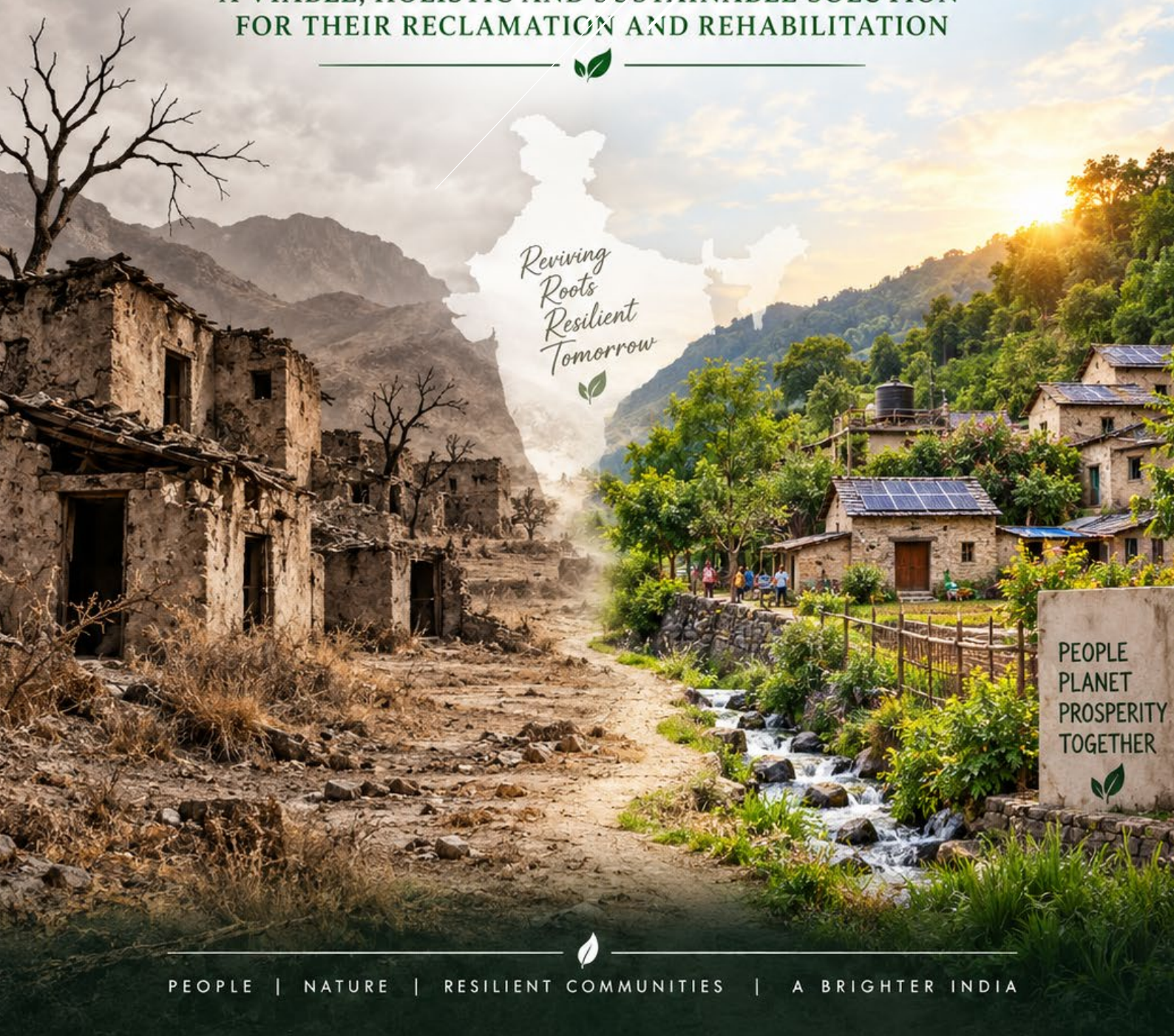
Vaidic Srijan

PRESENTS

GHOST VILLAGES OF INDIA

THE GROUND REALITY OF CLIMATE CHANGE IN GRASSROOTS

A VIABLE, HOLISTIC AND SUSTAINABLE SOLUTION FOR THEIR RECLAMATION AND REHABILITATION



PEOPLE | NATURE | RESILIENT COMMUNITIES | A BRIGHTER INDIA

"Dedicated to the villagers,
who were forced to migrate
because of the
unsustainable lifestyle
developed in Bharat post
the revolution of 1857."

About The Author

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He's been associated with MAI foundation's various programs including the yearly Global Leadership Summit, Climate Action and Education Forum, Africa Sustainability Week, and this year got associated with GLS Mentorship Program 2026 as well as Global Learn-To-Earn Academy, as a mentor.

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Ghost Villages of Bharat and the key reasons behind ghosting

Baluni, Bhel Dunga, Saina, Gattumeedapalle and Hatkarwadi – are prominent examples of villages in Bharat that have been deserted or nearly depopulated due to extreme Water scarcity, drying natural springs, recurrent droughts, and climate impacts. The individual details, official land areas (from the Census of Bharat and regional land surveys), and state locations for notable depopulated settlements include the following:

Deserted Villages Affected by Water & Climate Crises

Village Name	**State**	**Approximate Geographical Area**	**Primary Ecological Crisis**
Baluni	**Uttarakhand** (Pauri Garhwal)	**50.63 hectares** (0.51 km^2)	Drying of mountain springs, erratic rainfall, and agricultural failure leading to total depopulation (zero residents).
Bhel Dunga	**Uttarakhand** (Pauri Garhwal)	**139.84 hectares** (1.40 km^2)	Severe hydrological crisis, loss of natural hillside aquifers, and crop loss from erratic cloudbursts.
Saina	**Uttarakhand** (Pauri Garhwal)	**76.22 hectares** (0.76 km^2)	Complete decline in rain-fed mountain irrigation and extreme Water transport hardship.
Gattumeedapalle	**Andhra Pradesh** (Annamayya)	**45–60 hectares** (0.50 km^2 settlement & hillock)	Consecutive multi-year monsoon failures and total collapse of the local groundWater table.
Hatkarwadi	**Maharashtra** (Beed)	**164.00 hectares** (1.64 km^2)	Acute drought in the Marathwada belt, dried-up open wells/borewells, and 45°C+ summer heatwaves forcing out over 90% of the population.

