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SIACHEN GLACIER AS HIGHEST BATTLEFIELD ON EARTH AND THE THIRD POLE

[1*]Dr. Pruthviraj K. Chaudhary, [1]Shloka V. Chaudhari, [2]Dr. Ramesh D. Chaudhary, [3]Anal Kirtikumar Patel, [4]Sanjaykumar A. Chaudhary, [5]Anandkumar M. Raval, [6]Siddharth R. Chaudhari, [7]Dr. Dhrubo Jyoti Sen and [8]Dr. H. D. Karen

[1]Shri Sarvajanik Pharmacy College, Gujarat Technological University, Arvind Baug, Mehsana-384001, Gujarat, India.
[2]D. N. P Arts and Commerce College, Deesa-385535, Gujarat, India.
[3]Shri Sarvajanik Science College, Mehsana-384001, Gujarat, India.
[4]Shri J.M. Chaudhary Sarvajanik Vidhyalay, Near Arvind Marg, Mehsana-384001, Gujarat, India.
[5]S. V. High School, Kadi, Gujarat, India.
[6]Gokul Global University, Siddhapur-384151, Gujarat, India.
[7]School of Pharmacy, Techno India University, Salt Lake City, Sector-V, EM: 4/1, Kolkata-700091, West Bengal, India.
[8]Tolani Institute of Pharmacy, Nursery Plot, Ward 2A, Opp. Hotel Midtown, Adipur, Kachchh, Gujarat, India.

***Corresponding Author: Dr. Pruthviraj K. Chaudhary**
Shri Sarvajanik Pharmacy College, Gujarat Technological University, Arvind Baug, Mehsana-384001, Gujarat, India.
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ABSTRACT

Siachen Glacier is often called the "Third Pole" because the Himalayan region, where it's located, holds the largest concentration of ice outside the North and South Poles, storing vast freshwater reserves crucial for Asian rivers and populations. It's the second-longest non-polar glacier, known for its extreme conditions and strategic importance as the world's highest battlefield, with India and Pakistan contesting its control.

Why it's called the "Third Pole".

Massive Ice Reserves: The Himalayan glaciers collectively store more freshwater than anywhere else except the polar ice caps.

Water Source: This massive ice reservoir feeds major Asian rivers, impacting water security for a large part of the world.

Key Facts about Siachen.

- Location: Karakoram Range, Himalayas.
- Size: About 76 km (47 miles) long, making it the world's second-longest non-polar glacier.
- Strategic Importance: Site of the world's highest battlefield, controlled by India since Operation Meghdoot in 1984.
- Water Source: Originates the Nubra River, a tributary of the Shyok.

The term "Third Pole" highlights its immense water-storage capacity and vital role in regional climate and water supply, much like the Arctic and Antarctic poles.

The world's coldest and highest battlefield is the Siachen Glacier, a remote, glacier-covered area in the Himalayas where India and Pakistan have maintained military posts at extreme altitudes (over 20,000 ft/6,000m) since 1984, enduring temperatures dropping to -50°C to -60°C and facing severe dangers from avalanches, crevasses, and frostbite rather than just combat.

- Location: Eastern Karakoram Range, Ladakh, India.
- Altitude: Soldiers operate above 20,000 feet (6,000 meters).
- Temperatures: Can plunge below -50°C (-58°F) and even reach -60°C (-76°F) in winter, with hurricane-force winds.
- Conflict: The area is a disputed territory, with both India and Pakistan maintaining forces.
- Dangers: More soldiers have succumbed to the environment (hypothermia, frostbite, avalanches) than to enemy fire.
- Name: Known as the "highest battlefield on Earth" and the "Third Pole".

Challenges for Soldiers.

- Extreme cold and low oxygen.
- Avalanches and treacherous ice.
- Medical issues like high altitude pulmonary oedema (HAPO) and acute mountain sickness (AMS).

KEYWORDS: glacier, HAPO, AMS, third pole, Karakorum Range, LOC.

INTRODUCTION

The Siachen Glacier represents an unparalleled test of endurance, making it a legendary site where human resilience confronts nature's harshest conditions. The Siachen Glacier is a glacier located in the eastern Karakoram Range of the Himalayas, just northeast of the point NJ9842 where the Line of Control between India and Pakistan ends in north-eastern Kashmir.

