

Therapeutic Effectiveness of Natural Hot Springs from the Perspective of Sowa-Rigpa Medicine

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Abstract

Natural hot springs (Chu-tsen) constitute one of the eighteen therapeutic modalities described in the traditional medical system of Sowa-Rigpa. In Ladakh, these geothermal springs have been utilized for therapeutic and health-promoting purposes for more than two millennia. According to Sowa-Rigpa literature and local traditional knowledge, natural hot springs are beneficial in the management of chronic disorders such as arthritis, paralysis associated with neurological conditions, musculoskeletal pain, joint stiffness, chronic gastrointestinal diseases, and various skin disorders. In addition to their therapeutic applications, hot springs are widely used for rejuvenation and the promotion of general well-being.

In recent years, the number of local residents and tourists visiting the hot springs of Ladakh has increased considerably due to growing awareness of traditional wellness practices and improved accessibility to remote regions. Sowa-Rigpa attributes the medicinal properties of these springs to their naturally occurring mineral constituents, including sulphur, shilajit, calcite, and other geo-mineral compounds, which are believed to restore physiological balance, alleviate disease, and promote longevity. Traditional practitioners have long regarded these springs as effective complementary therapies for chronic illnesses, and their continued use reflects the enduring relevance of indigenous medical knowledge in the Trans-Himalayan region.

Although Ladakh possesses numerous natural hot springs of considerable therapeutic importance, systematic scientific documentation integrating classical Sowa-Rigpa concepts with modern geological and hydrochemical investigations remains limited. This article presents an overview of the classification, traditional uses, and therapeutic significance of Ladakh's natural hot springs from the perspective of Sowa-Rigpa medicine, while highlighting the need for further multidisciplinary research.

Keywords: Sowa-Rigpa, Chu-tsen, Natural Hot Spring, Ladakh, Hydrotherapy, Sulphur, Calcite, Shilajit, rGyud-bZhi, Traditional Medicine

Introduction

Natural hot springs (*Chu-tsen*) constitute one of the eighteen principal therapeutic modalities described in Sowa-Rigpa, the traditional medical system of the Himalayan region. For more than two millennia, these geothermal springs have been used in Ladakh for the prevention, management, and rehabilitation of a wide range of chronic disorders. Traditional Sowa-Rigpa physicians (Amchis) have long prescribed therapeutic bathing in natural hot springs for the treatment of arthritis, paralysis associated with

neurological disorders, musculoskeletal pain, joint stiffness, chronic gastrointestinal diseases, skin disorders, and for the promotion of general health, longevity, and vitality.

The popularity of natural hot springs has increased considerably in recent decades. Every year, thousands of local residents and visitors travel to geothermal sites throughout Ladakh seeking therapeutic relief, preventive healthcare, and wellness experiences. This growing interest reflects the increasing recognition of traditional systems of medicine, improved accessibility to remote Himalayan regions, and the expanding role of wellness tourism.

According to the principles of Sowa-Rigpa, the therapeutic efficacy of natural hot springs (*Chu-tsen*) is attributed to their unique mineral composition and geothermal characteristics. Traditional Sowa-Rigpa literature classifies hot springs according to the predominance and combination of naturally occurring minerals associated with geothermal activity. In the traditional understanding, **coal is regarded as the principal geological material responsible for heating the spring water**, while associated minerals such as **calcite (Chong-shi)**, **sulphur (Muzi)**, **Shilajit (Brag-zhun)**, and **realgar (IDong-ros)** are believed to impart their distinctive medicinal properties. Accordingly, natural hot springs are traditionally recognized as occurring in combinations such as **coal with calcite (Chong-shi)**, **coal with sulphur (Muzi)**, **coal with Shilajit (Brag-zhun)**, **coal with calcite and sulphur (Chong-shi + Muzi)**, and **coal with sulphur, Shilajit, and realgar (Muzi + Brag-zhun + IDong-ros)**. These mineral combinations are believed to determine the therapeutic properties of each hot spring and their specific clinical applications.

