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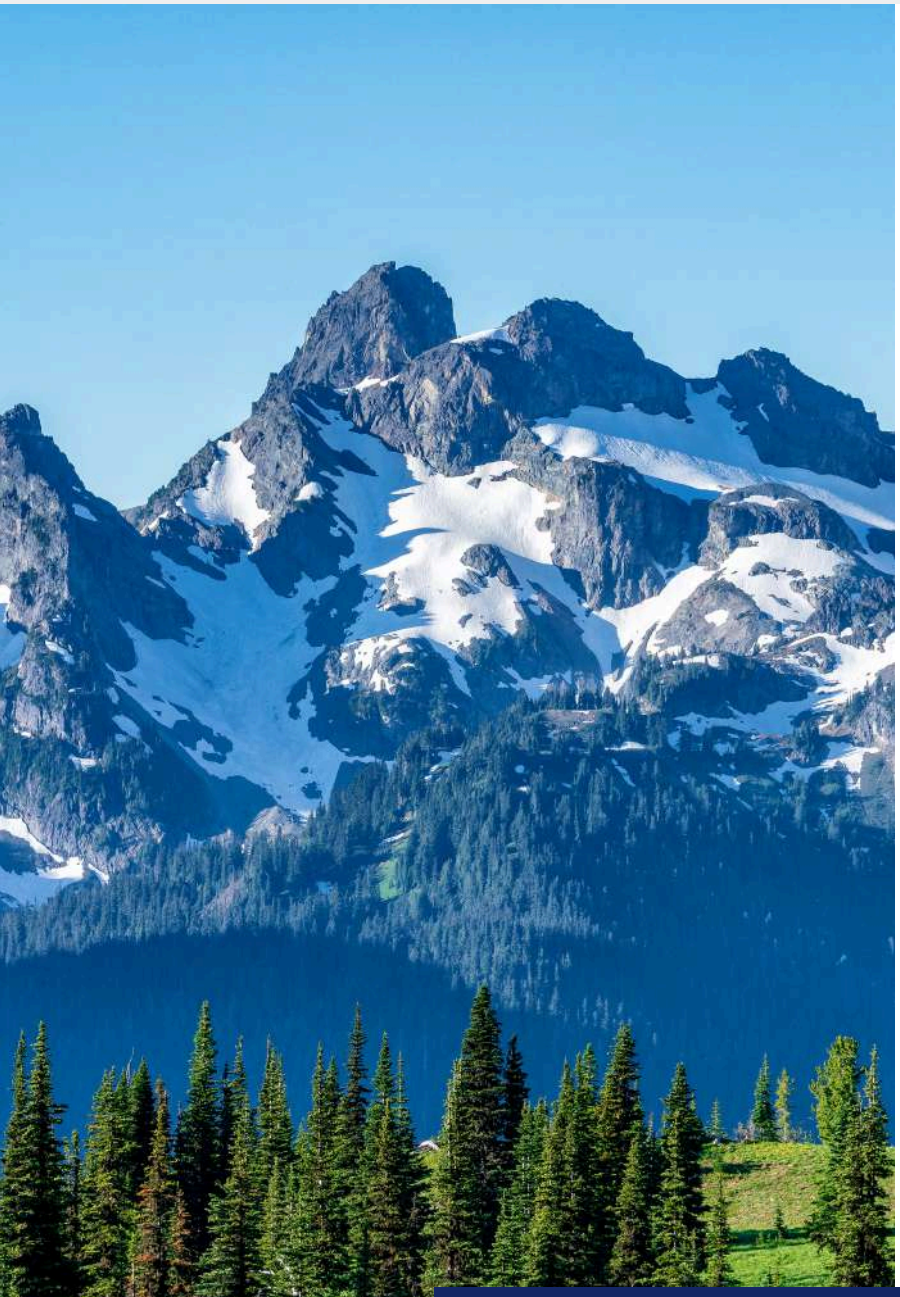
A NEW Strategy for Inclusive and Sustainable Development of Uttarakhand Based on An Analysis of the Current Status of the Environment, Society and Economy of Uttarakhand



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A NEW Strategy for Inclusive and Sustainable Development of Uttarakhand Based on An Analysis of the Current Status of the Environment, Society and Economy of Uttarakhand

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1.1 Introduction

Uttarakhand was carved out of the Himalayan part of Uttar Pradesh in 2000 to form a separate state. Among two UTs (Jammu & Kashmir and Ladakh) and two states (Uttarakhand and Himachal Pradesh), in the western Himalayan region, Uttarakhand is smallest in terms of geographical area and second in terms of population. However, its economic size is largest. Thus, it is an important state in the western Himalayan region.

The southern part of the state comprises the Tarai plains and the Bhabhar Himalayan foothills, rising to the middle Himalayas to the north. At the northern border with Tibet there are many ice-capped peaks of more than 7000 metres altitude. Uttarakhand is endowed with rich natural resources including glaciers, rivers, forests, soil and biodiversity. It has the largest forest area (24,305 sq km) in the western Indian Himalayas. These forests have a rich diversity of flora and fauna.

After the formation of the state in 2000, it commissioned big infrastructure projects especially related to hydroelectric power. Moreover, the state has also promoted industrial hubs in the plains districts of Haridwar and Udham Singh Nagar to boost economic growth. Religious tourism associated with Char Dham in the state was also boosted and now contributes significantly to the state's economy.

Despite infrastructural development in the state in the last two and half decades and sizable growth of the state economy, people in general have not benefited proportionally.

The income gap between rich and poor has further increased, unemployment is continuously on rise and more recently many incidents of social unrest and violence raises many questions. The ever increasing distress outmigration from hilly parts of Uttarakhand is manifestation of various developmental gaps, social problems and degradation of natural wealth.

1.2 The triple crisis facing Uttarakhand

In the sections following this, we show that Uttarakhand faces an environmental crisis, a social development crisis and an economic crisis, compounded by its geographical and infrastructural limitations. Each of these three crises is bad enough by itself, and the fact these are occurring together, makes the situation very complex. Yet, these need to be addressed urgently. This study is an attempt to offer some suggestions as to how to deal with these three crises simultaneously. Thus, it is not only about how to reduce unemployment, or only about how to raise the growth rate of the economy, or only how to repair the social fabric, or only how to clean the environment, but about how to deal with this complex triad of crises. Here is the brief description of three crises facing the state.

1.3 State of natural wealth and the first crisis

Uttarakhand, located in the western Himalayas, is a state rich in natural resources, including water, forests, and land. These resources are vital for sustaining the Himalayan ecosystem and supporting the livelihoods of its people. The state covers 55,483 sq km, with over 68% of its area under forest cover and 14% dedicated to agriculture, primarily in the Tarai and Bhabhar regions. Uttarakhand also receives approximately 48,352 MCM of water annually from precipitation and hosts 213 rivers and 14,000 glaciers. However, these natural assets are under significant threat due to anthropogenic pressures and climate change.

1.3.1 Water

Uttarakhand is a water-surplus state with extensive snow cover. glaciers and major river basins including the Alaknanda, Bhagirathi, Sharda, Ramganga, and Yamuna. Despite abundant water resources, challenges persist. Hydropower development has been prioritized to generate an estimated 24,551 MW of electricity annually. However, this focus on hydropower has adversely impacted aquatic biodiversity and local communities dependent on rivers for drinking water and irrigation.

Local water sources like Naula and Dhara are drying up due to deforestation and ecosystem changes. Additionally, climate change has accelerated glacier retreat, leading to disasters such as Glacial Lake Outburst Floods (GLOFs), exemplified by the Kedarnath flood in 2013 and the Vishnuprayag flood in 2021(Benjamin, 2021)[1]. Irrigation infrastructure remains inadequate; only 4.48 lakh hectares out of a potential 5.4 lakh hectares are irrigated. Similarly, drinking water supply falls short of demand in both rural (529 MLD vs. 663 MLD) and urban areas (Irrigation Research Institute, Roorkee, 2018).[2]

[1] Laurent Benjamin, Receding Glaciers Threaten Uttarakhand Residents' Electricity and Homes, Earth Refugee, April 08, 2021: https://earthrefuge.org/receding-glaciers-threaten-uttarakhand-residents-electricity-and-homes/

1.3.2 Forests

Forests cover approximately 68% of Uttarakhand's area and are integral to the subsistence of those living in the region. Historically exploited for timber during British rule, forest commercialization continues post-independence with activities like herb collection. However, invasive species like chir pine have replaced dense oak forests in many areas, altering ecosystems and drying water streams. Between 1991–2001 alone, 18.2% of oak forests were converted to chir pine forests in Almora and Nainital (Das, Arundhati, et al, 2021).[3]

Forest governance is divided between the state forest department (64%) and nominal community owned Van Panchayats (19%). While Van Panchayats manage forests better than state-controlled areas, over 55% of recorded forest land lacks proper data or planning. Dense forest area has declined by 1,200 sq km between 2001–2021 due to climate change and invasive species (ISFR, 2001; FSFR, 2021). [4]

Forest fire is yet another major challenge facing forests in Uttarakhand. Over the past two decades, forest fire incidents have soared, with just 859 recorded between 2006 and 2010, versus 36,391 between 2021 and mid-2024 (Govt of Uttarakhand, Watershed Directorate, 2009).[5] Government data also reveals that the affected area jumped from 231 hectares in 2011 to 3,553 hectares in 2021—a stark indicator of intensifying fires.

1.3.3 Land

Agriculture supports 70% of Uttarakhand's population but occupies only 14% of its land area. Land distribution is highly skewed; marginal farmers (70%) own less than one hectare each but control only 27% of agricultural land.[6] Declining soil fertility, wildlife damage (e.g., by monkeys), and climate change have reduced agricultural productivity.

Millet cultivation has declined by 46%, while food grain cultivation dropped by 27% between 2004–2023 (APEDA, 2024)[7]. Efforts to promote organic farming have shown promise; as of 2023–24, over 51,628 hectares were under organic certification.

Uttarakhand's diverse agro-climatic zones range from alluvial soils in Tarai/Bhabhar regions to sandy loam soils at mid-altitudes and clay soils at higher elevations.

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[2] Irrigation Research Institute, Roorkee, State Specific Action Plan for Water Sector, 2018, Uttarakhand: https://nwm.gov.in/sites/default/files/Report_Draft-SSAP_Uttarakhand.pdf

[3] Das Arundhati, Tarun Menon, J. Ratnam, R. Thadani, G. Rajashekar, R. Fararoda and G Shahabuddin, 2021, 'Expansion of pine into mid-elevation Himalayan oak forests: Patterns and drivers in a multiple use landscape, Forest Ecology and Management 497(2021)

[4] India's State of Forest Report (ISFR), 2001 and 2021, Forest Survey of India, Government of India

[5] Compiled from FSI: https://fsiforestfire.gov.in/index.php

[6] Govt. of Uttarakhand, Watershed Management Directorate, Uttarakhand State Perspective and Strategic Plan (2009-27), 2009. http://wmduk.gov.in/Perspective_Plan_2009-2027.pdf

[7] Agricultural and Processed Food Products Export Development Authority (APEDA), Government of India. 2024. https://apeda.gov.in/apedawebsite/organic/data.htm

However, soil fertility is declining due to nutrient loss and increased use of chemical fertilizers. Although food grain yields improved from 622 kg/hectare in 2004–05 to 958 kg/hectare in 2022–23, many farmers have abandoned agriculture due to high input costs (Joshi and Lohani, 2023).[8]

According to the 2011 Census, there were 1,048 ghost villages – that is, villages with no population – in Uttarakhand. Since then, this number is estimated to have reached close to 2,000. "Ghost villages embody the socio-economic crisis facing the state. Limited economic prospects, inadequate infrastructure and natural calamities accelerated by climate change have driven large-scale migration from the hills to the plains in the state." (Vineet Bhalla, 2024).[9]

Landslides in mountain districts especially during monsoon due to heavy rain, excessive soil erosion, degradation of vegetation and large excavation for infrastructure projects like road, railway line and hydro power project changes not only the landmass but also affect local life and livelihoods.

According to a landslide inventory prepared by The Indian Space Research Organisation, ISRO, there are 11,219 landslide inventories in Uttarakhand (ISRO, 2023).[10] Okhimath, landslide of 1998, the Kedarnath flash flood of 2013,[11] the Ice rock avalanche of Rishiganga that occurred in 2021(Kelso, 2021)[12] and the recent Joshimath land subsidence event are some examples of natural hazards within the state (Sati et al. 2023).[13]

1.3.4 Climate change

The state experiences significant temperature variations due to elevation differences. Southern regions are hotter compared to mid-Himalayan areas. Regional temperatures are projected to rise by up to 2.2°C by 2030 compared to 1970 levels (Govt of uttarakhand, 2014)[14].