Average Area Summary

- Across the hilly regions of the western Himalayas (where the state migration commission has catalogued over 700–1,000 completely abandoned ghost villages), the **average area per village typically ranges between 50 and 120 hectares** (roughly **0.5 km^2 to 1.2 km^2**).
- In arid and semi-arid plains (such as **Maharashtra** and **Rajasthan**), individual revenue village boundaries tend to be larger, averaging between **150 and 300 hectares**.

To understand how Bharat is addressing this mass rural exodus, it is helpful to look at **Pauri Garhwal** (Uttarakhand) and **Beed** (Maharashtra). These two districts represent the frontlines of the crisis. Government initiatives are moving away from traditional relief models toward **climate-resilient, community-driven restoration**. The target regions, block-level data, and specific Water-revival policies designed to restore these ghost villages include the following:

1. Block-Level Impact Data

The concentration of abandoned or nearly empty villages varies significantly by region:

- **Pauri Garhwal District (Uttarakhand):** This district contains the highest number of ghost villages in Bharat. The **Dwarikhal**, **Kaljikhal**, and **Pauri** blocks are the most affected. According to data from the Uttarakhand Rural Development and Migration Prevention Commission, over **180 villages** in these blocks alone have been completely depopulated due to dried-up mountain springs (*naulas*) and erratic rainfall.
- **Beed District (Maharashtra):** In the hyper-arid Marathwada region, the **Ashti**, **Kaij**, and **Majalgaon** blocks experience severe seasonal desertion. During peak summer months, up to **70% of residents** in villages like **Hatkarwadi** temporarily or permanently migrate to cities like Mumbai and Pune due to a total lack of drinking Water.

2. State-Level Rehabilitation & Water Revival Policies

To reverse this migration and make these abandoned landscapes liveable again, state governments are deploying specialized ecological and economic strategies:

- **The Springshed Management Program (Uttarakhand):** Traditional Water engineering fails in mountain terrains because it relies on groundWater pumping. Uttarakhand's flagship policy focuses on **geo-tagging and rejuvenating dead natural springs**. Using isotope hydrology, geologists map underground aquifers to create "recharge zones" through trenching, checking dams, and planting broad-leaved trees like Oak (*Banj*) which retain Soil moisture far better than commercial Pine.

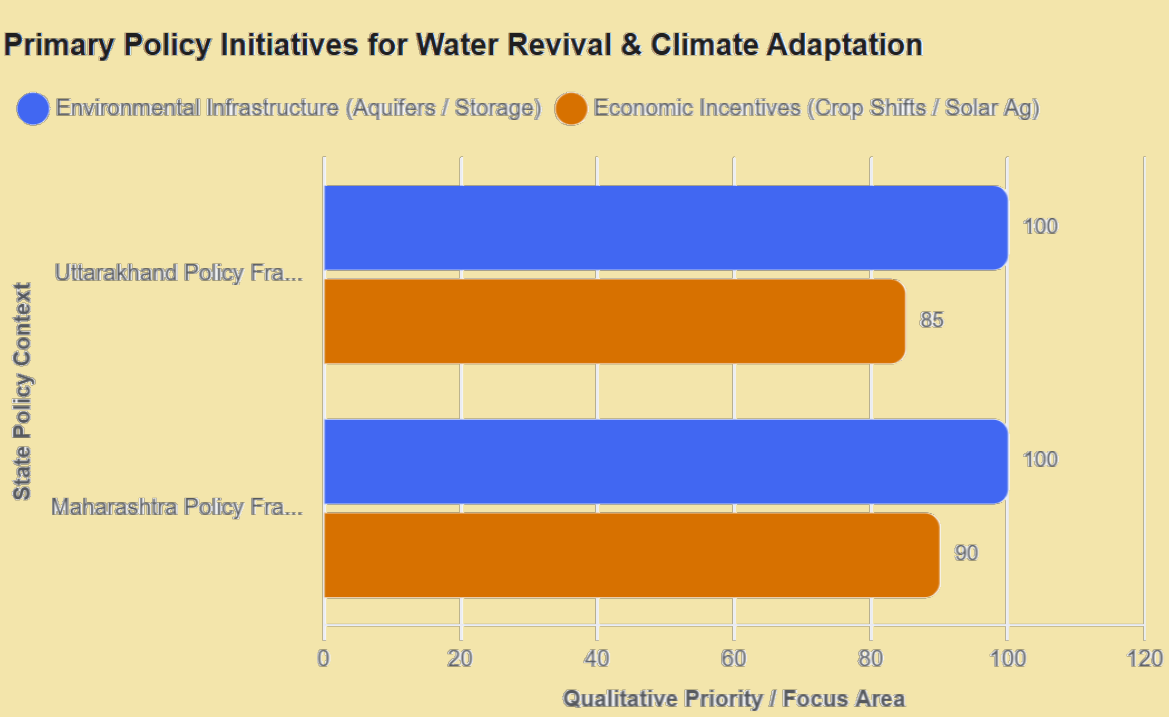
- **Jalyukt Shivar Abhiyan (Maharashtra):** This policy aims to make Maharashtra "drought-free" by breaking the dependence on erratic monsoon rains. The program deepens and widens existing streams, de-silts old village ponds, and constructs cement nala bunds. This massive structural overhaul stores surface Water and forces it to seep back into the ground, raising the Water table across depleted blocks. **Flipside:** Deepening and widening existing streams and desilting the old ponds, creates multiple environmental and ecological challenges. Refer this video on YouTube - https://youtu.be/J6Z3SopG4Wk?si=_TMmD1p4uPaB9HMZ to understand the lacunae in the concept of desilting. Again, constructs cemented nallahs, disconnect the natural Soil capillary link between surface stream and aquifer, therefore are not sustainable solutions.
- **Chief Minister's Solar Agriculture Feeder Scheme:** To combat the power shortages that prevent farmers from pumping what little Water remains, Maharashtra provides dedicated solar grids for rural irrigation. This guarantees daytime power to farmers, reducing crop failure risks. **Flipside:** How does over extraction of already depleted aquifer helps in building climate resilience? Wouldn't it accelerate the zero-day instead? Building climate resilience can't be done through a patch work for 'postponing' the problem, it is a real problem, caused due to unsustainable lifestyles of the people in last 100 years, and it calls for an ecological solution that solves the issue from grass-roots level.
- **Transition to Climate-Resilient Agriculture:** Both states are actively disincentivizing Water-intensive crops. In Uttarakhand's abandoned villages, the government provides subsidies for families to return and cultivate **a**romatic plants (like Damask Rose and Lemongrass) and wild culinary herbs instead of traditional rice. These crops do not require heavy irrigation and are ignored by wild boars and monkeys, which frequently destroy food crops in empty villages. **Flipside:** How can introduction of an invasive species help restore the native ecology? Damask Rose (*Rosa damascena*) is okay, since it belongs to the same agroclimatic zone, but Lemongrass (*Cymbopogon flexuosus*)? It is native to the West Coast Plains and Ghats Region (Zone 12) and the Southern Plateau and Hills Region (Zone 10), primarily found in Kerala, Karnatak and Tamil Nadu. This in no way Climate-Resilient Agriculture. To build climate resilience, the very premise or methodology of agriculture has to change. Refer to this video - https://youtu.be/tBd_NuH6x5A?si=TVc-94luRssd2GUK on YouTube for Climate resilient agriculture solution.
- **The "Ghar-Ghar Jal" Infrastructure Push:** Under the national *Jal Jeevan Mission*, the government is laying localized gravity-flow pipelines to pump Water up steep hilltops directly into abandoned households, removing the daily physical burden