From the Sowa-Rigpa perspective, the synergistic action of geothermal heat and naturally occurring minerals helps restore the balance of the three *Nyepa* (*rLung*, *mKhris-pa*, and *Bad-kan*), eliminate accumulated toxins, improve blood circulation, relieve pain and stiffness, enhance digestive and metabolic functions, and rejuvenate the body. Consequently, different types of hot springs are prescribed for different disease conditions according to their mineral composition and medicinal qualities.

Ladakh is endowed with more than twenty natural hot springs distributed across its valleys and river basins. These geothermal springs have been an integral part of the region's traditional healthcare system for centuries and continue to be widely used by local communities. Despite their long-standing therapeutic use and cultural significance, relatively few systematic studies have documented their geographical distribution, mineral characteristics, and therapeutic applications from the perspective of Sowa-Rigpa medicine. Most published reports focus primarily on geological or tourism-related aspects, leaving a significant gap in the documentation of traditional medical knowledge and its scientific evaluation. This article therefore aims to provide a comprehensive overview of the classification, traditional mineral characteristics, medicinal properties, therapeutic indications, and clinical applications of natural hot springs in Ladakh based on classical Sowa-Rigpa literature, indigenous knowledge, and contemporary practice.



(Puga Hot Spring)

The term *Chu-tsen* (ཆུ་མཚན།) literally means "**natural hot water**," where *Chu* denotes water or liquid and *Tsen* signifies heat or warmth comparable to fire. The concept has deep historical roots in the Himalayan civilization and occupies an important place in the classical medical text, the *rGyud-bZhi* (*The Four Medical Tantras*). The Root Tantra describes five categories of medicinal waters and five principal types of natural hot springs, each possessing distinct medicinal properties and therapeutic indications. Classical Sowa-Rigpa scholars further describe numerous subtypes of hot springs, emphasizing that their classification depends upon mineral composition, temperature, odour, geological formation, and surrounding ecological conditions.

The enduring use of *Chu-tsen* therapy illustrates the holistic philosophy of Sowa-Rigpa, in which the healing properties of natural resources are integrated with preventive medicine, therapeutic intervention, and health promotion. Systematic documentation of these geothermal resources, together with multidisciplinary investigations integrating traditional knowledge, geology, hydrochemistry, and clinical research, will contribute to a better understanding of their therapeutic potential and support the preservation of this important component of the Himalayan medical heritage.

According to Sowa-Rigpa, although numerous varieties of hot springs exist depending on their mineral composition and geographical characteristics, they are broadly classified into five principal categories:

1. **coal with calcite (Chong-shi)**
2. **coal with sulphur (Muzi)**
3. **coal with Shilajit (Brag-zhun)**
4. **coal with calcite and sulphur (Chong-shi + Muzi)**
5. **coal with sulphur, Shilajit, and realgar (Muzi + Brag-zhun + IDong-ros).**

Classical Sowa-Rigpa scholars further recognize numerous subtypes, with some texts describing as many as one hundred and one varieties of hot springs. Their classification depends upon mineral composition, temperature, smell, geological formation, and surrounding ecological conditions.

Traditional theory maintains that the emergence of natural hot springs is closely associated with subterranean geothermal activity and mineral-rich geological formations. The medicinal quality of a hot spring is determined not only by its mineral constituents but also by its characteristic odour, surrounding rock formations, soil composition, and the natural environment in which it originates.