Glaciers like Gangotri are retreating at alarming rates (19m/year), contributing to GLOFs such as those that caused the Kedarnath disaster (2013). Additionally, over 12% of Uttarakhand's landmass faces desertification due to vegetation loss (IIRS,2022).[15]

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[8] Joshi and Lohani (2023) Challenges of Agriculture in Uttarakhand Himalayas https://www.researchgate.net/publication/376683524

[9] Vineet Bhalla (2024) View from the Margins: Uttarakhand's ghost villages embody the state's economic challenges https://scroll.in/article/1066545/view-from-the-margins-uttarakhands-ghost-villages-embody-the-states-economic-challenges

[10] ISRO: Landslide Atlas of India- https://www.isro.gov.in/media_isro/pdf/LandslideAtlas_new_2023.pdf

[11] Sphere India SIT-REP, 2013, "Flood Incident in Uttarakhand, Situation Report https://www.sphereindia.org.in/sites/default/files/2021-08/IAC_Report_8.pdf

[12] Harper, Kelso (12 February 2021), *Miniature Satellites Reveal Cause of Deadly Uttarakhand Flood That Devastated Hydroelectric Dams*. Scientific American

[13] Sati, et al (2023) Unstable Slopes and Threatened Livelihoods of the Historical Joshimath Town, Uttarakhand Himalaya, India. Current Science Vol 124, No 12 (2023) https://www.currentscience.ac.in/Volumes/124/12/1384.pdf

[14] Government of Uttarakhand- Uttarakhand Action Plan on Climate Change, 2014: https://forest.uk.gov.in/uploads/climate_change_information/1616764235.pdf

[14] Indian Institute of Remote Sensing (IIRS), RS for GLOF/LLOF Hazards: https://ndma.gov.in/sites/default/files/PDF/Sikkim_Conclave/Session%205/IIRS%20GLOF_Mapping_Modeling_2022_SDMA.pdf

Unless reversed, in the long term, nearly all forests in Uttarakhand will experience temperature increases exceeding 5°C alongside significant rainfall departures—potentially altering ecosystems irreversibly (IFSR, 2021).[16]

Uttarakhand's natural wealth faces multifaceted challenges from climate change, unregulated development, invasive species, poor governance, and resource mismanagement.

1.4 State of social development and the second crisis

Uttarakhand's population, estimated at 1.17 crore in 2024 is culturally, religiously and ethnically highly diverse. The human development indicators of the state are comparatively better, but there exists problems in ensuring quality health, education and other basic facilities. Social discrimination based on caste, ethnicity and religion and infrastructural deprivation due to lack of basic infrastructure in rural and mountain areas manifest in a number of crises relating to society and inter-community coherence and cooperation.

For example, the overall sex ratio stands at 963 females per 1,000 males, while the child sex ratio is even more skewed at 890 females per 1,000 males. Incidents of feudal caste atrocities are still reported from various districts. The NCRB data shows that the crime against public tranquillity - including rioting, communal/sectarian violence and inciting enmity among different groups - in the state has increased from 458 in 2010 to 915 in 2022. Overall, the occurrence of such offences in Uttarakhand is 8.2 per lakh as against 4.0 per lakh as the all India average (Crime In India, NCRB, 2022, p 74 pdf).[17]

The geographical difference has also contributed to deprivation in the last few decades. The Palayan Aagyog constituted by the Uttarakhand government in 2018 with the purpose to understand distress migration from mountain districts observed that a very high out migration is happening from hill districts in search of livelihood, better education and health facilities.

1.4.1 Health

The NFHS-V[18] report reveals that NNMR, MMR and U5MR is as high as 32,39 and 45 respectively. Rural areas report higher infant mortality rates (43 per 1,000 live births) compared to urban areas (32 per 1,000 live births). Children's nutritional status in Uttarakhand has improved since NFHS-4[19] by all measures.

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[15] Indian Institute of Remote Sensing (IIRS), RS for GLOF/LLOF Hazards: https://ndma.gov.in/sites/default/files/PDF/Sikkim_Conclave/Session%205/IIRS%20GLOF_Mapping_Modeling_2022_SDMA.pdf

[16] India's State of Forest Report (ISFR), 2021, Forest Survey of India Government of India https://fsi.nic.in/isfr-2021/chapter-11.pdf

[17] Govt of India, National Crime Records Bureau, Crime in India, 2022 https://www.ncrb.gov.in/uploads/nationalcrimerecordsbureau/custom/1701607577CrimeinIndia2022Book1.pdf

[18] National Family and Health Survey (Round -5), State Report Uttarakhand. Indian Institute of Population Studies, Government of India, 2021

[19] Government of India, Ministry Health and Family Welfare, 2022, Rural Health Statistics- 2021-22, https://mohfw.gov.in/sites/default/files/RHS%202021-22_2.pdf

Percentage of children who are stunted decreased from 34% to 27% in the four years between NFHS -4 and NFHS -5. The percentage of children who are underweight, decreased from 27% to 21% and the percentage of wasted children decreased from 20% to 13% in the 4 years from NFHS-4 and NFHS-5. However, the continuing of undernutrition remains a major public health problem among under-five children in Uttarakhand.

Moreover, there is high prevalence of anaemia among children and women and very low coverage of ante-natal and postnatal care for pregnant and lactating mothers. As many as 59% of the children below 5 years, and 43% of women were anaemic as per NFHS-5. Even 15% men were anaemic, indicating widespread dietary deficiencies.

On the positive side, the occurrence of diseases like malaria and tuberculosis has come down over the years. On the other hand, with the rise in urbanisation and sedentary lifestyles and dietary changes, there is a rise in non-communicable diseases such as hypertension, cardio-vascular disease, diabetes and cancer. 14% women and 26% men of age 15-49 had hypertension.

Similarly, 13.8 % women and 16.6% men of age 15-49 reported diabetes. The prevalence of cancer, however, was reported at low levels but this may also be due to lack of screening facilities.

Health care institutions in Uttarakhand are persistently facing a huge shortage of medical and paramedical staff. According to rural health statistics- 2021, 75% position of specialist doctors in CHCs are vacant. Similarly, nearly 70% of the positions of lab technicians and 38% of nursing staff at PHCs and CHCs are vacant in the state. The shortage of medical and paramedical staff is clearly reflected in the health outcomes of Uttarakhand.

The Palayan Aagyog report suggests that nearly nine per cent people are migrating because of poor health facilities in their villages. This proportion is even higher in remote districts such as Chamoli, Pithoragarh and Pauri.

Apart from basic healthcare facilities such as maternal and child health, the state is also facing challenges related to increase in cases of non-communicable diseases and life-style diseases. The NFHS-V report suggests an increase in cases of such incidents.

The shortage of healthcare professionals further hampers service delivery; for instance, there are only 52 specialist doctors against the required 212 in CHCs statewide. Urban districts like Dehradun enjoy better healthcare facilities compared to remote regions like Chamoli, where home deliveries are common due to limited access to institutional care. This disparity is reflected in health outcomes:

1.4.2 Education

Uttarakhand has made progress in education but faces persistent challenges. The state boasts a literacy rate of 87.6% as of 2021; however, gender disparities persist, with male literacy at 92.1% compared to female literacy at 82.2%. While gross enrollment ratios in higher education are above the national average at 33%, they lag behind states like Tamil Nadu and Delhi.

Despite high enrollment rates, educational outcomes remain poor. The Annual Status of Education Report (ASER) 2022 reveals that many children struggle with basic reading and arithmetic skills. "Children in Std III, "9% cannot even read letters, 23.9% can read letters but not words or higher, 18.4% can read words but not Std I level text or higher, 21% can read Std I level text but not Std II level text, and 27.7% can read Std II level text. For each grade, the total of these exclusive categories is 100%."

Rural schools face acute shortages of teachers and infrastructure; approximately 16.67% of teaching positions in primary and upper primary schools remain vacant, disproportionately affecting remote districts where educational resources are already scarce. Digital learning initiatives like E-Vidya aim to bridge gaps in access but have yet to address fundamental issues such as poor student-teacher ratios and inadequate school facilities.

Educational institutions are either not adequate in hilly districts of the state or they are understaffed with lack of facilities. Uttarakhand has 11 state funded universities but only three universities are in Hilly districts (two in Tehri and one in Almora), most of these universities are in Dehradun/Haridwar, Udham S Nagar and Nainital districts.

Gender inequality compounds these challenges. Female labor force participation (FLFP) is strikingly low at just 23.7%, compared to male participation at 71.2%. Traditional gender norms and limited access to education hinder women's economic empowerment, particularly in rural areas where dropout rates for girls are significantly higher than in urban areas.

1.4.3 Institutional challenges

Uttarakhand's social development trajectory reflects both progress and persistent challenges. While strides have been made in improving literacy rates and healthcare access through government initiatives, significant gaps remain in addressing regional disparities, gender inequality, and institutional shortcomings. Bridging these divides will require sustained investment in infrastructure, human resources, and policy reforms tailored to the unique needs of rural communities across the state's diverse landscape.

Community-based organizations (CBOs) are few and are often not involved by the authorities in implementing local development projects. This lack of coordination undermines initiatives aimed at improving infrastructure, education, and healthcare services across the state.

The Van Panchayat system in Uttarakhand is yet another institutional mechanism to govern community forests. Established in the 1930s in response to the demand of the local hill people to usufructuary rights for fuel and fodder, these institutions are also facing problems due to their functional limitation and shortage of finances. This institution has been gradually reduced to a subordinate agency of the state forest department.

Panchayats and municipal bodies are important institutional mechanisms to ensure participation of people in governance. But both institutional mechanisms are under-funded and deprived of functional autonomy. According to a World Bank report from 2023, nearly half of Panchayats lack sufficient resources for community-driven initiatives. This institutional weakness is particularly problematic in hilly districts where infrastructure deficits are acute.

1.5 State of the economy and the third crisis

The economy of Uttarakhand is a diverse mix of agriculture, industry, and services, shaped by its unique geography and natural resources. The Gross State Domestic Product (GSDP) for 2023-24 reached approximately ₹3.25 lakh crore, growing at a compound annual growth rate (CAGR) of 8-9% over the past decade. The service sector dominates the economy, contributing 55-60% of the GSDP, followed by industry at 30-35%, and agriculture at 10-15%.

Agriculture in Uttarakhand faces challenges due to limited arable land, with only 14% of the state's terrain suitable for cultivation. This has led to a focus on horticulture, floriculture, and organic farming. Livestock farming forms an integral part in the economy of the Uttarakhand Himalaya and plays an important role in the mixed crop farming system. The state has a potential of milk production because of availability of fodder as a form of extensive grasslands, which are locally known as bugyals or kharaks and fodder trees particularly oak known locally as banj. Despite its small contribution to the GSDP, agriculture and livestock rearing employs nearly half the workforce, highlighting a significant employment-output disparity.

Image Source

The industrial sector contributes 30-35% to the GSDP and includes manufacturing, construction, and utilities. Industrial hubs like Haridwar and Rudrapur benefit from Special Economic Zones (SEZs) and proximity to the National Capital Region (NCR). However, logistical issues such as inadequate transport infrastructure and power supply hinder growth.

The services sector is the largest contributor to Uttarakhand's economy, driven by tourism, education, and healthcare. Tourism attracts over 40 million visitors annually and supports local businesses. However, the heavy reliance on tourism makes the economy vulnerable to disruptions like pandemics or environmental challenges.

1.5.1 Income and employment

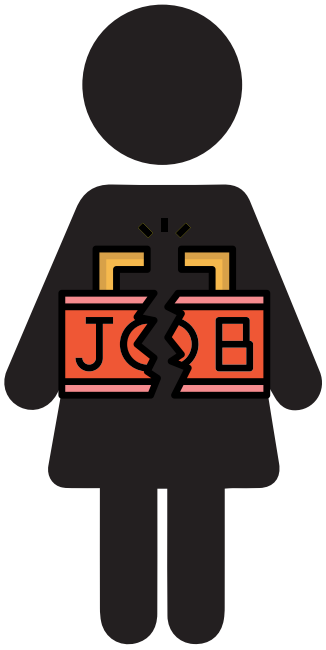
Uttarakhand's per capita income (PCI) was ₹2,02,895 in 2019-20, higher than the national average but growing slower than other states. The Multidimensional Poverty Index (MPI) has improved from 0.058 in 2015-16 to 0.041 in 2019-21, reflecting progress in poverty alleviation.

Uttarakhand's Labour Force Participation Rate (LFPR) stands at 46.2%, with higher female participation in rural areas due to dependence on agriculture. However, urban female LFPR remains low at 18.6%. Employment distribution shows a slow transition from agriculture to industry and services.

The primary sector employs 47.23% of the workforce but contributes only 9.32% to GSDP. The secondary sector accounts for 52% of GSDP yet employs only 21.83%. The tertiary sector has grown substantially but has not created enough jobs to match its economic output.

Urban centers like Dehradun benefit from industrialization and diversified employment opportunities, while rural regions remain dependent on subsistence agriculture. Over 60% of rural households rely on agriculture for their livelihood, but low yields due to challenging terrain perpetuate poverty cycles in districts like Chamoli and Tehri Garhwal.

As per the Periodic Labour Force Survey (PLFS)[20] data, unemployment decreased from 7.8% in 2021-22 to 4.5% in 2022-23 but remains higher than the national average of 3.2%. Urban unemployment is higher at 9.2%, compared to rural areas at 4.8%. Gender disparities persist, with female unemployment consistently higher than male unemployment. However, PLFS tends to underplay unemployment as it is based on those who are in the labour force (willing and able to work) but are not in the workforce (employed) . But as we stated above the LFPR is only 46.2% and for women as low as 18.6%.



[20] NSSO, 2024, 'Periodic Labour Force Survey (PLFS), NSSO, Government of India. https://www.mospi.gov.in/sites/default/files/publication_reports/AnnualReport_PLFS2023-24L2.pdf

So, we look at an alternative measure – persons between the ages 15 and 29 years who were not in employment, education or training (NEET). As per the Comprehensive Annual Modular Survey (CAMS)[21] of the NSSO 2002-23, the percentage of persons between the ages 15 and 29 years who were not in employment, education or training (NEET) was 11.1% for rural men, 50.6% for rural women, making up an overall 29.6% for rural Uttarakhand.