of fetching Water from distant valleys. **Flipside:** This is a wonderful scheme to ensure ease of life for the mountainous regions of North and East Bharat, wherein people are living in the tough terrains. But any good scheme remains as good as it gets implemented on ground, like a chain is as strong as the weakest link. When every home gets Water through tap, every home will also generate sewage, which will land into the village Waterbody. Unfortunately, the HGNJY doesn't provision for that.

Comparison of Restoration Frameworks

The two states use different primary strategies to restore these environments:

State	Primary Policy Focus	Core Method	Economic Incentive to Return
Uttarakhand	**Spring Hydrology**	Recharging mountain aquifers and mountain spring networks (*naulas*).	Subsidies for cash-rich, low-Water aromatic farming (e.g., Lavender, Rose oil).
Maharashtra	**Decentralised Storage**	De-silting streams, building check dams, and expanding surface Water storage.	Guaranteed solar power for micro-irrigation and crop insurance payouts.



Financial Subsidies for Returning Families

Both Uttarakhand and Maharashtra have designed targeted subsidy and capital-assistance packages to lower the economic barrier for displaced families returning to abandoned and Water-stressed villages:

- **Aromatic Farming Promotion Scheme (Uttarakhand):** Administered by the Centre for Aromatic Plants (CAP) under the Horticulture Department, this program provides **80% capital subsidies for cultivating aromatic plants** (such as Damask Rose, Lavender, and Lemongrass) on up to 1 hectare of land. For land sizes exceeding 1 hectare, the state extends a **50% subsidy**. The government covers the cost of planting material, distillation unit access, and crop insurance, offering viable cash generation in areas where traditional agriculture dried out.
- **Veer Chandra Singh Garhwali Tourism Scheme (Uttarakhand):** Designed to incentivize reverse migration by leveraging empty ancestral homes for eco-tourism and homestays, this program provides a **capital subsidy of up to 33% (capped at ₹33 lakh)** for non-vehicle projects (such as homestays, fast-food centres, and trekking bases) in hilly, depopulated districts.
- **Drip and Micro-Irrigation Subsidies (Maharashtra):** Under the *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY) and state top-up schemes, small and marginal farmers returning to dry belts like Beed and Osmanabad receive up to **75% subsidies for installing drip and sprinkler systems**, minimizing Water use while maximizing yield.
- **Magel Tyala Farm Pond (Shet Tale) Scheme (Maharashtra):** Farmers receive a direct financial subsidy of up to **₹50,000 to ₹75,000** directly deposited to construct lined farm ponds on their land, enabling decentralized rainWater harvesting for individual holdings.
- **Mukhyamantri Saur Krishi Vahini Yojana (Maharashtra):** Provides highly subsidized (up to **90–95% subsidy**) off-grid solar pumps to farmers in drought-prone blocks, freeing returnees from expensive diesel pumps and irregular grid electricity.