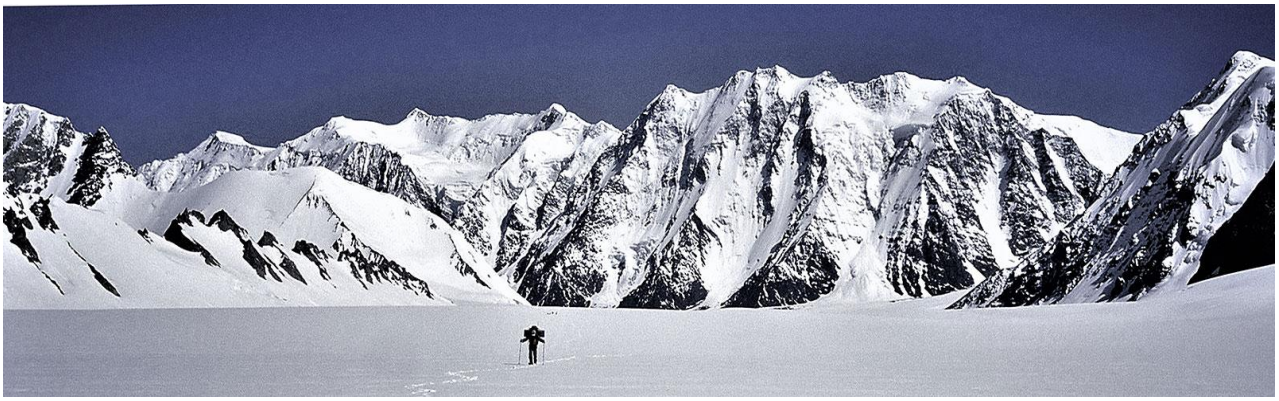

Figure-1: Siachen glacier.

At 76 km (47 mi) long, it is the longest glacier in the Karakoram and second-longest in the world's non-polar areas. It falls from an altitude of 5,753 m (18,875 ft) above sea level at its head at Indira Col on the India–China border down to 3,620 m (11,875 ft) at its terminus. The entire Siachen Glacier, with all major passes, has been under the administration of India as part of the union territory of Ladakh since 1984. The Karakoram Range is located in Northern India, primarily within the Union Territory of Ladakh, extending into Pakistan and China, forming a crucial part of the Trans-Himalayan system and home to massive glaciers and peaks like K2 (though K2 is in Pakistan-administered Kashmir). K2 (Mount Godwin-Austen) is the world's second-highest mountain (8,611m) in the Karakoram Range on the China-Pakistan border, known as the "Savage Mountain" for its extreme difficulty and high fatality rate, famously summited first by Italians in 1954. The name comes from its initial survey designation, but it's also called Chogori.

Height: 8,611 meters (28,251 ft).

Location: Karakoram Range, border of China & Pakistan.

Difficulty: Considered harder to climb than Everest due to severe weather, making it the deadliest 8,000m peak.

First Ascent: July 31, 1954, by Lino Lacedelli and Achille Compagnoni. It sits north of the Great Himalayas, separated by the Shyok River, and is known for its extreme ruggedness and vast ice fields, like the Siachen Glacier.

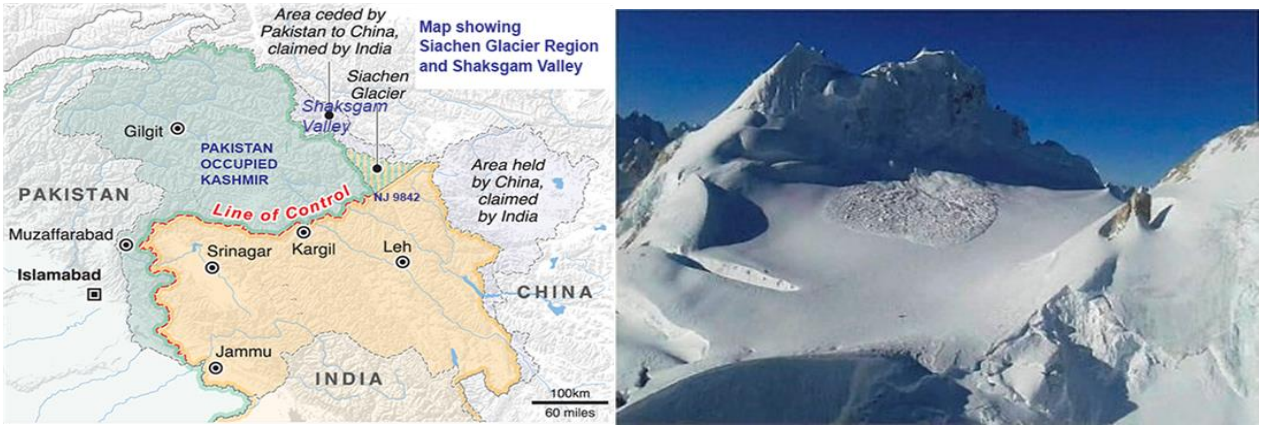

Figure-2: Line of control & Danger of Siachen glacier.