In urban areas 5.5% of the males, 46.2% of the females, making up an overall 24.0% of persons between the ages 15 and 29 years. Combined for rural and urban Uttarakhand, 9.7% males (one in 10) and 49.5% females (1 in 2) making up an overall 28.2% of persons between the ages 15 and 29 years were not in employment, education or training (NEET). The fact that in terms of enrolment in secondary and college education, girls are ahead of boys whereas in the entry into employment, only 50% of educated young women get work, while about 90% males do get work, shows the extent of gender disparity in employment and its consequences on women's empowerment.

Regular wage earners have the highest average monthly income at ₹23,452 but face significant gender disparities; women earn less than men across all categories.[22] Self-employment is prevalent among women but generates lower incomes compared to men.

Image Source

[21] Comprehensive Annual Modular Survey (CAMS)# of the NSSO 2002-23 CAMS Report_October_N.pdf

[22] Periodic Labour Force Survey, 2023-24 https://dge.gov.in/dge/sites/default/files/2024-10/Annual_Report_Periodic_Labour_Force_Survey_23_24.pdf

1.6 NEW strategy to address the triple crisis of Uttarakhand

Uttarakhand was carved out of Uttar Pradesh in 2000 after a long movement for a separate hilly state that can address unique developmental challenges of the region. The assumption was that in the undivided Uttar Pradesh, 11 Himalayan districts are not adequately represented. Moreover, their geographical and cultural peculiarities are not well addressed in the policy making. While there were questions of economic sustainability of these eleven districts as separate states, yet people asserted their demand and argued that business as usual is not the answer for their development.

A famous slogan of the Uttarakhand state movement was – *'Koda-Jhangora Khayenge, Uttarakhand Banayenge'* (We will eat Koda-Jhangora (local grains), and create the state of Uttarakhand). This slogan was deeply embedded in the local subsistence and future aspirations of deprived people of mountains. Moreover, it was an alternative to the dominant economic model in the country.

Reflecting on the prominent slogan of the statehood movement of Uttarakhand, we observe that no genuine attempt was made by successive state governments to realize it to present an alternative to the nation. After the formation of the state, physical development dominated state policy making and developmental projects. A lot of focus was given to construct large infrastructures in mountains including Hydro Power Projects, Highways and Railways. Moreover, tourism and pilgrimage was promoted without assessing the carrying capacity of mountain landscapes and religious places. Essentially, policy making shifted from Lucknow to Dehradun without any alteration and modification. In fact the execution of BAU accelerated due to its smaller state.

Uttarakhand is the youngest state in the entire Himalayan region. It had a lot of scope to present a new and sustainable model of development after learning lessons from other Himalayan states. However, that did not work. The physical development approach has not met the aspiration and developmental requirements of the population. The census data in 2011 and survey of Palayan Aayog in 2018 reveals that the distress migration especially from mountain districts has significantly grown in the last two decades.

The physical development approach in the last two and half decades has adversely affected the rich natural wealth (Jal, Jangal, Jameen and Jalvayu), social capital and the economy. While sectoral experts and policy makers working in watertight boundaries see them as three challenges, they are well connected and interrelated. The macro-economic development of the state – such as Gross State Domestic Product, Per Capita Income and growth of secondary and tertiary sectors shows a steady upward growth. However, data related to unemployment, poverty, access to health care, quality of education, declining forest richness, drying of rivers and streams and increasing barren land in the state reveals a wide gap between macroeconomics and quality of life in the state. Such gross mismatch is on the one hand increasing resource gap between rich and poor and on the other hand creating social unrest and disharmony.

The movement for Bhu-Kanoon (strong law to protect land in Hills) a couple of years ago in the state is an example of manifestation of social, economic and ecological crisis. The natural wealth on which Uttarakhand used to admire is slowly degrading due to a number of anthropogenic and climatic factors.

The degradation of forests, drying of rivers and streams has adversely affected local subsistence such as agriculture and animal husbandry. Moreover, no other sector has evolved in the last 2-3 decades where jobs were created to accommodate people who were engaged in agriculture. The land which is owned by locals is no longer remunerative to them. However, people from outside of the state with huge financial capital are able to buy these lands and run profitable businesses such as hotels. These situations create helplessness amongst local populace which then manifest in terms of religious, caste and gender based violence.

Thus, our proposed strategy puts Nature regeneration as the topmost priority. This means ensuring conservation of the sources of water – glaciers, upper reaches of river basins, intermediate spring sheds, mid altitude watersheds, and groundwater aquifers near the foothills and in valleys. It also means efforts to increase the area under tree cover and regenerate the dense forests. At the same time, pastures and grazing lands will have to be restored to support animal husbandry. Soil will require restoration of humus content, organic carbon and nutrient balance, which has been disturbed by the increasing use of chemical fertilisers and intensive farming.

Social development is our second priority– both as it affects individuals – through nutrition, health, education and vocational training; and as it enables collaboration among individuals through building trust and cohesion, and formation of a large number of local community groups and voluntary associations. Only when citizens learn to work in these together can the representative institutions all the way from panchayats in rural areas to municipalities, zilla parishads (district councils) and the state assemblies, can offer good governance or suraaj.

Economic development is the third priority which focuses on Well-th creation, by meeting local demand, by entrepreneurs who set up and run such enterprises and availability of credit and inputs and infrastructure. Taken together, Nature regeneration, Enabling social development, and Well-th creation, or the NEW strategy will lead to Hara Bhara Suraaj – inclusive and sustainable development with good governance in Uttarakhand.

1.7 Methodology and Outline of the report

This study is an attempt to discuss inter-linkages of environmental, social and economic crises of Uttarakhand under the current developmental approach. Further, it provides an alternative developmental approach called – the NEW Strategy to comprehensively address ecological, social and economic challenges. This strategy stresses that in order to achieve sustainable, inclusive and just well-being of people in Uttarakhand, integrated interventions are required.

Through this study we offer coining and defining of two new terms to develop a discourse of alternative developmental approach in the western Himalayan region of India. These terms are- the Triple Crisis and NEW Strategy.

The triple crisis is the simultaneous occurrence of economic dualism with an increasing wealth gap between the top 10% and bottom 90% population, breaking down of society at individual, family and community level and finally degradation of environment and natural wealth. They themselves are huge challenges in themselves but interconnectedness of these challenges and incrementally worsening of each of these challenges makes the crisis bigger and complex.

The NEW strategy is another term coined to describe philosophy and direction of an alternative development that not only address the triple crisis but also ensure more sustainable, equitable and just growth. We call this growth strategy Nature-regenerating, Enabling human, social and institutional development and Well-th (well-being not just income) enhancing, which makes the acronym NEW. As against the "business as usual" (BAU) strategy, which is exploitative of both nature and human beings, the new strategy nurtures both nature and human beings.

The other contribution of this study is to do macro financial planning for execution of the NEW strategy as an alternative to the current approach. Under the three focused sectors, we have identified areas of interventions. Using secondary data, peer-reviewed research, government estimation and insights from subject experts we have estimated both the scale of intervention and estimated cost thereof. None of the unit cost estimation presented in this report is proposed by us.

In fact, we collated a range of estimates carefully calculated by government agencies and independent researchers. For example, both the number of interventions and estimated cost for restoration of water bodies have been borrowed from the two documents of Government of India namely- census of water bodies and master plan for artificial recharge to groundwater.

This study does not stop by estimating cost for the NEW strategy, but it also assesses economic, ecological and livelihood benefits if the NEW strategy is implemented. This calculation is based on available methods adopted by various government schemes in India and interactions with experts and academicians.

For example the MGNREGA scheme was reviewed to assess the labour, operational and material cost to calculate estimated numbers of jobs to be created in implementing interventions related to regeneration of nature.

Using the experience of experts and collation of field insights along with assessment of household consumption data in Uttarakhand, the study also identifies five different sources of funds for investment. It includes, individual, community, financial institutions, voluntary sectors, corporate giving, climate finance and government funds.

Overall, this study has used both qualitative and quantitative data collection and analysis. Project team conducted field work and used methods such as observations, unstructured interviews and focus group discussion to understand the current situation of environment, social development, economy and livelihoods.

Further, the project team also carried out desk research to analyze peer reviewed research articles, official reports and surveys conducted by various agencies such as NSSO in Delhi and Palayan Aayog in Dehradun.

Chapter-1 (The Triple Crisis of Uttarakhand) sets the background for the report, discusses rationale of the study by briefly discussing the state of environmental, social and economic crisis of the state. Details of each of these challenges are in appendix-1, appendix-2 and appendix-3 (Chapters 6, 7 and 8) respectively. Moreover, this chapter also defines new concepts used in this study such as the triple crisis and the NEW strategy along with details on methodology used.

Chapter-2 (NEW Strategy for Sustainable Development) is macro financial planning of various interventions identified in three sectors namely environment, social development and economic development. This study report involves a lot of qualitative analysis and calculation. Analytical tables in this chapter give estimates required intervention to regenerate the natural environment, enhance social development and well-th creation for economic development in Himachal Pradesh.

We explain the intervention in the first column of each row, followed by the extent to which it is required in the corresponding units, the investment needed for regeneration/ rebuilding efforts for each unit of intervention, and thus the total investment needed in INR crores in 2024 prices.

Chapter-3 (Level of Investment required, Its Benefits and Sources) give a summary of investment required under three major heads namely Nature regeneration, Enabling social, -human and institutional- development and Well-th creation, that word being spelled as such deliberately to underline the well-being rather than the material aspect of wealth.

Moreover, this study also estimates economic benefits from all types of investment in terms of jobs and employment. These calculations are based on average wage components under different categories and Incremental Capital Output Ratio (ICOR).

The environmental benefits are also estimated based on the extent of carbon dioxide that will get sequestered or GHG emissions that will be reduced. These are based on authoritative estimates by different experts. We call these AMSERs - Aggregated Micro credits for carbon Sequestration and Emission Reductions. We assume that a certain percentage of these can be sold in the global carbon markets to raise funds for the proposed intervention.

Based on sectors for investment and type of intervention, we have estimated the share of investment across different stakeholders including individual citizens, government, philanthropy, CSR and banking and financial institutions. Table in Chapter-3 summarizes the source of investment based on these careful assumptions supported by fieldwork insights and experiences of domain experts.

Chapter 4 is a call to action to five levels of stakeholders:

- Individuals by themselves; as citizens, as activists, as thinkers and influencers
- Individuals by joining local community Social Groups; and by individuals joining organised NGOs/Civil Society Institutions
- Gram Panchayats/Zilla Parishads/Town Wards / Municipalities
- State and Central Government departments and specialised agencies
- International Cooperation at the Regional and Global level

Chapter 5 gives the main Conclusions of the Study.

2 NEW strategy for sustainable development

It is evident that the economic growth of Uttarakhand in the last two and half decades has not led to improving social, economic and ecological well being. Moreover, the increasing unemployment/under-employment in the state, rapidly depleting natural wealth and increasing social unrest, leads one to question its sustainability.

Based on this observation, we propose a radically new strategy for addressing these. The normal strategies put macroeconomic GDP growth first, then worry about human development and well-being, and finally pay some residual attention to environmental aspects. We assert that the triad of employment crises requires us to adopt a radically different developmental strategy, which reverses the normal economic priorities. We need to put nature first, then human beings and then GDP growth.

2.1 An overview

We call this growth strategy Nature-regenerating, Enabling human, social and institutional development and Well-th (well-being not just income) enhancing, which makes the acronym NEW. As against the current strategy, which is exploitative of both nature and human beings, the new strategy nurtures both nature and human beings, through the following three prongs:

2.1.1 Nature regeneration

Invest in regenerating nature and conserving the environment: jal, jangal, jameen and jalvayu (land, forests, water and the climate) need to be regenerated, for reviving the agriculture and allied sectors.

New green activities such as generation of renewable energy, recycling of waste, and climate-change adaptive construction and services, eco-tourism, etc. will have to be taken up in a big way. These will lead to the setting up of many nature-care enterprises.

2.1.2 Enabling Social - Human and Institutional - Development

To generate more wellbeing for all species, we need to focus on services that carry out nature conservation and sustainable use, including agricultural and livestock extension services which teach sustainable practices. We also need to adopt a new paradigm of human development services – health services need to focus on nutrition and wellness instead of medical treatment. Education services need to focus on lifelong learning instead of cramming or tuition for passing exams and tests.

Social welfare services need to focus on increasing social cohesion and capability for local participatory governance instead distributing doles to poor and the destitute. Financial services need to serve a human purpose first, and then worry about returns on shareholders' capital, which no doubt they should get. Police and Justice Delivery services need to serve the citizens and not the political masters or criminal elements.

2.1.3 Well-th creation through entrepreneurship

Marginal and small farms as well as micro enterprises need to be upgraded into DECI farms and firms. DECI, pronounced "desi" farms and firms are local Demand based, led by Entrepreneurs emerging from collectives such as self-help groups, Capitalised well and have adequate Input linkages and Infrastructure. The small percentage of larger farms and firms also need to grow in size and employment, becoming MESO farms/firms.