Before-and-After Satellite & Hydrological Assessments

Scientific assessments using remote-sensing satellite imagery (such as Sentinel-2, Landsat, and ISRO's BHUVAN portal) paired with observation-well data have evaluated the physical impact of these interventions:

1. Maharashtra (Marathwada & Beed District)

- **Surface Water Retention (NDWI Indices):** Satellite analysis using the Normalized Difference Water Index (NDWI) demonstrated that decentralized check dams and de-silted nala bunds under *Jalyukt Shivar Abhiyan* extended

seasonal surface-Water retention in micro-Watersheds by 45 to 60 days post-monsoon. **Flipside:** What happens 60 days after monsoon? Do we expect the population to migrate again? We need to make Waterbodies perennial, for which restoration of the aqua-ecology is a mandate. Nature can't be made to follow human political will or schemes. The intervention needs to be holistic and in absolute harmony with nature. Refer this video - https://youtu.be/fjGcBKck8ys?si=JM5Vv8g1Gnz5ctlz

- **GroundWater Fluctuations:** GroundWater Survey and Development Agency (GSDA) observation wells in treated villages (such as in the Ambajogai block of Beed) recorded a localized **post-monsoon Water-table rise of 1.5 to 3.0 meters** in villages with intensive Watershed contouring. With a consistent rise at this rate a long-term sustainability of the villages can be insured, which calls for a consistent monitoring and maintenance of the natural resources and infrastructure. Here's a case study from Moradabad, wherein the ground Water recharge has shown substantial improvement after adoption of NbS - https://youtu.be/E6628oWMLno?si=Juofqd-xHGOQvBg1
- **Vegetation Cover (NDVI):** Satellite-based Normalized Difference Vegetation Index (NDVI) mapping showed a **15% to 25% expansion in rabi (winter) crop canopy area**, reducing summer tanker dependence by over 80% in well-managed Watersheds. Here's a concept note video, taking Haryana as an example, that proposes restoration of the village economy - https://youtu.be/DfK-QPM-p7U?si=-TbqOZYTa3eIoN68
- **Caveat on Over-Extraction:** Audits by the Comptroller and Auditor General (CAG) and GSDA revealed that in villages where groundWater replenishment succeeded, unregulated sugarcane cultivation and uncontrolled private borewell drilling frequently erased the Water table gains within 2 to 3 dry years.

2. Uttarakhand (Springshed Rejuvenation in Pauri Garhwal)

- **Spring Discharge Recovery:** Monitoring by the National Institute of Hydrology (NIH) using isotopic tracer mapping showed that artificial recharge trenches and broad-leaf plantation zones increased lean-season discharge of drying mountain springs (*dhharas* and *naulas*) by **20% to 45%**. The big question is – has that resulted in the reverse migration? If yes, why are the villages still deserted? If no, it simply means that the efforts may be good on paper, but the practical on ground reality hasn't changed. Monitoring and data collection is necessary, but that must lead towards a positive impact on ground. Otherwise, it would be like the famous Allan Savory case study, who famously promoted the culling of approximately 40,000 elephants in Zimbabwe (then Rhodesia) during the 1960s before realizing it was a catastrophic mistake

- **Runoff Reduction:** Satellite terrain modelling confirmed that contour trenches along mountain ridges reduced high-velocity runoff during heavy cloudbursts, successfully trapping Soil moisture and replenishing mid-slope fracture aquifers rather than washing away top Soil. The traditional step farming has been practised for ages in mountainous region of Bharat, but since it is labour intensive, people have started looking for options. Here are few modern improvised options to overcome the limitation of traditional step farming –

Traditional Shortcoming	***Modern Overcoming Method***	***How It Works***
Heavy Manual Labour	Light-weight Mechanization & Precision Drones	Lightweight, hand-operated power tillers engineered specifically for narrow hill steps replace manual ploughing. Agricultural drones are deployed to precisely spray organic inputs or seeds across multi-tiered levels without human physical exertion.
Over-saturation & Flooding	Fuzzy-Controlled Smart Irrigation	Instead of relying solely on gravity flooding, modern step farms utilize automated drip-irrigation systems driven by **Fuzzy Logic Controllers (FLC)** and IoT Soil-moisture sensors. Water is delivered precisely on data demand, lowering Water use and entirely preventing Soil over-saturation.
Structural Collapse Risks	Geotextile Engineering & Hydro-Zoning	To reinforce step walls, modern engineering introduces **geotextile membranes** and structural mesh grids. Combined with gravity-fed Water-flow networks that channel excess Water safely into valley fish ponds, it mitigates landslide risks while recycling nutrients.
Space & Scalability Limits	Vertical Agroforestry & Stacked Hydroponics	Rather than relying on widening massive land steps, farmers integrate deep-rooted trees along the contour edges (**Agroforestry**) to lock the Soil naturally. In closed microclimates, steps are combined with vertical stacked horizontal systems (like hydroponics or aquaponics) to multi-fold production on the same small footprint.

1.**Baluni**, Pauri Garhwal, Uttarakhand (29.9324° N, 78.6838° E)

Baluni (https://maps.app.goo.gl/MdMiUsb8Vedfyxug6) is a completely abandoned ghost village (*Bhutya Gao*) located in the Pauri Garhwal district of Uttarakhand, officially recorded as having zero permanent residents after its last solitary inhabitant departed in January 2018.

Covering roughly 50.63 hectares (0.51 km^2) in the rugged Himalayan foothills, Baluni became a national symbol of distress migration (*palayan*) triggered by failing mountain hydrology and rural neglect.

The story of Baluni unfolded in several stages:

1. A Thriving Hill Settlement

Decades ago, Baluni was a self-sustaining mountain hamlet comprising around 15 joint families practicing traditional terrace cultivation. Like many Garhwali settlements, the village relied on local mountain streams and natural springs (*naulas*) for drinking Water and domestic use, growing traditional rain-fed mountain crops.

2. Ecological Decline and Water Exhaustion

Over recent decades, shifting climate patterns and rising temperatures dried up the hillside aquifers feeding Baluni's springs.

- **The Water Crisis:** Villagers had to trek increasingly long, treacherous distances down mountain gorges just to fetch basic drinking Water, as nearby natural Water discharge slowed to a trickle.
- **Crop Vulnerability:** With monsoons turning unpredictable and wild animals (monkeys and wild boars) raiding the remaining drying terrace farms, subsistence farming collapsed.
- **Gradual Depopulation:** By the 2011 Census of Bharat, the population had dwindled to just 32 residents across 11 families. One by one, young working-age residents moved away to industrial hubs and plains cities like Kotdwar, Dehradun, and Delhi.