Classification of Natural Hot Springs (*Chu-tsen*) and Their Traditional Therapeutic Applications According to Sowa-Rigpa

S. No.	Type of Hot Spring	Traditional Therapeutic Indications
1	Calcite Hot Spring (<i>Chong-shi</i>)	Traditionally indicated for gastritis, poisoning, and chronic heat (<i>mKhris-pa</i>) disorders.
2	Sulphur Hot Spring (<i>Muzi</i>)	Used for leprosy, vitiligo, chronic ulcers, malignant sores, skin diseases associated with <i>Chu-zer</i> , and certain forms of cancer.
3	Shilajit Hot Spring (<i>Brag-zhun</i>)	Recommended for arthritis, gout, gastritis, and urinary obstruction.
4	Calcite and Sulphur Hot Spring (<i>Chong-shi + Muzi</i>)	Beneficial for arthritis, gout, chronic heat disorders, indigestion, tumours, and certain internal malignancies.
5	Sulphur, Shilajit, and Realgar Hot Spring (<i>Muzi + Brag-zhun + lDong-ros</i>)	Traditionally prescribed for indigestion, enhancement of digestive metabolism (<i>Me-drod</i>), and the management of <i>Bad-kan lHen</i> and <i>Bad-kan Chag-dregs</i> disorders.

Therapeutic Applications of Natural Hot Spring (*Chu-tsen*) Therapy

The therapeutic properties and distinctive characteristics of natural hot springs (*Chu-tsen*) are primarily determined by their mineral composition and geothermal characteristics. According to Sowa-Rigpa, each type of hot spring possesses unique medicinal qualities and is prescribed for specific disease conditions. Consequently, the mineral composition of a hot spring serves as the principal criterion for its therapeutic application.

Among the different categories, Sulphur Hot Springs (*Muzi*) are traditionally indicated for the management of leprosy, vitiligo, chronic ulcers, malignant sores, skin disorders associated with *Chu-zer*, and certain forms of cancer. Calcite Hot Springs (*Chong-shi*) are prescribed for gastritis, poisoning, and chronic heat (*mKhris-pa*) disorders. Shilajit Hot Springs (*Brag-zhun*) are recommended for arthritis, gout, gastritis, and urinary obstruction. Calcite and Sulphur Hot Springs (*Chong-shi + Muzi*) are traditionally used for arthritis, gout, chronic heat disorders, indigestion, tumours, and selected internal malignancies. Likewise, Sulphur, Shilajit, and Realgar Hot Springs (*Muzi + Brag-zhun + lDong-ros*) are considered beneficial for enhancing digestive metabolism (*Me-drod*), relieving indigestion, and managing *Bad-kan lHen* and *Bad-kan Chag-dregs* disorders.

In addition to these disease-specific indications, classical Sowa-Rigpa texts describe *Chu-tsen* therapy as beneficial for a broad spectrum of chronic musculoskeletal, neurological, dermatological, and functional disorders. Therapeutic bathing is traditionally recommended for neurological conditions such as numbness, sciatica, peripheral neuropathy, and paralysis of the limbs; musculoskeletal disorders including arthritis, gout, upper, middle, and lower back pain, chronic spinal pain, joint stiffness, muscular tightness, ligament disorders, and neck and shoulder rigidity. It is also considered useful for

improving peripheral circulation, relieving plantar fasciitis (heel pain), softening rough and dry skin, reducing fatigue resulting from excessive physical exertion, alleviating mental exhaustion caused by excessive cognitive activity, and supporting healthy body weight management.

From the perspective of Sowa-Rigpa, the therapeutic action of natural hot springs extends beyond the treatment of individual diseases. Regular hot spring bathing is regarded as an important modality of preventive and restorative healthcare, helping to restore the balance of the three *Nyepa* (*rLung*, *mKhris-pa*, and *Bad-kan*), eliminate accumulated toxins, improve circulation and metabolic activity, relieve chronic pain and stiffness, enhance physical mobility, and strengthen the body's intrinsic healing capacity. Consequently, *Chu-tsen* therapy is traditionally employed not only for disease management but also for rejuvenation, health promotion, and the maintenance of longevity and overall well-being.

The therapeutic effectiveness of *Chu-tsen* therapy is traditionally considered to depend on the appropriate selection of the hot spring according to its mineral composition, the patient's constitutional type (*Nyepa*), the nature and stage of the disease, seasonal conditions, and the prescribed duration and frequency of bathing. Therefore, Sowa-Rigpa emphasizes that hot spring therapy should be administered under the guidance of a qualified Amchi to ensure its safe and effective use.