Image Source

MESO pronounced "mee-so" stands for farms and firms which target Metro and Export demand, are led by Socially, Ethically and Environmentally Responsible (SEER) Entrepreneurs and have Skilled workers and are supported by an Organised Eco-system. This twin upgradation – from micro to DECI and from small to MESO will create crores of new generation jobs in agricultural, livestock, renewable energy, manufacturing, construction, and well-being service enterprises.

We deal with these three headings one by one. In each, we recommend certain interventions and estimate the extent to which these are needed and the unit investment cost. Then using assumptions about incremental capital output ratio (usually assumed to be 4:1, that is Rs 4 crore of investment would yield Rs 1 crore of output) and the wage share of output (usually 25-40%), we estimate the additional output (GDP) that will be generated as well as the additional employment.

We also pay attention to the environmental aspects and compute the extent of carbon dioxide that will get sequestered or GHG emissions that will be reduced. These are based on authoritative estimates by different experts. These Aggregated Micro credits for carbon Sequestration and Emission Reductions. (AMSERs) can be sold in the global carbon markets to raise funds for the proposed intervention.

2.2 Nature regeneration- Jal, Jangal, Jameen and Jalvayu

Uttarakhand and its more than one billion peoples are endowed with rich natural resources that include 38,000 sq km forest land, 6.20 lakh hectare agricultural land, 1400 glaciers, more than 10% of its geographical area under permanent snow cover, amazing landscape and biodiversity. This huge natural wealth has been the basis of the lives of all in Uttarakhand. Moreover, it provides direct livelihoods to 47.23% workers in the state.

This component of the strategy - regeneration of nature (note we do not call them natural resources, which is a narrow anthropocentric view) -water, forest and land/soil (Jal, Jangal, Jameen), and Jalvayu (climate), of course requires major public investments. We describe first what interventions are suggested by experts, to regenerate the water sources, the forests and the land and soil, and through this mitigate or adapt to the effects of climate change. Then we indicate the extent to which these works need to be undertaken, what these would cost and what employment and environmental benefits these would bring. The details of this are discussed below and then given in tables in each section.

2.2.1 Water

Uttarakhand has huge water resources in the form of glaciers, snow-belt, perennial rivers, lakes and underground water aquifers. However, due to forest degradation and climate change all these water sources are facing great threats. Most water streams/springs in mountains have dried up. Moreover, erratic rainfall, extreme weather conditions and vegetation degradation has increased surface runoff leading to low groundwater recharge. Glaciers are also melting due to increase in temperature. Many villages in mountains especially in Pauri Garhwal, Tehri and Almora districts are already facing water scarcity. Therefore, there is an urgent need to revive these water sources in order to sustain life and livelihoods in the state.

The interventions proposed for surface water conservation are:[23]

- River rejuvenation - river basin-based soil conservation and water management to prevent erosion, and building small dams on rivulets,
- Restoration of defunct and damaged water bodies
- Spring shed restoration

For groundwater the interventions recommended are;[24]

- Contour Trenches
- Check Dams
- Percolation Tanks
- Chal-Khal
- Rooftop rainwater harvesting structures

[23] Government of India, Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation (GoI-MJS, 2023). All India report of first Census of Water bodies. https://jalshakti-dowr.gov.in/document/all-india-report-of-first-census-of-water-bodies-volume-1/

We explain the intervention in the first column of each row, followed by the extent to which it is required in the corresponding units, the investment needed for regeneration/ rebuilding efforts for each unit of intervention, and thus the total investment needed in Rs crores,[25] in 2024 prices.

The table below provides estimated expenditure, employment and environmental benefits from restoration of water sources in the state.

Table 1: Estimates for Regeneration of Water Commons

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Surface water conservation				
River rejuvenation - treatment of river basin other than forest area	Sq kms	23,483	25,00,000	5,871
Restoration of defunct water bodies	Numbers	725	10,00,000	73
Restoration of damaged water bodies	Numbers	2,371	5,00,000	119
Monitoring and Research on Glaciers and Expansion of Glacial Lakes			50,00,00,000	50

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Groundwater Recharge				
Contour Trench	Numbers	4,275	15,000	6
New Check Dams	Numbers	2,870	30,000	9
New Percolation Tanks	Numbers	810	7,000	1
Chal-Khal (traditional water sources) revival using women's self-help groups and MGNREGA funds	Numbers	2,025	15,000	3
Springshed Restoration	Number	594	3,00,000	18
Regeneration of Water Commons				6,148

[24] Government of India, Ministry of Jal Shakti, Department of Water Resources, Central Ground Water Board Master Plan for Artificial Recharge to Groundwater In India – 2020 https://jsactr.mowr.gov.in/Public_Dash/download/Master%20Plan%20to%20GW%20Recharge%2020 20.pdf

[25] As this paper is written for participation in wider Indian public discourse, for numbers we have used lakhs (100 thousand) and crores (10 million). One million is 10 lakhs and One billion is 100 crores. Miraculously, East meets West at a trillion, which is the same as one lakh crore.

2.2.2 Forests

Forest is the backbone of Uttarakhand mountain ecology and a nature-driven economy. The entire primary sector which employs around 47% of the labour force is indirectly dependent on forests. Over the years drastic changes were observed in the quality of forest in Uttarakhand. A very large area of the recorded forest is either categorized as open forest or moderately dense forest. The degradation forest has further enhanced the rate of soil and land degradation and desertification. Changing ecosystem of forests and impact of climate change has also intensified incidents of forest fires in the state.

To sustain rural livelihoods and increase jobs in rural areas, restoration of open and degraded forest is highly important. The main interventions planned in the forest under the Forest Department are

- Regreening of Open/scrub forest land through agroforestry and planted forests
- Restoring Moderately Dense forest forests - mainly through assisted natural regeneration

In addition to the above, there will be efforts to increase the green cover on wastelands and in village scrub lands and that has been covered under the Land section later. The table below provides estimated expenditure required, and the employment and environmental benefits from regeneration of forests in the state.

The successful experience of Eco-Task Force regreening of Mussoorie hills which were denuded due to limestone mining needs to be replicated. (Ecological Territorial Army, 2024)[26] We are recommending the creation of Eco-Task Force like formations comprising of local people to make this into a widespread people's movement.

Forest fires pose a serious threat to Uttarakhand, damaging thousands of hectares each year. Official sources cite four primary causes: intentional fires, agricultural practices, accidents or negligence, and rising temperatures[27](GoU, 2023). Studies of oak forests in the regions observed that overuse of forests in presence of forest fire has now expedited invasion of Chir Pine (Pinus Roxburghii). Pine forests are relatively dry and prone to forest fires.[28](Das et al, 2021),

[26] Ecological Territorial Army (2024) https://territorialarmy.in/page/11

[27] GoU, Forest Department, 2023, Field Manual, State Forest Department, Government of Uttarakhand, India

[28] Das Arundhati, et al, "Expansion of pine into mid-elevation Himalayan oak forests: Patterns and drivers in a multiple-use landscape", Forest Ecology and Management, 497 (2021) 119491

Table 2 Incidents of Forest Fires in Uttarakhand

Year Range	No. of Fire Incidents
2006-2010	859
2011-2015	1,982
2016-2020	18,246
2021-2024 (till May 15)	36,391

(Source: Compiled from FSI: https://fsiforestfire.gov.in/index.php)

Over the past two decades, forest fire incidents have soared, with just 859 recorded between 2006 and 2010, versus 36,391 between 2021 and mid-2024. Government data also reveals that the affected area jumped from 231 hectares in 2011 to 3,553 hectares in 2021—a stark indicator of intensifying fires.

We are recommending the constitution of local Forest Fire Protection Committees to involve the local people in this important task.

Table 3 Estimates for Regeneration of Forest Commons

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Regreening of Open/scrub forest land through agro-forestry and planted forests by Eco-Task Force type of formations comprised of local people	Lakh Hectares	6.9	94,187	6,499
Restoring Moderately Dense forest forests - mainly through assisted natural regeneration	Lakh Hectares	17.8	51,326	9,136
Forest fire Control Measures in Fire prone forests and formation of local Forest Fire Protection Committees	Lakh Hectares	253	200	506
Regeneration of Forest Commons				16,141

2.2.3 Land and Soil

Landslides in mountain districts especially during monsoon due to heavy rain, excessive soil erosion, degradation of vegetation and large excavation for infrastructure projects like road, railway line and hydro power project changes not only the landmass but also affect local life and livelihoods. According to a landslide inventory prepared by ISRO, there are 11,219 landslide inventory in Uttarakhand (ISRO, 2023).[29]

The decreasing soil productivity has burdened small and marginal farmers of Uttarakhand to rely on ever increasing agricultural inputs such as seeds and fertilizers. Moreover, records show that in the last two decades the agricultural productivity has remained stagnant especially for food grains and fruits.

Over the years, the local consumption of food has increased due to increase in population. Further the increasing labour force is further accommodated by the same agricultural land with stagnant productivity.

Agriculture has become very unsustainable. Therefore, more innovation in agriculture is required to meet local consumption demand and job aspiration of young people. Such demand requires restoration of land and soil in the state as a prerequisite, particularly for land affected by water erosion.

In addition, all the agricultural land, whether single cropped or multiple cropped, needs restoration of soil organic carbon and microbial life.

The table below provides estimated expenditure required for regeneration of common and private lands in the state and the employment and environmental benefits therefrom.

Table 4 Estimates for Regeneration of Land - Common and Private

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Treatment of land affected by water erosion using MGNREGA funds	Hectares	11943	30,000	36
Restoration of soil nutrients in single cropped land		594000	10,000	594
Restoration of soil nutrients in multiple cropped land		375000	25,000	938
Regeneration of Land - Common and Private				1567

[29] ISRO: Landslide Atlas of India- https://www.isro.gov.in/media_isro/pdf/LandslideAtlas_new_2023.pdf

2.2.4 Jalvayu parivartan – Climate change

Climate change is impacting the lives and livelihoods of people in Uttarakhand. Some of the clearly visible drastic impacts of climate change are moving apple orchards to higher altitudes, early flowering of oak, retreating of glaciers just to indicate. On the other hand, tourism is getting disrupted due to erratic weather. Thus, the regeneration of nature will do all-round good to Uttarakhand. The interventions in Jal, Jangal Jameen mentioned above will collectively help mitigate the adverse effects of Jalvayu Parivartan. This is summarised in the table below.

Table 5 Estimates for Regeneration of Water Commons

Interventions Proposed	Total Investment Over Five Years (INR crore in 2024 prices)	Additional GDP pa due to this investment after 5 years (in INR crore at 2024 prices)	Employment in person years on an ongoing basis after 5 yrs	Additional Wage Income for the state after Investment Period Rs cr pa	Average wage or earning per worker in Rs lakh pa in 2024 prices	AMSERs in Rs Crore per annum
Regeneration of Water Commons	6,148	1,664	38,390	998	2.60	4,649.3
Regeneration of Forest	16,141	3,909	1,07,771	2,802	2.60	622.4
Regeneration of Land - Common and Private	1567	392	12,056	313	2.60	83.2
Nature Regeneration	**23,856**	**5,964**	**1,58,217**	**4,114**	**2.60**	**5,354.9**

AMSERs = Aggregated Micro-carbon-credits for Sequestration and Emission Reductions

2.3 Enabling Human, Social and Institutional Development

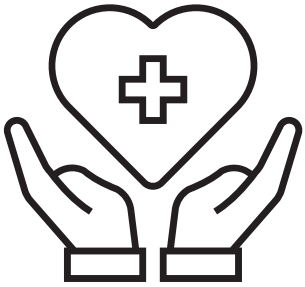
The dominant systems of economic development have created deep divides between haves and have not. The economic inequality created by the current developmental approach has further affected health, nutrition, education, livelihoods, and overall well-being of people in general. Often these inequalities and deprivation manifest in the form of social conflicts and violence. Under the NEW strategy we also focus on human's wellbeing and social cohesion and cooperation. Therefore, equal importance must be given for investments in human and social development.

2.3.1 Ensuring Nutrition, Health Care

Health care is an important pillar of human and social well-being. The purpose of health care up gradation is to ensure universalisation of the health care system and ensure equal access to quality health care systems. Health care institutions in Uttarakhand are persistently facing a huge shortage of medical and paramedical staff. According to rural health statistics- 2021, 75% position of specialist doctors in Community Health Centres (CHCs) are vacant.

Similarly, nearly 70% of the positions of lab technicians and 38% of nursing staff are vacant in the state. Under the National Rural Health Mission, Rogi Kalyan Samitis (RKSs)/Hospital Management Committees (HMCs) were envisaged to be constituted at public health facilities at the level of PHCs, CHCs and District Hospitals. Early studies showed no awareness of HMCs. (Rawat, et al, 2009).[30] No recent assessment study was available.

The shortage of medical and paramedical staff is clearly reflected in the health outcomes of Uttarakhand. The NFHS-V report reveals that NNMR, MMR and U5MR is as high as 32,39 and 45 per 1000, respectively. Moreover, there is high prevalence of anaemia among children and women and very low coverage of ante-natal and postnatal care for pregnant and lactating mothers. The Palayan Aagyog report suggests that 9% people are migrating because of poor health facilities in their villages. This proportion is even higher in remote districts such as Chamoli, Pithoragarh and Pauri. Apart from basic healthcare facilities such as maternal and child health, the state is also facing challenges related to increase in cases of non-communicable diseases and life-style diseases. This needs to be countered through a campaign of public education and decentralised care. Under the NEW strategy we propose upgrading the health system, increasing the number of health care giving professionals and improving health infrastructure.