3. The "Lone Sentinel" of Baluni

By 2014, the entire village had emptied out except for one man: Shyam Prasad Baluni, an ex-Army soldier.

- After retiring in 1985, Prasad refused to leave his ancestral home even after his wife passed away and his children moved away.

- For roughly four years, he lived as the sole inhabitant of the village, guarding the dilapidated stone-and-wood houses and the village temple, earning coverage from national media as the "lone sentinel" of the ghost village.
- He routinely remarked that had the government provided a functional drinking Water pipeline decades earlier, several families would never have left.

4. The Final Exodus and Tragic Irony

In January 2018, battling deteriorating health and old age, Shyam Prasad could no longer manage fetching Water and living in isolation. He packed his bags, hired a vehicle, and moved to Kotdwar to live with his family.

In a tragic irony reported by local journalists, the government's newly excavated road and drinking-Water connection finally reached the boundary of Baluni right around the time Prasad packed his bags to leave—arriving only after the village had already reached zero inhabitants.

Current Status

- **Dilapidation & Wildlife:** Today, the village is largely overgrown with wild thorny shrubs and creepers, with locked and collapsed wooden-slate roofs. Wild animals, including leopards and sloth bears, frequently shelter in the abandoned courtyards and cattle sheds.
- **Annual June Gathering:** Although permanently uninhabited, former villagers and their descendants travel back for two to three days every June. They clean the village temple, host a religious festival with a fair-like atmosphere, and spend time reconnecting with their ancestral roots before locking the houses and returning to the plains.

2.Bhel Dunga, Pauri Garhwal, Uttarakhand (29.9814° N, 78.4358° E)

Bhel Dunga (also spelled Bheldunga) (https://maps.app.goo.gl/UPt1eKYbbAb6xoxY9) is a severely depopulated "ghost village" situated in the **Yamkeshwar block and tehsil of Pauri Garhwal district**, Uttarakhand.

Covering a total geographical area of **139.84 hectares (1.40 km^2)** and under the Faldakot Malla gram panchayat, it lies roughly **35 kilometres away from the nearest prominent city, Rishikesh**. Its history reflects a classic and painful pattern of ecological breakdown, severe infrastructural isolation, and wildlife conflict seen across the Himalayan hills.

The story behind Bhel Dunga's rapid slide into desertion highlights several key factors:

1. The Hydrological Shock and Climate Shifts

Decades ago, Bhel Dunga was a fully populated, tranquil mountain hamlet sustained by generational terrace farming. The village relied extensively on traditional rain-fed agriculture and natural mountain springs (*naulas*) for potable Water.

- As climate change rapidly skewed weather patterns in Pauri Garhwal, **the natural spring lines on the slopes began to run dry** due to rising heat and erratic rainfall.
- Crop yields collapsed. The rain-fed irrigation channels became completely useless, plunging families into acute economic stress.

2. Extreme Infrastructural Neglect

Compounding the Water crisis was the sheer physical isolation of the village. Despite its massive land footprint, Bhel Dunga lacked essential connectivity to the plains for a long time.

- For years, basic facilities like a properly metalled motorable road, immediate medical care, and secondary schools were non-existent.
- To access emergency healthcare or buy essential supplies, residents had to travel long distances through steep and treacherous mountain paths, which became a breaking point for young families wanting to educate their children.

3. The Threat of Wild Animals

As parts of Bhel Dunga began losing residents to the plains, the shrinking human presence triggered a secondary crisis: **human-wildlife conflict**.

- The lack of active farming allowed wild, thorny vegetation and scrub forests to quickly reclaim the terrace edges.
- This overgrowth turned into an ideal hunting ground and shelter for wild boars and leopards.
- As wild boars routinely destroyed whatever little baseline food crops remained, frequent leopard sightings and attacks on cattle made it physically unsafe to step out after sunset, entirely paralyzing normal rural life.

4. The Last Stand of the Final Four

The mass exodus (*palayan*) was fast and relentless. Generational families systematically abandoned their ancestral homes, migrating permanently to plains cities like Rishikesh, Kotdwar, Dehradun, and Delhi.

- By the 2011 Census of Bharat, the village had already drastically shrunk to a mere **31 inhabitants across just 10 lingering families**.
- In the years that followed, the migration intensified to a critical extreme. According to field reports and documentation on regional migration tracking, the village eventually bottomed out to **just four elderly residents—Rakesh Juglal, Kalawati Devi, Anju Devi, and Goli Devi**. These final few functioned as the last living sentinels of a sprawling 139-hectare village, watching over locked, silent, and decaying stone structures.

Current Scenario

While places like Bhel Dunga stand as a testament to the environmental crises facing Uttarakhand, the state government has been utilizing the *Chief Minister's Migration Prevention Scheme* to incentivize people to return. Because Yamkeshwar block sits geographically closer to the major spiritual and tourism hubs of Rishikesh and Haridwar, Bhel Dunga's high acreage and proximity make it a frequent subject for experimental reverse-migration plans, including organic horticulture and dairy farming startups.

3.Saina, Kotdwara, Pauri Garhwal, Uttarakhand (29°53'49.9"N 78°34'59.2"E)

Saina (also spelled सैणा) (https://maps.app.goo.gl/KkyCNCfe1LSmhnct7) is a prominent, near-empty **"ghost village"** located in the **Dwarikhal development block** of Kotdwara tehsil in the **Pauri Garhwal district** of Uttarakhand.