(Chumathang Hot Spring)

Contraindications of Natural Hot Spring Bath (*Chu-tsen*)

Although natural hot spring (*Chu-tsen*) therapy is widely recognized in Sowa-Rigpa for its therapeutic and rejuvenating benefits, it is not suitable for every individual or disease condition. Classical Sowa-Rigpa texts recommend that hot spring therapy should be avoided whenever excessive heat may aggravate the underlying pathological condition or adversely affect the patient's health.

Hot spring bathing is **contraindicated** in individuals suffering from acute fever, severe heat (*mKhris-pa*) disorders, generalized oedema (water retention), ascites, pregnancy, anorexia, uncontrolled hypertension,

diabetes mellitus, hepatitis, pneumonia, and other acute infectious or inflammatory diseases. In these conditions, exposure to hot spring water may aggravate symptoms or interfere with the body's natural healing process.

Treatment should also be discontinued immediately if adverse reactions develop during or after bathing. Such reactions include excessive dryness or cracking of the lips and tongue, worsening numbness, blurred vision, dizziness, abdominal pain, liver discomfort, excessive weakness, or any other unusual symptoms following bathing or ingestion of hot spring water. Furthermore, direct exposure of sensitive organs, particularly the eyes, to hot spring water should be avoided.

For safe and effective treatment, the selection of an appropriate hot spring, water temperature, duration and frequency of bathing should always be determined according to the patient's constitutional type (*Nyepa*), disease condition, age, physical strength, and seasonal factors under the supervision of a qualified Sowa-Rigpa physician (*Amchi*).

Indications and Contraindications of Natural Hot Spring (*Chu-tsen*) Therapy According to Sowa-Rigpa

Indications of Hot Spring (*Chu-tsen*) Contraindications / Precautions

Musculoskeletal and Neurological Disorders	Medical	Contraindications
- Stiffness and contracture of the limbs - Arthritis and gout - Paralysis and neurological disorders - Sciatica and numbness - Upper, middle, and lower back pain - Tight muscles, joints, and ligaments - Neck and shoulder rigidity - Curvature of the spine - Plantar fasciitis (heel pain)	- Acute heat (<i>mKhris-pa</i>) - Contagious and infectious diseases - Acute inflammatory conditions (water retention) - Generalized oedema - Diabetes mellitus - Uncontrolled hypertension - Hepatitis and pneumonia - Severe weakness and anorexia	- disorders - fever - diseases - conditions - retention) - Ascites - Pregnancy - mellitus - hypertension - pneumonia

Chronic Diseases

• Certain cancers (as described in Sowa-Rigpa)

Treatment

• Chronic inflammation of muscles and soft tissues

• Chronic and non-healing wounds with swelling symptoms

• Menstrual disorders

• Accumulation of *Chu-zer* in muscles and bones

• Avoid direct exposure of the eyes to hot spring water.

• Discontinue treatment if dizziness, blurred vision, abdominal discomfort, liver pain, excessive weakness, or other adverse symptoms occur.

• Seek medical advice before resuming therapy.

Precautions

General Health Benefits

• Improves peripheral circulation

• Relieves rough and dry skin

• Reduces musculoskeletal pain and

Unsuitable

• Summer

• Mid-winter (January–February)

Seasons

(May–August)

stiffness

- Promotes relaxation and rejuvenation
- Restores the balance of the three *Nyepa* (*rLung*, *mKhris-pa*, and *Bad-kan*)

Recommended	Seasons
• Spring	(March–April)
• Autumn	(October–November)
• Pre-winter	(November–December)

Seasonal Recommendations for Natural Hot Spring (*Chu-tsen*) Therapy

According to the principles of Sowa-Rigpa, the therapeutic efficacy of natural and artificial hot spring (*Chu-tsen*) therapy is influenced not only by the patient's constitutional type (*Nyepa*) and disease condition but also by seasonal variations. Appropriate selection of the treatment season is considered essential for maximizing therapeutic benefits while minimizing adverse effects.