[30] Rawat, et al (2009) A rapid appraisal of functioning of Rogi Kalyan Samitis in Uttarakhand. *Indian Journal of Public Health* 53(3):p 171-6, Jul–Sep 2009. https://journals.lww.com/ijph/abstract/2009/53030/a_rapid_appraisal_of_functioning_of_rogi_kalyan.11.aspx

Table 6 Enabling Human, Social and Institutional Development

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Strengthening Individual capacity through better nutrition and health care	50% of popln in 2024 in Lakhs	58.95	10,000	5,895.0
Strengthening the Hospital Management Committees (HMCs) in PHCs, CHCs and Govt Hospitals	Numbers	400	5 lakh	20.0

2.3.2 Education and Vocational Training - REPAIR, PREPARE & COMPERE

2.3.2.1 REPAIR for Employability

As per the findings of the ASER - Annual Status of Education Report, only about 53% of the Vth standard children could read IInd standard text in Hindi. Students of grade 8th in Uttarakhand are very poor in basic arithmetic as well. As per the 2024 ASER report only 16.2% students of grade 8th are able to do basic subtraction and 52.5% of total are able to do simple division.[31] This performance in 2022 was several points below, which showed the erosion in learning that happened during COVID.

In light of the above, the education sector needs to focus on a program of "REPAIR", that is Re-Educating Persons Already In the Labour Force for Remunerative employment. This program would target those who have dropped out or finished school (or even college) without having capabilities commensurate with their paper certificates. Often this dropping out is due to economic reasons.

We have assumed that nearly 50% of persons who have studied up to 8th standard or less, will need this remedial education. Classes run by VOs or local citizens groups or individuals, with no or minimal fee, can play a big role in this.

Under the Right to Education Act, every government school is supposed to have a School Management Committee (SMC), in which a majority of the members are parents. In 2017, it was reported that in Uttarakhand, 97% of the 17,752 government schools had an SMC. However, the functioning of these SMCs is nominal, and they hardly play a watchdog role in improving either the physical infrastructure of the school or the number of teacher and quality of teaching, as evidenced by some case studies. (Priyadarshini, Nibedita, 2021).[32]

[31] ASER, 2024, 'Annual Status of Education Report (Rural), 2024, ASER centre, New Delhi https://asercentre.org/wp-content/uploads/2022/12/ASER_2024_Final-Report_13_2_24.pdf

[32] Priyadrashini, Nibedita (2021). School Management Committee: A Case Study In Rural Uttarakhand. International Education & Research Journal [IERJ] Vol 7, No 4. Apr 2021 https://ierj.in/journal/index.php/ierj/article/view/2265/2280

2.3.2.2 Program for Employment Practice through Apprenticeship and Re-skilling (PREPARE)

Given that as per the ASER survey, about one in three youth between 14 to 18 (40.3% of males and 28% of females reported doing work other than household work, but only 5.6% are getting any form of vocational training, there is an urgent need to "PREPARE", a Program for Employability Practice through Apprenticeship and Re-skilling. Under this, crores of young people would learn vocational skills which will prepare them for employment. In view of increasing innovation, digitalisation, automation, artificial intelligence and machine learning, PREPARE will also re-skill existing workers in newer skills.

This will comprise vocational skill training and work experience, for all new entrants in the labour force, a one year-long paid engagement in a public or private enterprise, in agriculture, manufacturing or services. For agriculture, the school curriculum should include agriculture /horticulture practices to equip youth to adapt and respect the family vocation. For non-farm apprenticeships, any enterprise which employs 10 or more persons will have an obligation to hire at least one apprentice for every 10 workers it has. This will require amendments to the Apprenticeship Act, 1961.

The other new entrants would work in medium farms and firms, and large Farms, Livestock and Green enterprises. While rural youth who wish to stay on in rural areas or nearby small towns would be best suited for medium farms and firms, college-educated and technically qualified young entrants in the employment market would be sent as apprentices to Green and Large Enterprises.

As part of PREPARE, there will be a continuing education or reskilling component, for existing workers in new generation skills in this age of increasing innovation, automation, artificial intelligence and machine learning.

One of the characteristics of current economic strategy is that much needed human services are not widely available, which puts the burden of providing such services largely on women within the households, leading to low female LFPR. As the joint family system breaks down, and even the nuclear family is getting disrupted due to a large number of worker population migrating without family, there is a need to accept that care-giving services (for children, the elderly, the disabled, the sick, etc.) will become paid services.

Fortunately, social norms related to this are changing and thus a large number of employment opportunities will be generated in care-giving services (for children, the elderly, the disabled etc.). A large proportion of these jobs will go to women. That will increase both the female work participation rate, as well as incomes of women, which is a necessary though not sufficient condition for social empowerment. Another advantage of women working in these services is the greater likelihood that the caregivers will be more humane and conscientious about their roles.

There are many states, most notably Kerala, and many metros including Mumbai and Delhi, which are facing an aging population. They have a severe shortage of younger people and thus immigration has opened up in several of these countries for jobs in elder care specifically, but also many other activities which require more physically active workers. While most of these workers may go for a few years and then return, some may settle down there. They would still be a source of remittances for family members back home.

2.3.2.3 'Compere' the Talent among the People - Find and Valorize

Finally there is a need to "COMPERE" the hidden or ignored traditional knowledge and skills among various communities and then curate and present those to the world. For example,

- Carpet weaving and woollen craft by Bhotia Tribes in Chamoli and Pithoragarh dts
- Ringal artisan locally known as 'Rudiya' can be further upgraded and new applications of ringal can be explored.
- Vaids who have knowledge of traditional medicine can be further explored to make better use of local bio-resources.
- Folk songs and dances such as Jagar, Chholia and Dankuni can be further upscaled.
- Sweets of Almora called Bal-Mithai and range of forest food as explored by Himalayan Action Research Centre (HARC) in Uttarkashi and Chamoli
- Blending sheep wool and natal fibbers to innovate in local fabric production.
- Extraction of wild honey, river fishes and rock salt.

These "hidden" skills and knowledge are dying due to negligence and absence of a remunerative market. All such skills and knowledge can be further upgraded to meet modern market requirements. Many of these "compere"-d workers can be employed in green nature-care enterprises, in green and responsible tourism and in well-being enhancement services. Due to congestion and deterioration in the environment quality in urban areas, there is a huge urge among urbanites to get out, even if it is for short weekends. There is already an upsurge of religious tourism which generated crores of jobs in pilgrim destinations. There is a need to encourage this to become green and responsible, so that urban dwellers can leave their destination behind them as clean as before they arrived. This will generate additional jobs in transport, hotels & restaurants, local food, textiles and handicraft production and performing artists.[33]

Table 7 Enabling Human, Social and Institutional Development

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Investment Over Five Years, in INR crore
Strengthening Individual capacity through educational REPAIR/PREPARE/COMPERE	25% of popln	29.48	20,000	5,895.0
Strengthening School Mgmt Committees	Number	18000	2.0 lakh	360.0

[33] MV Foundation (2024) https://mvfindia.in/portfolio/residential-bridge-course-camp/

2.3.3 Building local social groups and civil society institutions

By and large, developmental efforts in Uttarakhand have been government led and supply/scheme driven. As a result, these have not been very effective. A different kind of social mobilization is needed when the goal is developmental rather than welfare delivery.

Demand side has to be strengthened by bringing people into different interest or specific-function groups. Among these, Women's Self-Help Groups (SHGs) and specific-function groups such as Forest Protection Committees, Watershed Management Committees and School Management Committees can be formed/strengthened in rural areas. In urban areas, Resident Welfare Associations, Town Market Committees and Hospital Management Committees can be formed/strengthened as the building blocks of citizen participation.

All these, however, require civil society institutions to organise them. While Uttarakhand has had a vibrant tradition of civil society institutions, most of those are now very short of resources. They need to develop revenue models for their work. Taking advantage of the fact that crores of people from all over India visit Hardwar and Rishikesh for pilgrimage, and lakhs visit the Chardhams – Gangotri, Yamunotri, Badrinath and Kedarnath.

Mission LiFE (Lifestyle for Environment)[34] was introduced by the PM at COP26 in Glasgow in Nov 2021 as a mass movement for "mindful and deliberate utilization, instead of mindless and destructive consumption" to protect and preserve the environment.

Mission LiFE Kendras can be established every 20-30 kms along the Chardham route to educate people about the environmental crises facing us and what can be done about it at the individual and collective level. Revenue can be generated from small visitor fees and sale of souvenirs and serving local cuisine as well as cuisine from various parts of the country.

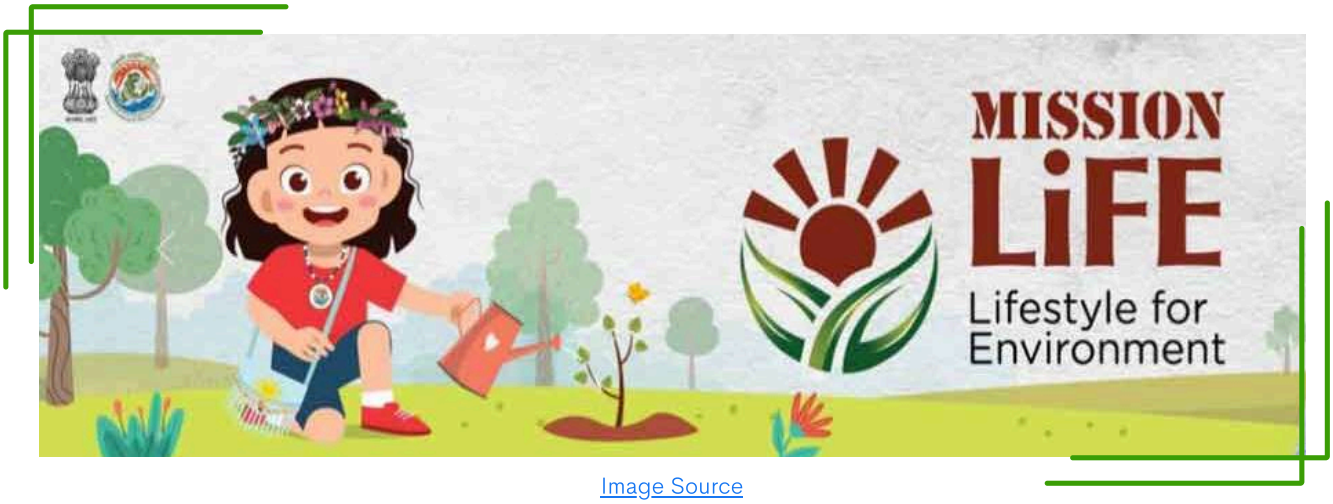


Image Source

[34] Mission LiFE: Lifestyle for Environment (2023). https://www.niti.gov.in/sites/default/files/2022-11/Mission_LiFE_Brochure.pdf

2.3.4 Local Institutional Development

2.3.4.1 Scientific and Technical Institutions - Lok Vigyan Kendras

Uttarakhand had a large number of high quality technical and research institutions. Dehradun is the capital of state and from the British days it has housed some major research institutions such as the Survey of India, the Forest Research Institute, the Wildlife Institute of India, the Wadia Institute of Himalayan Geology, the Indian Institute of Petroleum, the Indian Institute of Remote Sensing, the Indian Institute of Soil and Water Conservation, the Irrigation Research Institute at Roorkee, the Indian Institute of Technology at Roorkee and the GB Pant Institute of Himalayan Environment at Almora.

Most of these institutes are all India in scope and to make good use of their presence, we recommend building local scientific and technical extension and application institutions such called Lok Vigyan Kendras, to use the specialised knowledge of the national institutes to address various challenges facing the state. In this connection, the work done over the past three decades by the People's Science Institute, Dehradun can be a good starting point. The following state level institutes can play a lead role in setting up and mentoring the Lok Vigyan Kendras - the GB Pant University of Agriculture and Technology at Pantnagar and the Veer Chander Singh Garhwali University of Horticulture and Forestry at Amoli Range.

2.3.4.2 Van Panchayats

After a widespread agitation by the people during the British rule, to get access to forests for their fodder and fuelwood needs, the Kumaon Panchayat Forest Rules were enacted under the section 28 (2) of the Indian Forest Act 1927 provides broad guidelines for the supervision and management of forests under the control of Van Panchayats. There are more than 12,000 Van Panchayats in hilly districts of the state, and they govern more than 13% of the total forest cover of Uttarakhand (Jeet Singh, 2023).[35]

However, a series of amendments in 1972, 1976, 2001, 2005 and 2012, diluted the powers of Van Panchayats and passed control of the decision-making process into the hands of forest and revenue department officials. The result is that they have been rendered dysfunctional in almost half of the 12,092 Van Panchayats of Uttarakhand. About 6000 active Van Panchayats manage 405,000 hectares of forests. (Lopes, 2022).[36]

The carbon stock calculation in the India State of the Forest Report, 2024 it was found that natural growth was leading to an increment about 1.04 tons of carbon per hectare, which is equivalent to 3.82 tons of carbon dioxide, which can generate carbon credit revenue @USD 40 per ton, with works out a revenue of about Rs 13,000 per annum per ha.

