	89.597305	2837	25	Drying	Degraded	0.11
464	Chunyegang 2	Zhanglegkha	Genekha	27.315771	89.608655	3088	22	Drying	Degraded	1.735
465	Tshokhorthangka chhu	Zhanglegkha	Genekha	27.323507	89.607654	3412	15	No change	Degraded	0.378
466	Chhukisa	Zhanglegkha	Genekha	27.314348	89.614147	3336	6	Drying	Normal	0.09
467	Namchogang	Genyenkha	Genekha	27.314939	89.629393	2972	3	No idea	Normal	0.614
468	Zhadholum	Genyenkha	Genekha	27.313465	89.626687	2985	3	No idea	Normal	0.303
469	Dham Churum	Genyenkha	Genekha	27.313343	89.619187	3178	21	No change	Degraded	0.269
470	Azha Balatseri	Genyenkha	Genekha	27.315198	89.621238	3143	9	No idea	Degraded	0.305
471	Dorji Nye 2	Genyenkha	Genekha	27.335266	89.637023	3281	25	No change	Degraded	1.821
472	Ngachey Dhama	Genyenkha	Genekha	27.318498	89.629658	2957	0	No idea	Normal	0.265
473	Tongphu Gewa 2	Tshochhenkha Zamtog	Genekha	27.334238	89.650903	3233	0	No change	Pristine	0.187
474	Tamdazhi	Tshochhenkha Zamtog	Genekha	27.334711	89.652208	3223	0	No change	Pristine	0.365
475	Damphabi wo	Tshochhenkha Zamtog	Genekha	27.337147	89.655018	3316	0	No change	Pristine	0.373

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476	Chisa lum 1	Tshochhenkha Zamtog	Genekha	27.342671	89.657169	3362	0	No change	Pristine	0.795
477	Chisa lum 2	Tshochhenkha Zamtog	Genekha	27.344327	89.656992	3414	7	No idea	Normal	1.518
478	Wogola chhu	Tshochhenkha Zamtog	Genekha	27.344771	89.662679	3437	8	No change	Normal	5.5
479	Tara	Tshochhenkha Zamtog	Genekha	27.328088	89.649008	3065	1	No idea	Degraded	0.433
480	Gelong Dratshe	Tshochhenkha Zamtog	Genekha	27.32777	89.648035	3053	1	No change	Degraded	0.116
481	Chubtachen	Tshochhenkha Zamtog	Genekha	27.325514	89.644457	2981	2	No change	Degraded	0.746
482	Dangu	Tshochhenkha Zamtog	Genekha	27.329279	89.643572	3176	2	Drying	Degraded	0.512
483	Drubtse	Tshochhenkha Zamtog	Genekha	27.325061	89.647612	2958	6	No change	Degraded	1.549
484	Chazhi nye	Tshochhenkha Zamtog	Genekha	27.322179	89.642862	2906	0	No idea	Normal	0.509
485	Jangkho tsawa	Tshochhenkha Zamtog	Genekha	27.324659	89.650263	2917	1	No change	Degraded	0.182
486	Boe zachhu	Genyenkha	Genekha	27.316583	89.638059	2822	15	No change	Normal	0.514
487	Phachu batsha chhu	Tshochhenkha Zamtog	Genekha	27.336937	89.665383	3276	8	Drying	Degraded	1.6

Sl.No.	Name of the water source	Chiwog	Gewog	Latitude	Longitude	Altitude (m)	HHs depending on water source (including institutions)	Status of the water source	Watershed class of the water source	Discharge (l/s)
488	Geney Rongchhu	Tshochhenkha Zamtog	Genekha	27.326165	89.671759	3050	350	No change	Degraded	215.1
489	Tshochekha	Tshochhenkha Zamtog	Genekha	27.326619	89.665432	3125	0	No change	Degraded	0.02
490	Baysa pang	Tshochhenkha Zamtog	Genekha	27.32595	89.654713	2992	1	Drying	Normal	0.061
491	Zhingchhu zhama	Tshochhenkha Zamtog	Genekha	27.327141	89.652035	3024	5	No change	Degraded	0.639
492	Zachu dongkha	Wangdrog	Genekha	27.298458	89.62027	2587	0	No change	Pristine	131.2
493	Damina lum chhu	Genyenkha	Genekha	27.297738	89.608812	2460	0	No idea	Pristine	32.8
494	Gene Rongchhu outflow	Wangbama	Genekha	27.321762	89.563875	2094	500	No change	Degraded	574.7
495	Heywakha	Genyenkha	Genekha	27.297708	89.60574	2455	0	No change	Pristine	10.21