Key Locations in India

- Ladakh: A significant portion of the range falls within Ladakh, making it a vital area for Indian Karakoram geography.
- Sia-chen Glacier: The world's longest non-polar glacier is located here, a major feature of the Indian Karakoram.
- Nubra Valley: The Shyok River flows through this valley, separating the Karakoram from the Ladakh Range.

Geographical Context: It's considered the northernmost range of the Trans-Himalayan system in India. It acts as a natural boundary between the Indian subcontinent and Central Asia. In essence, if you look at a map of India's northern frontiers, the Karakoram range runs along the border, with its Indian presence concentrated in the high-

altitude deserts and valleys of Ladakh. The largest glacier in India is the Siachen Glacier, located in the Karakoram Range of the Himalayas, stretching about 76 kilometers (47 miles) long, making it the world's longest glacier outside Polar Regions and a significant source for the Nubra River.

Key Facts:
Location: Eastern Karakoram Range, Himalayas, bordering India and Pakistan.
Length: Approximately 76 km (47 miles).
Significance: It's the world's second-longest non-polar glacier and feeds the Nubra River, a tributary of the Indus.
Nicknames: Known as the "highest battlefield on Earth" due to military contention.
While other major glaciers exist in India, such as the Gangotri Glacier (source of the Ganga), Siachen is recognized as the largest by length and area within Indian Territory.
The Siachen Glacier is known as the world's highest battlefield, where India and Pakistan have maintained military presence since 1984, fighting intermittently at altitudes over 6,000 meters (20,000 ft) in extreme conditions, with most casualties from weather and terrain, not combat. India launched Operation Meghdoot to secure the glacier, a strategic move to control the high ground in the Karakoram Range, making it a symbol of military resilience and extreme mountain warfare.

Key Aspects of the Siachen Battlefield:
- Extreme Environment: Soldiers endure temperatures dropping to -50°C, blizzards with high winds, and thin, oxygen-deprived air, making daily tasks treacherous.
- High Stakes: The conflict began after cartographic disputes led to India preemptively capturing the glacier to control strategic heights like the Saltoro Ridge.
- High Casualties: The harsh environment, including avalanches, frostbite, and altitude sickness, has caused far more deaths than direct combat.
- Military Logistics: Both nations sustain large deployments, requiring advanced logistics, specialized clothing, and technology like 5G to support troops in this inhospitable terrain.
- Peace Efforts: Despite the ongoing military presence, there have been calls for peace and demilitarization, recognizing the immense human and financial cost.

In essence, Siachen is a unique battleground defined by nature's fury, testing military capabilities and human endurance at the planet's highest altitudes. At a staggering 18,000 feet above sea level, where oxygen levels drop drastically, the Siachen Glacier remains the world's highest battlefield. High altitude clothing or Extreme Cold Climate clothing (ECC) is a type of multilayer clothing used in very cold climate zones like Siachen. There, the clothing needs to meet both functional as well as comfort parameters and comprises jackets, waistcoats, trousers, glacier caps, rappelling gloves and glacier gloves. The medical problems on the glacier include high altitude pulmonary oedema, acute mountain sickness, frost bite chilblains, hypothermia, snow blindness, injury non enemy action due to avalanches, crevasses and fires, carbon monoxide poisoning and problems in disposal of night soil.

The coldest temperatures in the Siachen Glacier region can plummet to around -50°C to -60°C (-58°F to -76°F) during the harsh winter months (December/January), with soldiers facing these extreme conditions daily. More soldiers have died from the extreme cold, high altitude, and avalanches than from combat, making it the world's highest and most inhospitable battlefield.
Typical Winter Lows: Around -50°C to -60°C.
Recorded Low: Some sources mention records as low as -60°C in 1995.
Average Winter Temperatures: Often range from -20°C to -30°C.
Summer Temperatures: Can rise to around 10°C (50°F).
Why it's so cold:
High Altitude: The glacier sits at extreme elevations, with parts reaching over 5,700 meters (18,700 feet).
Karakoram Range: Located in the Himalayas, it's a part of one of the world's most formidable mountain ranges.