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[35] Van Panchayats – A Time Tested Institutional Mechanism that can be used for Implementing the Community Forest Rights Component of the Forest Rights Act, 2006. https://www.rgics.org/event/working-paper-van-panchayats-a-time-tested-institutional-mechanism-that-can-be-used-for-implementing-the-community-forest-rights-component-of-the-forest-rights-act-2006/

[36] Lopes, Flavia (2022) How Van Panchayats, Meant To Protect Uttarakhand's Forests, Are Losing Their Relevance. https://www.indiaspend.com/governance/how-van-panchayats-meant-to-protect-uttarakhands-forests-are-losing-their-relevance-830561

Assuming a Van Panchayat has 75 hectares of forest, this amounts to Rs 9.75 lakh per year, of which about 20% may go into cost of forest maintenance, monitoring and verification. Still an income of Rs 8 lakh per annum will dramatically improve the finances of Van Panchayats and the interest of villagers in managing these better. As Van Panchayats can earn significant amounts from carbon sequestration in the tree stock they already have, their capacity to propose and manage carbon finance projects to outfits like the Tropical Forests Forever Facility (Digirolamo, 2024)[37] needs to be built.

2.3.4.3 Panchayati Raj Institutions and Urban Local Bodies

The lack of effective local governance and institutional frameworks in Uttarakhand further hampers social development. Panchayati Raj Institutions (PRIs), which are crucial for local governance, are often underfunded and lack the capacity to deliver developmental programs effectively. Our review of Panchayats in Uttarakhand indicates that they are largely dependent on Central and State Finance Commission Grants. The reason why their own revenue is less than 6% of their total income has to do with the fact that they have very limited powers to raise resources locally, nor does a lot of the rural population have adequate income to pay more local taxes.

A World Bank Report (2023) reveals that 42% of Panchayats do not have sufficient resources for local development projects. This limits the scope of community-driven initiatives, especially in the hill districts, where infrastructure and resources are already stretched thin. PRIs. So, our recommendation is that the State Government should devolve funds, functions and functionaries in the true spirit of the 73rd and the 74th amendments to the Constitution and take all steps necessary to build the capacity of PRIs and ULBs.

Given below are the recommended investments for each type of local institution, to strengthen their staffing, systems and member participation. For Van Panchyats, we have recommended a capacity building grant. In case of abandoned villages, it also includes some incentive payments to returning families or ne settlers who decide to repopulate those villages.

[37] Digirolamo, Mike, (2024). Mongabay , https://news.mongabay.com/podcast/whats-the-tfff-a-forest-finance-tool-like-no-other-shows-promise-pitfalls/

Table 8 Investment in Local Institutional Capacity Building

Local Institutions	Number in Uttarakhand	Investment Rs lakh per institution	Total investment Rs Crore
Gram Panchayats	7791	5	389.55
Kshetra Panchayats	95	25	22.50
Zilla Parishads	13	100	13.00
Sub-total PRIs			**425.05**
Nagar Panchayats	43	25	10.75
Nagar Palika Parishads	43	100	43.00
Nagar Nigams	12	1000	120.00
Sub-total ULBs			**174.00**
Van Panchayats	6000	10	600.00
Abandoned Villages	2000	100	2,000.00
Total			**3,199.00**

Image Source

Table 9 Enabling Social - Human and Institutional - Development

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Investment Over Five Years (INR crore)
Strengthening Individual capacity through better nutrition and health care	50% of popln in 2024 in Lakhs	58.95	10,000	5,895.00
Strengthening the Hospital Management Committees HMCs in PHCs, CHCs and Govt Hospitals	Number of HMCs	400	500000	20.00
Strengthening Individual capacity through educational REPAIR/PREPARE/COMPERE	25% of popln	29.475	20,000	5,895.00
Strengthening School Management Committees	No of SMCs	18000	200000	360.00
Strengthening Individual Development through nutrition, health, education. skills				12,170.00
Strengthening capacity of local groups SHGs, RWAs to build social cohesion and participation	Number of local groups – one per 200 popln	58,950	200,000	1179.00
Strengthening capacity of civil society institutions and helping them establish Mission LiFE Kendras along the Chardham Route and in Haridwar and Rishikesh	Number of Kendras	100	20,000,000	200.00
Strengthening capacity of Van Panchayats to undertake greater management roles and to prepare for carbon sequestration financing	Number of VPs	6000	1,000,000	600.00
Strengthening capacity of local self-government (panchayats, municipal bodies) to build citizen participation and institutional accountability	See Table above			600.05
Building local scientific and technical research institutions - Lok Vigyan Kendras	One per block / city	100	20,000,000	200.00
Building Udyam Sahay Kendras to provide support services to enterprises	-do-	100	20,000,000	200.00
Revival of abandoned villages into heritage eco villages – initial social mobilization for settlers	Number	2000	10,000,000	2000.00
Institutional Development		NA	NA	4,979.05
Enabling Social Development		NA	NA	17,149.05

2.4 Well-th Creation

Well-th creation is broadly possible through enterprise in agriculture, industry, including construction and services. We are proposing forward movement in all three, taking into account the profile of employment needed, the location where it is needed and the demands of environmental sustainability.

2.4.1 Upgrading farms to "DECI" agricultural enterprises

Traditionally, farms on the mountain slopes and in the valleys of Uttarakhand have been seen as a means of subsistence for the immediate family. To the extent there was a surplus of some commodities such as mandua or rajma, these were taken to places like Haldwani, the gateway town to Kumaon and Dehradun/Rishikesh the gateway towns to Garhwal, for trading and in turn purchase of salt, spices, cooking oil, cloth, utensils and other household use items not produced locally in the mountains.

This form of subsistence agriculture has proven to be not viable anymore, leading to widespread abandonment of whole villages or leaving lands fallow. The way out of this downward spiral is to reimagine Uttarakhand agriculture in agro-ecological terms, where food crops, specialised other crops, horticulture, farm forestry and animal husbandry, all go hand in hand, using the principles of natural farming and avartansheel kheti (circular agriculture) where crop residue, leaf fall, animal dung and household waste is composted to produce farmyard manure.

We recommend that Uttarakhand agriculture should move from subsistence farming to agricultural enterprises with DECI characteristics. Recall that DECI stands for Demand, Entrepreneurship, Capital and Inputs/Infrastructure. We deal with each of these one by one below:

2.4.1.1 Demand

As per the Household Consumption Expenditure Survey, 2022-23, Uttarakhand had a per capita monthly consumption expenditure of Rs 4640 in rural areas and Rs 7004 in urban areas. Of the total consumption of Rs 4640 per capita per month in rural Uttarakhand, the following were the main items: cereals, pulses, sugar, salt, milk and milk products, vegetables, fruits, eggs, fish and meat, edible oil, spices, beverages and processed foods, pan, tobacco and intoxicants, making a total of Rs 2000 per capita pm for food items. Thus an average district with even 10 lakh population will generate demand for Rs 200 crore of food items. Thus, there is enough local demand - it just must be met through local production. This would also be a way of ushering in a locally self-sufficient economy, or a "100 mile" economy, as envisaged by Gandhian late Smt Ela Bhatt in her book Anubandh[38] (Bhatt, Ela. 2018).

This is not to say that Uttarakhand agriculture should not meet external demand. Indeed, given their higher altitude, cooler temperature and earlier rains, they can take advantage of their proximity to the Delhi NCR and Uttar Pradesh state, to supply "off-season" vegetables. In addition, the state can be source of fruit, flowers, spices, medicinal and aromatic plants.

[38] Bhatt, Ela, 2018. Anubandh – Building 100 Mile Communities. Navajivan Trust, Ahmedabad

2.4.1.2 Entrepreneurship and Skill Development

Not all small farmers are entrepreneurial. Those who are, need to be selected carefully and mentored. Of course, to produce some of these items, which these enterprising farmers may not have done earlier, they will need some skill training. That is why we recommend many more Krishi Vigyan Kendras to be opened and agricultural extension workers to be hired and deployed by the government.

Technology options would be adopted to reduce dependence on labour in agriculture /horticulture considering labour shortage in agriculture.

2.4.1.3 Capital and Credit

While working capital is available to farmers through the Kisan Credit Cards, the problem is in raising investment capital for farm upgradation.

The upgradation of small farmers into DECI farmers and medium and large farmers into MESO farmers will require investment. This will be for land development, water resource development, irrigation facilities, greenhouses, agricultural equipment, storage, etc. We have made a number of assumptions to compute the total investment required to transform agriculture in Uttarakhand.

2.4.1.4 Inputs and infrastructure

The other main constraint in transforming agriculture in Uttarakhand is inputs and infrastructure. Inputs can be improved seed varieties, which are climate resilient, or new apple variety rootstock, or mushroom spawn. Infrastructure is things like bulk milk coolers, warehouses, packhouses, transport to end markets, etc.

As we discussed earlier in this report, the land holdings are very small in Uttarakhand. As high as 73% farmers are marginal farmers having less than one-hectare agricultural land. More than 17% farmers are small farmers having land between 1 and 2 hectares.

Another 7% farmers are semi-medium farmers having land 2 to 4 hectare. A miniscule (around 2%) farmers have medium and large holdings in Uttarakhand.[39] Not all small farmers can transform into DECI farmers, nor can all medium and large farmers become MESO farm enterprises.

We are therefore recommending the following interventions:

- Sub-marginal (below 1 acre) holdings can grow flowers, spices, medicinal plants, mushroom and bee-keeping. These crops do not require much land and are care-intensive which only a farmer family can offer. Of course, they would have to be provide market linkages, which can be organised through FPOs and SHG Federations.

[39] https://revenue.uk.gov.in/files/Agriculture.Census.in.Uttarakhand.pdf

- Marginal and small farms can grow for local markets. The GOI has identified 3900 clusters in Uttarakhand[40] under the Paramparagat Krishi Vikas Yojana to bring under traditional agriculture, also referred to "Sari" system (Satish Chandra, et al)[41] and grow "barahnaja" (12 types of grains)[42] – namely Mandua/Ragi (finger millet); Ramdana (amaranth); Rajma (kidney bean); Ogal (buckwheat); Urad (black gram); Moong (green gram); Gahat/Kulath (horsegram); Bhat (soyabean); Lobiya (Cowpea); Kheera/kakdi (cucumber) ; Bhangjeera (hemp); and Jakhiya (cleome). . Of course wheat and rice (Paddy) will also be grown.

- Such farmers in the abandoned villages revived as heritage eco villages, can benefit by growing these local traditional crops and then serving them to the vistors as part of the local heritage cuisine.

- Medium sized farmers also become DECI Farms - growing cash crops, with controlled irrigation, polyhouses, aggregation and urban market access. They must build on the reputation of Uttarakhand as a source of authentic organic produce and tap as much of the demand for organic vegetables and fruits in the Delhi NCR markets as possible.

- Organic farming or natural farming is part of local practices and still practiced in mountain districts of Uttarakhand. Uttarakhand has been a pioneer in this field with the Uttarakhand Organic Commodities Board having been constituted in 2003. It has registered 4.8 lakh farmers with 2.26 lakh hectares of land. They have been organised in 4527 producer clusters and 381 organic producer groups. (UOCB website, 2025)[43]. They may be encouraged to adopt the PGS, or Participatory Guarantee System, a quality assurance initiative for organic farming that focuses on local participation and trust among producers, consumers, and other stakeholders. More small farmers can be brought under the certified organic production system to enhance their productivity and link them to a high value market.

- Some small and medium farmers become livestock enterprises - enhancing productivity through breed improvement, stall feeding, biogas digesters, etc. The Uttarakhand Livestock Development Board has been constituted as an autonomous body in 2001, for strengthening of the institutional set up dealing with breeding and development of cattle and buffaloes, improving their production and productivity. There is also a separate scheme for goat farming by women, which is suitable for forested hill slopes. Schemes for fish farming, including trout, also exist.

- Large farmers become MESO Farms -aimed at metro and export markets, with polyhouses, packhouses. Already, the farmers of the Terai district of Udham Singh Nagar have established a name for high yielding agriculture under the expert guidance of the GB Pant Agricultural University. They are bulk producers of wheat.

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[40] Uttarakhand Organic Commodities Board, https://uocb.org/resources/

[41] Satish Chandra, et al (2020) Sari System: A Traditional Cropping Pattern of the Uttarakhand Himalaya https://www.researchgate.net/publication/339906300

[42] Gururani, Kavita et al. (March 1, 2021). "Mainstreaming Barahnaja cultivation for food and nutritional security in the Himalayan region". *Biodiversity and Conservation*. **30** (3): 551–574. doi:10.1007/s10531-021-02123-9

[43] Uttarakhand Organic Commodities Board, https://uocb.org/

Given below are some interventions that can be used to meet the local demand, in the process increase incomes of farmers and generate employment.

Table 10 Interventions and Investments Needed to Upgrade the Farm Sector in Uttarakhand

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR at 2024 prices	Total Investment Over Five Years (INR crore in 2024 prices)
Sub-marginal (below 1 acre) holdings to be converted to flowers, spices, medicinal plants, mushroom and bee-keeping	Number	5,38,587	50,000	2,693
Marginal and small farms to become DECI Farms - enhancing productivity through soil and water conservation, irrigation, greenhouses, growing cereals and vegetables for local markets	Number of marginal and small farms	8,07,881	1,00,000	8,079
Organic and traditional farming promotion in clusters, particularly in abandoned villages revived as heritage eco-resorts.	Number of clusters	5900	100,00,000	5,900
Medium sized farmers to transform into DECI Farms - growing cash crops, with controlled irrigation, polyhouses, aggregation and urban market access	Number of medium farms	14,496	10,00,000	1,450
Large farmers become MESO Farms with poly- houses, packhouses, aim at metro/export mkt,	Number of large farms	888	50,00,000	444
Some small and medium farmers become Livestock enterprises - enhancing productivity through breed improvement, stall feeding, biogas digesters, etc.	5% of number of all farms	41,163	5,00,000	2,058
Agricultural Enterprises	NA	NA	NA	**20,624**

A total investment of Rs. 20,624 crore is required for next five years to transform agriculture of Uttarakhand into a more profitable and sustainable. Annually investment of around Rs 4,000 crore is required in the state.