Spanning an official geographical area of **76.22 hectares (0.76 km^2)**, Saina holds a significant place in Bharat's national consciousness. It is the **ancestral home of Bharat's first Chief of Defence Staff (CDS), late General Bipin Rawat**. Despite producing one of the country's highest-ranking military leaders, the village could not escape the severe environmental and hydrological degradation plaguing the Himalayan hills, turning it into a poignant symbol of *palayan* (mass rural out-migration).

The story of Saina reflects a mixture of national pride, acute ecological crisis, and modern infrastructure struggles:

1. A Legacy of Martial Service

Historically, Saina was a vibrant mountain community predominantly inhabited by families with deep military roots. For generations, almost every household sent its youth to serve in the Armed Forces. General Bipin Rawat's father, Lieutenant General Laxman Singh Rawat, also rose from this very village.

The village operated on traditional subsistence terrace farming, heavily dependent on the predictable patterns of the Himalayan monsoons and local fresh Water springs (*naulas*).

2. The Ecological Shock and Agricultural Collapse

As climate change altered the weather patterns across Pauri Garhwal, the village faced twin ecological crises:

- **Water Depletion:** Rising temperatures and shifts in underground aquifers caused the mountain springs feeding the village to completely dry up, rendering traditional irrigation systems obsolete.
- **Wildlife Invasions:** As the surrounding land dried out, wild animals—specifically wild boars and monkeys—began aggressively raiding the remaining terrace farms, destroying whatever baseline food crops the residents planted. Frustrated by continuous losses and the sheer physical exhaustion of fetching Water from distant valleys, families began abandoning their ancestral homes.

3. Deep Depopulation to a Single Household

The exodus was so severe that by the **2011 Census of Bharat**, Saina had officially shrunk to one of the least populated villages in the entire Dwarikhal block, recording **only 5 permanent residents across just 2 households**.

By 2022, on-the-ground media reports from outlets like *The Quint* confirmed that the village had bottomed out to **just a single remaining family**. This final family—including General Rawat's uncle, Bharat Singh Rawat, a retired army veteran—stayed behind as the sole custodians of the village's heritage, living in a home that required walking 15–20 minutes through isolated mountain terrain just to reach the nearest motorable road.

4. The Unfulfilled Dream of Return

During a highly publicized visit to his ancestral roots in **April 2018**, General Bipin Rawat walked a kilometre uphill to reach Saina. Seeing the hollowed-out, locked stone houses, he expressed deep concern over the massive migration affecting the hills.

He announced plans to **build a retirement home in Saina** to encourage other families to return, hoping to jumpstart local development, reverse the migration trend, and improve road connectivity. Tragically, his vision of moving back to breathe new life into Saina was cut short by his untimely demise in a helicopter crash in December 2021.

Current Status

Today, Saina stands as a quiet, sombre site of historical pride and ecological caution. While the village's extreme structural isolation and lack of Water led to its near-total desertion, its high profile has made it a focal point for state conversations regarding **reverse migration and hill rehabilitation policies**.

4.Gattumeedapalle, Annamayya, Andhra Pradesh (13.6906° N, 78.4946° E)

Gattumeedapalle (https://maps.app.goo.gl/dLayemn7XCsgwTY39) is an abandoned **"ghost village"** located in the **Annamayya district** (near Madanapalle) of Andhra Pradesh, Bharat. Perched atop a **200-foot hillock**, the village transitioned from a bustling agricultural hub into a completely deserted settlement due to severe environmental and economic crises. The story of Gattumeedapalle highlights the severe impacts of climate change, groundWater depletion, and rural migration in Bharat:

1. A Once-Thriving Community

Historically, Gattumeedapalle was a vibrant, close-knit rural community. It was home to approximately **60 joint families and around 500 residents**. The village thrived primarily as a major local hub for **groundnut cultivation** and general farming.

2. The Ecological Collapse

The decline of the village began aggressively in the **1980s** when successive monsoon seasons failed.

- **Water Crisis:** Desperate to save their crops, villagers drilled dozens of deep borewells. However, every single borewell failed as the groundWater table completely dried up.
- **Economic Ruin:** With no Water for agriculture, repeated crop failures destroyed the village economy.

3. Isolation and Lack of Infrastructure

In addition to the Water scarcity, the village suffered heavily from geographical isolation. Being located on top of a steep hillock, it lacked proper road connectivity, basic infrastructure, and dependable transport. This lack of facilities made everyday survival incredibly difficult once the local farming economy collapsed.

4. Mass Migration and Abandonment

With no jobs, no Water, and no transport, the residents were forced to leave their ancestral homes behind. A massive wave of rural out-migration took place. Families packed up and relocated to nearby economic centres to find alternative livelihoods, primarily moving to cities like Bengaluru, Kolar, Tirupati and Madanapalle

Current Status

Today, Gattumeedapalle stands entirely empty, with **zero permanent residents left**. The village features rows of empty, deteriorating houses and silent streets.

5. Hatkarwadi, Shirur, Beed, Maharashtra (18.0264° N, 75.6478° E)

Hatkarwadi (https://maps.app.goo.gl/Tp7Zq2Kwv6gGtc5k6) is a severely drought-hit "ghost village" located in the **Shirur (Kasar) taluka of Beed district**, in the arid **Marathwada region of Maharashtra**, Bharat.

Spanning an area of **164 hectares (1.64 km^2)**, Hatkarwadi became the national face of Bharat's **"Water refugees"** following international media coverage by outlets like the BBC. It serves as a stark illustration of environmental displacement in the rain-shadow belts of western Bharat.

The story of Hatkarwadi is defined by climate catastrophes, mass distress migration, and fractured families:

1. From a Bustling Farming Village to Barely 15% Population

Not long ago, Hatkarwadi was a fully functioning, close-knit rural community consisting of around **125 homes and over 1,200 residents**. The villagers primarily depended on rain-fed agriculture and animal husbandry, successfully cultivating crops like sorghum, pearl millet (bajra), maize, soyabean, and cotton when the monsoons were reliable.