Hot spring therapy is traditionally **recommended during the spring (March–April), autumn (October–November), and pre-winter (November–December)**. During these seasons, climatic conditions are considered relatively balanced, allowing the body to respond favourably to the warming effects of mineral-rich geothermal water. Consequently, these periods are regarded as the most suitable for the management of chronic musculoskeletal disorders, neurological diseases, digestive disturbances, and general rejuvenation.

Conversely, **hot spring therapy is generally discouraged during the summer (May–August) and mid-winter (January–February)**. From the Sowa-Rigpa perspective, excessive environmental heat during summer may aggravate *mKhris-pa* (heat) disorders, whereas the intense cold and freezing conditions of winter may reduce the body's tolerance to thermal therapy and increase susceptibility to adverse reactions. Therefore, treatment during these seasons should be undertaken only when specifically indicated and under the supervision of a qualified Sowa-Rigpa physician.

In summary, the successful application of *Chu-tsen* therapy depends upon careful consideration of the patient's constitutional type (*Nyepa*), disease stage, age, physical strength, mineral characteristics of the hot spring, bathing protocol, and seasonal conditions. Adherence to these principles ensures the safe and effective use of hot spring therapy while preserving its traditional therapeutic value within the Sowa-Rigpa system of medicine.

Procedure for Therapeutic Hot Spring (*Chu-tsen*) Bath

According to the Sowa-Rigpa tradition, hot spring (*Chu-tsen*) therapy should be performed in a systematic manner to ensure its maximum therapeutic benefit and to minimize adverse effects. The procedure encompasses spiritual preparation, gradual adaptation to the hot spring, appropriate bathing frequency, and adherence to dietary and lifestyle recommendations throughout the treatment period.

1. Traditional Preparatory Rituals

Traditionally, before entering a natural hot spring, individuals recite sacred mantras and perform ritual offerings (*gtor-ma*) to pay respect to the local water spirits (*klu*), territorial deities (*yul-lha*), and other protective deities believed to inhabit the surrounding environment. The *gtor-ma*, prepared from butter, roasted barley flour, natural colours, and other ritual ingredients, is offered as a gesture of gratitude and

to seek protection, harmony, and successful healing. These rituals reflect the holistic philosophy of Sowa-Rigpa, which emphasizes the interrelationship between human health, nature, and spiritual well-being.

2. Initial Bathing Procedure

For first-time users, Sowa-Rigpa advises against prolonged immersion or bathing in excessively hot water. Instead, the body should gradually adapt to the thermal effects of the hot spring. Initially, the individual should immerse only the feet and gradually wet the limbs using lukewarm or moderately warm water for a short duration. As tolerance increases, the bathing temperature and duration may be progressively increased over subsequent sessions. Gentle cleansing of the body and massage of the affected areas are recommended to enhance circulation, relieve pain, and facilitate the therapeutic action of the mineral-rich water.

3. Recommended Bathing Schedule

For a **one-week therapeutic course**, Sowa-Rigpa recommends a gradual increase and subsequent decrease in the frequency of bathing as follows:

Day Recommended Number of Baths

Day 1 Once

Day 2 Twice

Day 3 Three times

Day 4 Four times

Day 5 Three times

Day 6 Twice

Day 7 Once

This ascending and descending sequence allows the body to adapt gradually to the therapeutic effects of the hot spring while avoiding excessive strain.

For a **two-week treatment course**, the bathing frequency should increase progressively during the first week, reaching the maximum number of sessions in the middle of the treatment, and then gradually decrease during the second week. This schedule is traditionally believed to optimize therapeutic outcomes while maintaining the body's physiological balance.

4. Massage and Local Application

During immersion, gentle rubbing and massage of the affected body parts are encouraged. Particular attention is given to painful joints, stiff muscles, and diseased areas to improve local circulation, reduce pain, alleviate stiffness, and enhance the absorption of the therapeutic effects of the mineral-rich water.