Figure-3: Avalanche in Siachen.

Points of Danger in Siachen Glacier: The Siachen Glacier's dangers stem from its extreme environment: avalanches, deep crevasses, frigid temperatures (below -60°C), high-speed winds, and low oxygen causing altitude sickness (HAPO, HACO, frostbite), making it the world's highest, deadliest battlefield where weather kills more than combat. Key dangerous points include unstable ice slopes, high-altitude areas with thin air, and zones prone to sudden snowstorms and ice melts.

Environmental Hazards

1. Avalanches & Icefalls: Massive snow and ice slides can bury entire posts, with devastating historical examples.
2. Crevasses: Deep, hidden cracks in the glacier pose a constant threat of sudden falls.
3. Extreme Cold: Temperatures can drop below -60°C, causing rapid frostbite (skin freezing to metal) and chilblains, leading to amputations.
4. High Winds: Speeds over 100 mph can make conditions deadly, especially during snowstorms.
5. Low Oxygen: Affects soldiers, causing weight loss, sleep disorders, and severe altitude sickness.
6. Snowstorms: Weeks-long blizzards can isolate troops, making survival extremely difficult.
7. Location-Specific Dangers:
8. High-Altitude Zones: Areas above 15,000 feet present severe risks for altitude-related illnesses.
9. Melting Ice Slopes: Clear, sunny days can destabilize ice, increasing risks of slips and avalanches as the ice melts.
10. Strategic Points (e.g., Saltoro Ridge): These higher, contested areas are critical but exposed, making patrols perilous.
11. Human & Operational Dangers:
12. Frostbite: Touching any cold surface (like gun barrels) for even seconds can cause tissue damage.
13. Medical Issues: Beyond frostbite, conditions like oedema, blood clots, and lung infections are common.
14. Waste Accumulation: Military waste poses environmental risks, potentially contaminating water sources like the Indus River system.

In essence, soldiers face a constant battle against the glacier itself, where survival hinges on immense resilience and specialized equipment to counter nature's extreme forces.

CONCLUSION

Siachen Glacier is extremely dangerous and is known as the world's highest and coldest battlefield. The primary threats come from the severe natural conditions rather than enemy combat, claiming more lives than gunfire.

Primary Dangers

The main hazards in the Siachen Glacier region are.

Extreme Weather: Temperatures can plummet to as low as -60°C (-76°F), with blizzards that can last for weeks and winds reaching speeds of 100 mph.

Avalanches: These are a frequent and deadly occurrence due to heavy snowfall and steep slopes. Avalanches are the single biggest cause of fatalities in the region, burying soldiers and outposts.

High Altitudes: The glacier is at an altitude of over 6,000 meters (20,000 ft), where the human body cannot properly acclimatize and begins to deteriorate. Soldiers face severe health risks:

High-altitude Pulmonary Oedema (HAPE): Fluid accumulation in the lungs, which can be fatal within hours.

High-altitude Cerebral Oedema (HACE): Fluid leaking into the brain, causing swelling, hallucinations, and potentially death within 24 hours.

Frostbite and Chilblains [painful red area on your foot, hand that is caused by cold weather]: Touching metal surfaces for even 15 seconds with bare skin can cause severe frostbite, leading to the loss of fingers, toes, or limbs.

Loss of Appetite, Sleep Disorders, and Memory Loss: Common physiological problems due to the lack of oxygen.

Treacherous Terrain: The landscape is full of hidden dangers, including deep, bottomless crevasses covered by thin layers of snow that can suddenly give way.

Logistical Challenges: Resupply by helicopter is a risky operation and can be impossible during prolonged bad weather, leading to isolation.

Due to these formidable conditions, hundreds of Indian and Pakistani soldiers have lost their lives since the conflict began in 1984, mostly to the environment rather than enemy fire. If the records are seen, 846 soldiers have lost their lives in last 30 years. To salute the valour and courage of soldiers, the Pak Army has decided to treat every soldier who dies at Siachen because of adverse conditions and cold climate will be treated as battle casualties.

REFERENCES

1. https://en.wikipedia.org/wiki/Siachen_Glacier