2. The Micro-Climate Collapse and Deforestation

Beed district sits squarely within a geographical rain shadow, meaning it naturally receives limited monsoon rain. However, rapid environmental degradation accelerated the village's collapse:

- **Deforestation:** Extreme logging and land-clearing reduced Beed's forest cover to a catastrophic **2% of its total land area**.
- **Fickle Rainfall:** The region entered a multi-year cycle of compounding droughts. Even in years when cumulative seasonal rainfall seemed normal on paper, it arrived in short, erratic bursts separated by long dry spells, completely destroying the *Kharif* (monsoon) crops.
- **The Drying of the Wells:** Of the **35 open Water wells and multiple hand pumps** that the village relied upon, 33 went completely dry. The groundWater table dropped so drastically that local borewells yielded nothing but mud.

3. The Rise of "Water Refugees"

By 2018–2019, survival in Hatkarwadi became impossible. With no Water to drink, bathe, or irrigate farms, **over 85% of the village population permanently or seasonally fled**.

- Entire rows of squat concrete and mud homes were padlocked, left abandoned to bake under 45°C summer heatwaves.
- The displaced villagers migrated to faraway economic zones like Mumbai, Pune, Sangli, and Baramati, forced to survive as low-wage construction workers, taxi drivers, or seasonal labourers cutting sugarcane on large plantations.

4. Fractured Households: The Left-Behind Elderly and Children

The most heartbreaking element of Hatkarwadi's story is its social fragmentation. The harsh migration process left the village populated almost entirely by the elderly and young children:

- **The Lonely Sentinels:** Notable residents like 75-year-old Dagadu Beldar became symbols of the village's isolation. After drought forced his wife and three sons to move 400 km away to work at a sugar factory, he stayed behind completely alone in a dark one-room hut, unable to afford to move.
- **The Child Caretakers:** In many households, parents locked up the main doors and migrated to cities for work, leaving young children behind to manage the house, cook, and care for remaining livestock while attempting to attend local schools.
- **The "No-Bride" Village:** Local youth like Ganesh Sadgar noted a unique social crisis: because the village had zero Water and relied entirely on government Water tankers that arrived once every several days, families from other regions completely refused to marry their daughters to men from Hatkarwadi.

Current Status

Hatkarwadi remains a deeply vulnerable settlement. While state-backed Watershed schemes like the *Jalyukt Shivar Abhiyan* have attempted to de-silt the local streams and build check dams to trap rainWater, the region continues to experience severe climate volatility. As recently as mid-2026, severe monsoon deficits across Beed have kept local reservoirs near dead-storage levels, forcing the remaining residents of Hatkarwadi to continue to rely heavily on mobile Water tankers for absolute baseline survival.

Solution

Now that we've discussed the problems in details above, village-by-village, we also need to find out most viable, holistic and sustainable solution for restoration. Interesting point to note here is – none of the ghost villages have turned into deserts. In all scenarios nature has reclaimed. Be it wild animals or wild grasses or tree / shrubs anything. And none of them can survive in absence of Water.

This means, for sure Water is there, but not enough for human usage. That is why it is mandatory need for the human beings to understand the nature around us and build a development strategy which is in absolute harmony with nature. Now let's have a look at the Nature-based Solutions (NbS) and Ecosystem-based Adaptations (EbA) available around us.

Let's start with land restoration first. In ancient Vaidic era we had developed certain methodologies for land restoration which was documented later in **Surapala's Vrikshayurveda** (compiled around the 10th century) and older Vaidic agricultural texts, this method is described as the preparation of *Kuttima* (compost pits) or simply specialized planting pits (*Gartas*). The process involved –

- **Digging Pits:** Creating systematic pits (*hasta* or forearm-sized holes) during specific dry periods.
- **Organic Enrichment:** Filling these pits with a mixture of cattle dung (*Gomaya*), organic waste, residues, and specialized fermented liquid organic manures like *Kunapajala* to concentrate nutrients at the root zone.
- **Moisture & Microbe Activation:** Letting the organic matter attract beneficial Soil organisms (like earthworms and termites) to naturally break up the hardpan Soil and maximize rain Water infiltration.

The second natural step is to work on the Water availability. Once the Soil ecology is restored the moisture retention of the Soil gets insured. Now we need to migrate to the next steps, i.e., establishing equilibrium between Soil and Water, so that the Waterbody is able to retain the Water. Creation of perennial Waterbodies will not just ensure surface Water availability for drinking, bathing, irrigation, aquaculture and animal husbandry, but also ensure native biodiversity conservation and natural ground Water recharge.

Vaidic Srijan, a climate tech & agri tech startup from Bharat has built a host of solutions for addressing such climate vulnerabilities. All five ghost-village solutions can be drawn from the same indigenous technology stable that Vaidic Srijan has deployed across 80+ live and completed projects in Bharat. Every technology is evaluated by Vaidic Srijan against the IUCN's global definition of Nature-based Solutions and against the UN Sustainable Development Goals, summarised below.

Cownomics™ Technology — Waterbody, Spring & Wetland Revival

Resurrects native ecology in Soil, Water and Air through their conjunction points — Waterbodies, wetlands, Water channels, peatlands, streams, lakes, ponds, canals, rivers, rivulets, dam reservoirs, step wells and lagoons — to make them healthy in order to restore the 'ecosystem services' which they are naturally supposed to deliver to their respective vicinity.

SDG alignment: All 17 SDGs

Ecolining® — Anti-Drying Treatment for Seasonal Waterbodies

Purpose-built for Waterbodies that have become seasonal and are vulnerable to drying during peak summer. Uses a natural, biodegradable catalyst material to accelerate equilibrium between Soil and Water, enabling retention in freshly built or drying-prone Water structures in order to make them perennial within 8-10 months.