5. Internal Use of Hot Spring Water

Certain classical Sowa-Rigpa texts also describe the cautious internal administration of small quantities of specific hot spring water for selected conditions, including internal tumors, metabolic disorders, and certain chronic gastrointestinal diseases. However, this practice should only be undertaken under the direct supervision of a qualified Sowa-Rigpa physician (Amchi), as the chemical composition and safety of individual hot springs may vary considerably.

6. Dietary and Lifestyle Recommendations

Throughout the treatment period, patients are advised to follow appropriate dietary and lifestyle measures. They should wear warm clothing after bathing to prevent exposure to cold, consume easily digestible and nutritious foods, maintain adequate rest, and avoid strenuous physical activity

immediately after bathing. Excessive exposure to cold wind, alcohol consumption, heavy meals, and incompatible dietary habits should be avoided, as these may diminish the therapeutic benefits of the treatment.

By following these procedural guidelines, hot spring (Chu-tsen) therapy is believed to promote recovery from chronic diseases, restore the balance of the three *Nyepa* (rLung, mKhris-pa, and Bad-kan), improve circulation, relieve pain and stiffness, and enhance overall health and vitality according to the principles of Sowa-Rigpa medicine.



(Kanji Spring water)

Natural Hot Springs (Chu-tsen) in Ladakh

Ladakh, located in the Trans-Himalayan region of northern India, is renowned not only for its spectacular landscapes but also for its abundant geothermal resources. Situated at an average elevation exceeding 3,000 m above sea level, the region is characterized by rugged mountains, high-altitude plateaus, and deep river valleys. Owing to its unique geological setting within the Himalayan geothermal belt, Ladakh possesses significant geothermal potential, giving rise to numerous natural hot springs (*Chu-tsen*) distributed across different valleys.

For centuries, the people of Ladakh have utilized these mineral-rich hot springs for therapeutic bathing, personal hygiene, detoxification, and rejuvenation. According to the principles of Sowa-Rigpa medicine, the medicinal properties of hot springs arise from their geothermal heat and naturally occurring minerals, which are believed to restore the balance of the three *Nyepa* (rLung, mKhris-pa, and Bad-kan), alleviate chronic diseases, and promote overall health.

More than twenty natural hot springs have been documented in approximately eight major locations in Ladakh, including **Demchok, Panamik, Chumathang, Puga, Wanla, Chilling, Skyu-Kaya, and Hankar**. Among these, **Demchok, Panamik, and Chumathang** are the best known for their therapeutic

value and attract hundreds of local residents and thousands of tourists each year seeking relief from chronic ailments and wellness benefits.

Hot Spring (Chu-tsen) in Demchok

Demchok village is situated near the Indo-China border in southeastern Ladakh at an elevation of approximately **4,210 m above sea level**. The surrounding alluvial plains support limited agriculture and grazing. Demchok is renowned for its numerous geothermal springs, with local tradition identifying more than ten distinct springs possessing different mineral compositions and therapeutic properties.

According to Sowa-Rigpa practitioners and local experience, individual springs are indicated for specific conditions, including arthritis, digestive disorders, skin diseases, neurological disorders, kidney ailments associated with cold disorders, gout, and certain forms of cancer. The springs have long been regarded as valuable complementary therapies for chronic illnesses and rehabilitation.

Hot Spring (Chu-tsen) in Chumathang

Chumathang is located approximately **138 km southeast of Leh** in the Changthang region at an elevation of about **3,950 m above sea level**. It is one of the most visited geothermal sites in Ladakh due to its accessible hot springs and established bathing facilities.

The mineral-rich waters are traditionally used for the management of arthritis, gout, chronic heat disorders, neurological diseases, skin disorders, and leprosy. Both local inhabitants and visitors have reported symptomatic relief following therapeutic bathing, making Chumathang one of the most important traditional wellness destinations in Ladakh.

Hot Spring (Chu-tsen) in Panamik

Panamik is situated in the Nubra Valley, approximately **150 km north of Leh**, and lies at an elevation of about **3,180 m above sea level**.