2.4.2 Promoting non-farm manufacturing and service enterprises

As per the Annual Survey of Unincorporated Sector Enterprises (ASUSE), 2023 there were 5,82,012 enterprises in Uttarakhand in 2022-23.[44]Out of these, as much as 4.72 lakh or 81% of the enterprises in Uttarakhand are Own Account Enterprises (OAE). These enterprises do not employ any staff. The owner or his/her family works in these enterprises. These enterprises account for more and 81% of the total enterprises in Uttarakhand. The ASUSE survey of NSSO in 2022-23 reveals that Hired Worker Enterprises (HWE) are about 1.09 lakh in the state where one or more staff are hired. In total trade and service enterprises both categories are high which includes shops, tourist centres and IT centres. Manufacturing enterprises in the state are few.

Their breakup by size and activity is below:

Table 11 Type of Enterprises in Uttarakhand

Type of Enterprise	Rural	Urban	Total
Own Account Enterprises (OAE) in Manufacturing	43683	16733	60416
Own Account Enterprises (OAE) in Trade & Services	281861	130670	412531
Hired Worker Enterprises (HWE) in Manufacturing	7718	8829	16547
Hired Worker Enterprises (HWE) in Trade & Services	47820	44698	92518
Total	**381082**	**200930**	**582012**

As can be seen from the above, enterprises with hired workers, in manufacturing, are the least in number. In general, OAEs are much more numerous compared to HWE. We suggest that the problems of unemployment can be addressed by transforming some of these micro-enterprises into what we call DECI and a smaller number into MESO enterprises.

The term DECI has been coined for micro enterprises which have potential to meet the market demand and create jobs. DECI stands for local Demand, Entrepreneurship, Capital/Credit and Inputs/Infrastructure.

The term MESO stands for larger enterprises that can cater mainly to Metro and Export demand, are run by Socially, ethically and environmentally responsible entrepreneurs with a Skilled workforce; and that have an Organised supportive ecosystem. We recommend transforming some OAEs to DECI enterprises – targeting local markets, better equipment, renewable energy, and diversification.

We also recommend transforming manufacturing HWEs into MESO manufacturing enterprises – targeting local markets with better equipment, renewable energy and material recycling.

[44] Annual Survey of Unincorporated Sector Enterprises (ASUSE), 202353, pdf p 489-521

Given below is a table with various potential activities identified in each district by the State Level Bankers' Committee (SLBC) as part of the state level credit plan 2021-22. (SLBC, 2022)[45]

DISTRICTWISE POTENTIAL ACTIVITIES IDENTIFIED

DISTRICT	POTENTIAL ACTIVITIES
Almora	Fruit Processing, Medical and Herbal Plants, Tourism & Transport
Bageshwar	Weaving & Knitting, Automobile repair, tourism and Transport
Champawat	Fruit Processing, Medicinal & Herbal Plants, Tea processing, Woolen Garments, Tourism and Transport
Chamoli	Horticulture, Handloom, Fruit Processing, Tourism and Transport
Dehradun	Wooden Furniture, Electrical Goods, Fruits & Vegetables processing, Tourism and Transport
Haridwar	Artificial Jewellery, Agro Processing, Cane and Bamboo, Textile, Tourism and Transport
Nainital	Gems Stone Cutting and Polishing, forest based industry, stone crushing, agro/fruit processing, Textile, Tourism & Transport
Pauri	Weaving, Stone Works handicrafts, fruit processing and Transport
Pithoragarh	Medicinal plants and Herbiculture, tea processing, woolen garments, copper works and Transport
Rudraprayag	Wooden Crafts, Fabrication of improved agriculture implements, basket making, Tourism and Transport
Tehri	Sericulture, Stone works, wooden crafts, electrical goods, handloom and Transport, Water Adventure Sports
U.S. Nagar	Industries like Heavy Automobiles , Electronic goods, handloom, stone works, agro/fruit processing and Transport
Uttarakashi	Agro/Fruit Processing, Medicinal and herbal plants, Stone/Leather works, Tourism and Transport

2.4.2.1 Udyam Sahay Kendras

To establish and host an organised eco-system for supporting enterprises, it is necessary to have several of them in a single location, known as a cluster. Experience in other states has shown that cluster associations can best establish and manage various support services such as infrastructure (roads, water supply, drainage/effluent treatment, worksheds, telecom facilities, etc.) or enterprise services (accounting, compliance, access to finance, market research, product and process design, packaging, market linkages, etc.) or skilled workforce training.

[45] SLBC, 20 21 Annual Credit Plan for Uttarakhand, 2021-22 http://www.slbcuttarakhand.com/documents/ACP%20BOOK%202021-22.pdf

We recommend the establishment of such Udyam Sahay Kendras (Enterprise Support Centres) in a large number of clusters, to build on the one district, one product program and take it down to block and town level. We are thus proposing 100 Udyam Sahay Kendras, one each in 95 blocks and 5 major towns. The clusters will broadly focus on the list of products shown district-wise in the table above.

2.4.2.2 Reviving Abandoned Villages into Eco and Heritage Tourism Hubs

We also recommend transforming some Service HWEs into MESO Service enterprises -targeting outsiders visiting Uttarakhand, particularly revived abandoned villages as new eco-tourism and heritage hubs, with better facilities. It has been estimated that there are about 2000 villages in Uttarakhand which are abandoned completely or significantly. These are often at remote locations but are in exceptionally attractive locations in terms of scenic beauty and the natural environment. Many of them still have standing homes, though in partial disrepair. We have already recommended revival of traditional agriculture in these villages. In addition, these villages can host a number of home stays, and serve local cuisine, as well as perform local songs and dances, and make local handicraft items. The State Government's Veer Chandra Singh Garhwali Yojana funding can be used for this.

Table 12 Interventions and Investments Needed to Upgrade Non-Farm Enterprises

Interventions Proposed	Units	Number of units to be covered	Cost per Unit in INR lakh at 2024 prices	Total Investment Over Five Years in INR crore
Some OAEs transforming to DECI enterprises - targeting local markets, better equipment, renewable energy, and diversification.	60% of all OAEs	3,09,235	5.0	15,462
Manufacturing HWEs transforming into MESO manufacturing enterprises - with better eqpt, renewable energy and material recycling	70% of Mfg HWEs	13,166	250.0	32,914
Service HWEs transforming into MESO Service enterprises - particularly revived abandoned villages as new eco-tourism and heritage hubs.	80% of service HWEs	36,339	100.0	36,339
Total investment in Non-farm Manufacturing and Service Enterprises	**NA**	**NA**	**NA**	**84,715**

Not all OAEs can transform into DECI enterprises nor can all HWEs transform into MESO enterprises. That is why we have assumed different percentages – 60% of OAEs, 70% of manufacturing HWEs and 80% of service HWEs - to be transformable.

However, by following appropriate promotional policies and ensuring the availability of credit from banks, it will be possible for a proportion of these enterprises to transform and generate employment for a more skilled workforce at a higher wage rate.

Moreover, by switching to renewable energy, practicing material recycling and energy efficiency, these firms can also generate environmental benefits.

A large number of these transformed enterprises will be in services. These will be significantly digitalised in their core functions – ordering and paying for raw materials, marketing their goods/services. receiving orders and payments, and accounting and compliance.

Even their financing – whether term loans, or cash credit, will be handled digitally. The widespread access to the internet, to be improved further where needed, is a critical public infrastructure that must be ensured by the government.

Image Source

3 Level of investment required, its benefits and sources

3.1 Investment required

The NEW strategy for Uttarakhand as alternative to Business As Usual (BAU) is explained in the chapter-1 and economically justified in the chapter-2 of this report. We estimate that Uttarakhand requires an investment of Rs. 146,344 crore for various interventions to meet NEW Strategy goals over a period of 5 years.

Of the proposed investment, 16.3% will go into Nature regeneration, 11.7% into Enabling social development and 72.0% in Well-th creation through agricultural and non-farm enterprises. We maintain that unless the first two sets of investment are made - in nature and people, investing in enterprises will not succeed, and to the extent it does, it will serve only the top few percent of the population.

Investment for the regeneration of nature (Rs 23,856 crore) and social development (17,149 crore), together accounts for about a quarter of the total investment required for the NEW Strategy. However, we assert that investing Rs 105,339 crore or about three-fourths of the total investment on Well-th creation without investing in social and ecological wellbeing will not bear any fruit because of the interconnectedness of the three crises.

Table 13 Summary of Interventions Required in Rs Crore

Interventions Proposed	Total Investment Over Five Years (INR crore in 2024 prices)
Regeneration of Water Commons	6,148
Regeneration of Forest Commons	16,141
Regeneration of Land - Common and Private	1,567
Nature Regeneration	**23,856**
Strengthening Individuals' Health and Education	12,170
Strengthening Institutional Capacity	4,979
Enabling Social Development	**17,149**
Agricultural Enterprises	20,624
Non-farm Manufacturing and Service Enterprises	84,715
Well-th creation through Enterprises	**105,339**
Total	**146,344**

3.2 Benefits of the investment

The proposed investment in all three sectors will bring a lot of social, ecological, cultural and economic benefits. The improvement in the natural resources will help to promote livelihoods, enrich biodiversity, sequester greenhouse gases, provide water to perennial rivers and create climatic resilience. More such benefits can be identified. However, here in this section we only estimated economic benefits in terms of GSDP growth and employment. The following table provides basic estimation of economic and livelihood benefits of the proposed investment.

Table 14 Investments Required and Benefits in Additional Output, Employment and Wages

Interventions Proposed	Total Investment Over Five Years (INR crore in 2024 prices)	Additional GDP per annum after 5 yrs due to this investment (in INR crore at 2024 prices)	Employment in person years on an ongoing basis after 5 yrs	Addl Wage Income for the state after Investment Period Rs cr pa	Average wage or earning per worker in Rs lakh pa in 2024 prices
Regeneration of Water Commons	6,148	1,537	38,425	922	2.4
Regeneration of Forest Commons	16,141	4,035	100,881	2,421	2.4
Regeneration of Land - Common and Private	1,567	392	9,794	235	2.4
Nature Regeneration	**23,856**	**5,964**	**149,100**	**3,578**	**2.4**
Strengthening Individuals' Health and Education	12,170	3,043	38,031	1,826	4.8
Strengthening Institutional Capacity	4,979	1,245	15,560	747	4.8
Enabling Social Development	**17,149**	**4,287**	**53,591**	**2,572**	**4.8**
Agricultural Enterprises	20,624	6,875	171,867	4,125	2.4
Non-farm Manufacturing and Service Enterprises	84,715	16,943	141,192	6,777	4.8
Well-th creation through Enterprises	**105,339**	**18,290**	**313,058**	**10,902**	**3.8**
Total	**146,344**	**28,541**	**515,749**	**17,053**	**3.45**

Source: Computations by the author

The NEW strategy will ensure that benefits of the investment accrue in terms of:

- Economic Growth (GSDP will grow in five years by Rs 28,541 crore per annum, which is about 7% of the 2024 GSDP over and above the normal growth) and will be wider and more inclusive.

- Employment – almost 5.16 lakh new jobs, all of them at a remuneration level which at the minimum will be the prevailing per capita income in 2024 – approximately Rs 20,000 per month, and for many of the jobs, much higher remuneration.

- Social Development - Health and Education improvements which will greatly enhance citizens' quality of life and increase in healthy active life years. In addition, the social energies released and institutional effectiveness increase would lead to collective action on many fronts that impact citizens' lives and also the environment.

- Environmental benefits in terms of more availability of clean water, less impact of monsoon failure or other adverse events, increase in green cover, production of more nutritious food crops with less chemical intensity, and reduction in carbon dioxide and GHG emissions as also carbon dioxide sequestration, which if aggregated and sold in the global carbon markets will fetch Rs about Rs 6800 crore per annum from the sixth year.

3.3 Where to mobilise investments from

As stated earlier, a total of Rs 146,452 crore of investment is needed in the proposed interventions over a period of five years. This is a substantial amount, being 37% of Uttarakhand's GSDP in 2024-25. Though we are suggesting these investments to be made over a five-year period, the annual investment target is still 8% of the 2024 GSDP and about 42% of the government expenditure budget for 2024-25, which was about Rs 70,000 crore. Obviously, we are not expecting all of this to come from the government.