SDG alignment: SDG 1, 2, 3, 6, 13, 14, 15

EcoDredging® — In-situ Sludge Remediation

Developed for Waterbodies that have accumulated large sludge deposits and grown shallow over years. Enables in-situ decomposition and consumption of bottom sludge, rearranging it for plankton production and strengthening the aquatic food chain.

SDG alignment: SDG 1, 2, 3, 6, 13, 14, 15

EcoDrainR™ — Natural Drain & Channel Rejuvenation

In-situ rejuvenation of non-concretised, uncovered natural flowing channels (naula), drains, springs and even irrigation channels through shrub and hedge plantation on the embankment, keeping Water quality within safe limits, mitigating Soil erosion and extracting specific contaminants — species selection is carefully done match the native species of the said local agroclimatic zone.

SDG alignment: SDG 6 & 11

MAGICC® — Medicine for Agricultural Growth & Integrated Crop Conservation

A Vaidic Science-based sustainable agriculture practice making farms diseases, pests and weather-resilient, chemical-free and antibiotic-free, while reducing input cost and increasing yield quality and quantity. Wherein mono-cropping is forbidden and agriculture, horticulture, aquaculture, apiculture and animal husbandry operate together on the same field towards zero-waste, Zero Liquid Discharge farming.

SDG alignment: Food & Water security, livelihood creation

Evaluation Against the IUCN Global NbS Standard

The table below summarises how Vaidic Srijan's core Waterbody technologies are evaluated, feature-by-feature, against the IUCN's eight-point global definition of Nature-based Solutions — the same framework this proposal asks CSR, ESG and CER partners to apply when assessing the ghost-village rehabilitation case.

Feature	Cownomics™	Ecolining®	EcoDredging®	EcoDrainR™
Embraces nature conservation norms	✓	✓	✓	✓
Can be implemented alone or integrated with other interventions	✓	✓	✓	✓
Determined by site-specific natural & cultural context	✓	✓	✓	✓
Produces fair, transparent societal benefits	✓	✓	✓	✓
Maintains biological & cultural diversity over time	✓	✓	✓	✓
Applied at landscape scale	✓	✓	✓	✓
Balances near-term benefit against long-term ecosystem service	✓	✓	✓	✓
Integral to overall policy & design addressing the challenge	✓	✓	✓	✓

Vaidic Srijan

PEOPLE | NATURE | RESILIENT COMMUNITIES
A BRIGHTER INDIA

Restoring People Rebuilding Villages Reviving Tomorrow

LOCAL SOLUTIONS FOR A LIVEABLE PLANET

OUR AWARDS & ACCOLADES

RECOGNITION FOR A GREENER, HEALTHIER AND STRONGER TOMORROW

- Award for **Planet Hero 2026** by Earthday.org & IESA
- Global Sustainability Award 2025 for SDG 14: Life Below Water, the GOLD Award by ARC in association with TERI and Miranda House, University of Delhi
- We Serve India Awards 2025 for Innovation in Environmental Sustainability in North Zone by Forbes India, Lions Club International and Network18.
- FEFPA Green Future Award nomination 2025 by Eurasian Women's Forum (ROSCONGRESS), St. Petersburg & ROSATOM, Moscow – Russia.
- Gold Category Award for Urban Biodiversity Conservation Project of the year 2025 during 5th Good Air Summit & Awards 2025 by IHW Council.
- Best Green Initiative of the year 2025, during the 11th MSME Excellence Awards by ASSOCHAM
- Best Startup Award of the year 2025 in Uttar Pradesh, by Lucknow Management Association
- Award for Science & Technology in Water Sector 2025, by World Water Leadership Congress & Awards and World Federation of CSR Professionals.
- Innovative Development Sector Project for "Cownomics® Technology" at SABERA 2024
- BRICS Solutions Awards nomination for Climate and Environmental Technologies category
- Thematic Excellence in "Water & Sanitation" by Tata Social Enterprise Challenge 2024
- Winner of Greenovation Hackathon 2024 – ICFAI University & RE Sustainability
- Good Air Award for Best Pollution Control Project for 2024 – IHW Council
- Most Innovative New Technology of the Year 2024 – World Water Leadership Congress
- CII National Award for Excellence in Water Management 2023 – by Confederation of Indian Industries (CII) & CII's Triveni Water Institute
- Best Environmental Startup in UP - 2023 - by Startup in UP & Women Shine magazine
- ESG enabler technology of the year 2023 - by Ministry of New & Renewable Energy & India ESG Networks
- Certificate of Appreciation - 2023 - by National Institute of Disaster Management, Ministry of Home Affairs & IIT-BHU
- Certificate of Appreciation - 2023 – by Centre for Rural Development & Technology (CRDT), IIT - Delhi
- RC Mishra Nature Care Award for Best Technology for Environmental Restoration - 2023 - by Nature Care Initiative
- Technology & Implementation Partner for AMRUT 2.0 - 2022 – by Ministry of Housing & Urban Affairs (MoHUA), Government of Bharat
- Global Top 3 Author on Water Technologies - 2021 - by Smart Water Magazine, Spain
- "Idea Worth Spreading" - 2020 - by TED, USA
- 1st Water Heroes Award– October, 2019 - by Ministry of Jal Shakti

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CIMC Center for International Migration & Collaboration · GASM · Global Water Works · GWYN Global Waste Youth Network · GREEN WORKFORCE INITIATIVES TOGETHER FOR A SOSTAINABLE TOMORROW · IWA the international water association · & Fauna Flora · IPPN · IWRA International Water Resources Association · LEARNING FOR NATURE UEDP · The Biodiversity Mechanism For a Planet in Balance · iD ORCID · RIYADH ACTION AGENDA · GREENR · The Water Network · SOCIETY of WETLAND SCIENTISTS · INTERNATIONAL RIVERS people • water • life · SAIARD South Asian International Agricultural Research and Development Initiative

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