The village is famous for its naturally occurring hot springs, which have been used traditionally for treating neurological disorders, arthritis, gout, chronic heat disorders, musculoskeletal pain, and gastrointestinal diseases. The site attracts numerous domestic and international tourists every year seeking both therapeutic and recreational experiences.

Hot Spring (Chu-tsen) in Puga

Puga is located in the Changthang region approximately **176 km from Leh** at an elevation of around **4,400 m above sea level**. It is one of the most significant geothermal fields in India and is characterized by hot springs, fumaroles, mud pools, and sulphur deposits.

According to Sowa-Rigpa, the mineral-rich hot springs of Puga are beneficial for vitiligo, chronic and non-healing wounds, elephantiasis, arthritis, digestive disorders, muscular contractures, and stiffness of the limbs. The geothermal field has also attracted scientific interest because of its substantial geothermal energy potential.

Hot Spring (Chu-tsen) in Wanla

Wanla village is located in Khaltse Block on the banks of the Yapola River, approximately **114 km from Leh**, at an elevation of about **3,186 m above sea level**.

The local hot springs are traditionally indicated for arthritis, chronic neurological disorders, lower back pain, muscular stiffness, joint contractures, and chronic rheumatic diseases. The springs continue to be used by local residents as part of traditional healthcare practices.

Hot Spring (Chu-tsen) in Chilling Sumda

Chilling Sumda is situated along the Zanskar River at an elevation of approximately **3,195 m above sea level**.

The hot springs found in this area are traditionally used for joint pain, arthritis, cold disorders, urinary disorders, gonorrhoea, and kidney diseases associated with impaired urinary function. These springs remain important therapeutic resources for surrounding communities.

Hot Spring (Chu-tsen) in Skyu-Kaya

Skyu-Kaya is located in the Markha Valley at an elevation of approximately **3,500 m above sea level**.

Natural hot springs in this village have traditionally been used for the treatment of arthritis, chronic skin diseases, musculoskeletal pain, and joint stiffness. Local communities continue to value these springs for their perceived therapeutic and rejuvenating effects.

Hot Spring (Chu-tsen) in Hankar

Hankar village lies in the upper Markha Valley at an elevation of approximately **4,000 m above sea level** along the well-known trekking route to Nimaling.

Natural hot springs in the area are traditionally used for arthritis, chronic musculoskeletal disorders, neurological conditions, and general physical rejuvenation. Although less developed than the hot springs at Chumathang or Panamik, Hankar remains an important geothermal site within the traditional healthcare system of Ladakh.

Table 5. Major Natural Hot Springs (Chu-tsen) in Ladakh

S. No.	Location	Approx. Elevation (m)	Water Temperature	Predominant Mineral Type (Sowa-Rigpa Classification)
1	Demchok	4,210	Moderate	Chong-shi (Calcite), Muzi (Sulphur)
2	Panamik	3,180*	Very Hot	Chong-shi (Calcite), Muzi (Sulphur)
3	Chumathang	3,950	Moderate	Muzi (Sulphur)
4	Puga	4,400	Moderate	Chong-shi (Calcite), Muzi (Sulphur)
5	Wanla	3,186	Moderate	Chong-shi (Calcite), Muzi (Sulphur)
6	Chilling Sumda	3,195	Moderate	Muzi (Sulphur)
7	Skyu-Kaya	3,500	Moderate	Chong-shi (Calcite), Muzi (Sulphur)
8	Hankar	4,000	Moderate	Chong-shi (Calcite), Muzi (Sulphur)

Overall, the natural hot springs of Ladakh represent an important component of the region's traditional healthcare system and geothermal heritage. Their continued use by local communities and increasing popularity among wellness tourists highlight the need for systematic documentation, hydrochemical

characterization, and clinical evaluation. Integrating the traditional knowledge of Sowa-Rigpa with modern geological, geochemical, and biomedical research could provide valuable evidence for the safe and effective utilization of these unique geothermal resources.

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