Table 15 Investments Required and Where to Mobilise Investments From

Interventions Proposed	Total Investment Over Five Years (INR crore in 2024 prices)	Own private funding by individual, or community	Bank/FI loans taken by private individuals/ entities	Philanthropic foundations and CSR funds	Individual giving, resource sharing and volunteering	Climate finance against AMSERS with sovereign guarantee	Balance from the Govt Budget over five years
Nature Regeneration	23,856	1,193	3,578	1,193	2,386	11,928	3,578
Enabling Social Development	17,257	2,589	863	7,766	863	1,726	3,451
Well-th creation through Enterprises	105,339	26,335	52,670	5,267	5,267	21,068	-5,267
Total	146,452	30,116	57,111	14,225	8,515	34,722	1,763
As % of Total	**100.0%**	**20.6%**	**39.0%**	**9.7%**	**5.8%**	**23.7%**	**1.2%**

We identified five different sources of funds for the proposed investment. These include community contributions, bank loans taken by individual farmers and entrepreneurs, climate finance (facilities like the TFFF) and philanthropic/CSR funding. We have shown that the bank loans proposed by us of Rs 57,111 crore over the next five years is about the same as the annual credit target for 2025-26. This typically rises by 15-20% every year so our ask is a going to be a fraction of total bank credit in the state. As a result, the government is expected to contribute only about 23.7% of the investment on an annual basis, which comes to about 10% of the government budget in 2024. A vast majority of this will go for Nature regeneration and Enabling social development. Most of the investment in upgradation of farm and non-farm enterprises will be done using bank financing leveraged by own funds.

4 A Call to Action

The message from our detailed analysis of the Environment, Social Development and the Economy of Uttarakhand, given in Appendix 1, 2 and 3, is clear: both the natural environment and the socio-economic situation in Uttarakhand are at a serious level of deterioration and require urgent action for regeneration/revival. There are five levels at which action will have to be taken:

1. Individuals by themselves; as citizens, as activists, as thinkers and influencers
2. Individuals by joining local community Social Groups; and by individuals joining organised NGOs/Civil Society Institutions
3. Gram Panchayats/Zilla Parishads/Town Wards / Municipalities
4. State and Central Government departments and specialised agencies
5. International Cooperation at the Regional and Global level

We give below some suggestions for action at each of these levels, broadly covering environmental, social, and economic aspects.

4.1 Individual actions

4.1.1 Environmental aspect

Every individual will have to become mindful of their ecological footprint, in terms of Greenhouse Gas (GHG) emissions contributing to global warming and in other ways in which we damage the environment – whether by excessive use of fossil fuel energy, for heating or transportation, or by polluting the environment with untreated effluents and solid waste. While it may appear that the contribution of any one individual is miniscule and cannot make a difference to large trends like global warming, we must recognise that the effect of our individual actions gets multiplied by the population of the village/district/state or country. So, for example, at the level of Uttarakhand, each ton of carbon emissions saved by an individual over a year will add up to 1.2 crore tons of carbon dioxide emission reduction.

There are two ways in which individuals can impact the environment – first by cutting their own emissions and second by persuading others to do so. For example if the individual is a rice farmer, she should adopt techniques such as system of rice intensification (SRI) which, involves cultivating rice with as much organic manure as possible, starting with young seedlings planted singly at wider spacing in a square pattern; and with intermittent irrigation that keeps the soil moist but not inundated, and frequent inter cultivation with a weeder that actively aerates the soil. The SRI system was widely promoted in Uttarakhand by the People's Science Institute, Dehradun in the previous decade.

Another environmental action that the farmers of Uttarakhand can take is to ensure that no land is left fallow or unused in their small farms. As per land use data, as much as 23% of cultivable land is at present not cultivated.

We have already recommended the revival of traditional agricultural in such lands using the Paramparagat Krishi Vikas Yojana. Those who want to grow specialist crops like flowers and off-season vegetables can set up water harvesting structures and polyhouses.

Another major individual action can be by adopting a largely vegetarian diet since meat based food requires a lot more energy to produce, and its production emits a lot more methane from animal excreta. To the extent animal dung is produced, it should be used in bio-digesters where the methane can be used as fuel. Methane is 84 times more harmful than carbon dioxide in a 20 year period. Methane is the second most important greenhouse gas contributor to climate change, after carbon dioxide and accounts for about 16% of emissions. For those who keep cattle for dairy purposes, setting up a biogas plant would both benefit the environment, as also lead to savings on purchase of kerosene, LPG or fuelwood.

Individuals living near forests should join forest protection committees and use the Forest Fire Alert App of the Uttarakhand Forest Department, which receives forest fire alerts from the Forest Survey of India (FSI), using MODIS sensors. These alerts are crucial for proactive fire management, including the deployment of rapid response teams, and public awareness efforts facilitated by the use of social media.

Forest fire watcher teams ensure that forest fires do not get started due to rash actions, which would be an important contribution. Not only do these fires damage the forest where the fire burns, but the ashes get deposited over the glaciers and cause those to melt much faster due to greater heat absorption.

4.1.2 Social aspect

Individual actions at the social level include ensuring that one interacts adequately with one's neighbours and local community. Merely interacting with one's own kind is not enough as it builds strong bonds with "people like us" but alienates others. Thus, social interaction should cut across gender, age, caste, religion, language and class.

Only this can establish the basis for harmony among those with diverse backgrounds. It is only when we understand and maybe even try out some of the ways of others – in terms of food, dress, festivals, ways of looking at the world and so on, that we can appreciate diversity and its benefits.

Taking advantage of the fact that Uttarakhand attracts crores of pilgrims to Hardwar and Rishikesh and lakhs to the Chardhams, we have already recommended that civil society institutions run Mission LiFE centres for building environmental awareness. These same centres can also be used to build harmony and the message of unity in diversity.

At a more assertive level, individual social action can be to firmly oppose any attempts at exclusion, injustice or disharmony, merely on grounds of gender, age, caste, religion, language and class. If for example, one finds some people excluded on the grounds of caste or others on the basis of religion, this should be raised and discussed. These discussions can then be used to bring about a greater awareness among fellow beings in the community about the importance of the values embodied in the preamble of our Constitution – justice, liberty, equality and fraternity, along with sovereignty, secularism and socialism.

In the context of Uttarakhand, individuals and civil society institutions need to assert the right of Muslims, Dalits and Adivasis to live in the state like any other citizen and condemn any attempts to communalise politics. The regional divide of Garhwal and Kumaon; Pahad and Plain; Rural and Urban must be addressed through inter-regional interactions and frequent visits. These can later lead to mutually profitable business relationships as well.

4.1.3 Economic aspect

Individual actions at the economic level include ensuring first of all one's own steady income through a job or self-employment of any kind. If one wants a certain type of job, getting qualified for it in terms of education and skill acquisition should be one's prime concern. If no suitable jobs are available, then one should try self-employment in an activity in which there is local demand for the product or service. For this one may have to also acquire both business and technical skills and move out of one's zone of comfort. Yet, as we know, lakhs of people establish micro-enterprises.

Many young people are unwilling to stay back and work in rural areas as they think they will have to do traditional farming which is not very remunerative. As it happens there are now a large number of opportunities in diversified agriculture which includes organic farming, production of bio-inputs, mushroom cultivation, horticulture, floriculture and ornamental plants, medicinal and aromatic plants, dairy, poultry, fishery and bee-keeping.

Image Source

In addition, lots of jobs will arise in nature care enterprises, for the regeneration of jal jangal, jameen and jalvayu as well as in renewable energy as well as recycling of materials. For women who want to work part of the time because of home care duties, there are jobs opening for paid nurture/care of children, the elderly, the sick and the disabled, in urban areas as also digital opportunities like running home stays in rural areas.

At the next level, individual economic action can be to resist exploitation and corruption, or engage in it oneself. Eschewing over-consumption and living beyond one's means through the "buy now pay later" philosophy. Instead saving for desired acquisitions and important life-cycle events should be adopted.

4.2 Social groups, NGOs and Civil Society Institutions' actions

4.2.1 Environmental aspect

Individuals can be more effective by joining environmental action groups / NGOs to undertake clean ups of solid waste, tree plantation and spreading awareness. These groups can also be used to influence organised public systems such as panchayats and municipalities to do more for conserving the environment such as banning leaf fall burning, composing food and organic waste, recycling plastic and other solid waste, treating sewage with minimum methane emissions, prohibiting dumping of solid waste and sewage in rivers, establishing green belts, renovating water bodies for water harvesting and recharging groundwater. Polluting industries should be taken to task and citizens should report them.

4.2.2 Social aspect

Individuals joining local social groups or NGOs and volunteering – whether for conducting classes in simple literacy[46] (as per CAMS report, 2.4% of persons between 6 to 18 years of age in India have never attended school). That comes to roughly 72 lakh persons., or for those literate, classes could be conducted in financial or digital literacy, career counselling for youngsters, helping with a community library or cultural centre, or arranging support services for the elderly and the disabled, ad those temporarily unwell, or organising community celebration of the important festivals of all communities – Holi, Diwali, Id, X-Mas, Gur Purab, Buddha Purnima or Mahavir Jayanti or Navroz, or locally important festivals like Bihu in Assam or Pongal in Tamil Nadu. All these activities build mutual familiarity, trust and collaboration – all of which are the building blocks of social capital.

Any functioning society needs widespread mutuality, trust and collaboration, all of which come in useful whenever there is an adverse event – whether for an individual, a family, a neighbourhood, a city or a region, as has happened at the time natural disasters with increasing frequency. COVID taught us that eventually it was the courage and forbearance of affected individuals, the kindness of other individuals, and the big-heartedness of organised communities and civil society which saved us from the inaction and ineptitude of the "authorities" at various levels of government.

4.2.3 Economic Aspect

Joining a group –whether an informal self-help group or an organised NGO or a cooperative or a farmers' producer organisation or a consumer union can greatly strengthen individual economic action to resist exploitation and corruption, or eschewing over-consumption and living beyond one's means. With a steep rise in borrowings, net household savings have significantly declined post-pandemic, dropping from an average of 21.1% of GDP in the pre-pandemic decade to 18.4% of GDP in FY23 (CARE).[47] Instead, saving for desired acquisitions and important life-cycle events should be promoted.

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[46] NSSO, 2024, Report on Comprehensive Annual Modular Survey (CAMS) 2022-23
https://www.mospi.gov.in/sites/default/files/publication_reports/CAMS%20Report_October_N.pdf

[47] CARE (2024). State of Household Finances: A Post Pandemic Study
https://www.careratings.com/uploads/newsfiles/1726222456_Household%20Finances_CareEdge%20Report.pdf

Coming together even in informal groups is a great incentive for saving regularly. Women from lower-income households organised in SHGs saved over Rs 58,893 crore in banks as on 31 Mar 2023[48] (CARE, 2024). Savings in cooperative banks is the next step, in 2024, there were over 1,500 scheduled and non-scheduled Urban Cooperative Banks in India with a total number of branches exceeding 11,000. The banks had a deposit base of over Rs 5.33 lakh crore, and total lending of more than Rs 3.33 lakh crore.[49]

Also taking insurance cover against unforeseen adverse events– be it health incidents (as per the CAMS Report 2022-23, the average per household medical expenditure per annum was Rs 7499 in urban India and Rs 5041 in rural India, which is a significant part of the annual per household incomes)[50] or accidents or fire and theft – should be encouraged. Risk pooling is the basic theory in insurance, which began as an informal mutual help effort. We must promote more mutual insurance programs than the present corporate ones.

Here there is a great role for those individuals who are influencers, whether in the traditional face to face interactions or on the new social media. They must expose the hollowness of the "high living, no thinking" lifestyles that are being promoted by the current economic model which needs people primarily as consumers, as long as they can pay for it.

Image Source

[48] https://www.nabard.org/auth/writereaddata/File/highlights-of-the-shg-bank-linkage-programme-2022-23.pdf

[49] https://pib.gov.in/PressReleasePage.aspx?PRID=2010318

[50] ibid.

4.3 Gram Panchayats/Zilla Parishads/Municipalities

4.3.1 Environmental aspect

Public representative bodies such as Gram Panchayats and Zilla Parishads need to do more for conserving the environment. Under the 11th Schedule of the 73rd Amendment to the Constitution, PRIs have been assigned the function of taking care of the basic natural resources of the village – jal, jangal, jameen – or water, forest and land. They also get funds under the Integrated Watershed Management Program and the MGNREG Program to undertake projects to conserve or regenerate these natural resources, which are critical for the livelihoods of the rural population and indirectly even for the urban population as many of these resources (or their absence) affects urban populations too.

As part of the Panchayat Development Plans (PDP)[51], each panchayat should make a comprehensive five year plan for regenerating their water, forest and land resources in their jurisdiction and they must be required to submit a report on the progress made.

Likewise, under the 12th Schedule of the 74rd Amendment to the Constitution, Urban local bodies or Municipalities have been assigned the function of taking care of land use planning, water supply, sanitation, solid waste management and public health. They must thus prohibit dumping of solid waste, sewage and untreated industrial effluent in rivers and ban leaf fall burning. They must encourage composing food and organic waste, recycling plastic and other solid waste, treating sewage, establishing green belts, renovating water bodies for water harvesting and recharging groundwater.

They receive funds for these activities under the Swacch Bharat Mission and have been empowered to impose fines and take other civic action to prevent environmental damage. Each ULB should be required to come up with a five year City Development Plan[52], as was done under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in 2009-10, for the land and water resources and infrastructure development for public services in their jurisdiction and they must be required to submit a report on the progress made.

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[51] People's Plan Campaign https://gpdp.nic.in/

[52] City Development Plan Toolkit. https://localbodies.up.nic.in/Toolkit/CDP.pdf

4.3.2 Social and Economic Aspects

Under the 11th Schedule of the 73rd Amendment to the Constitution, PRIs have been assigned the function of taking care of poverty alleviation and welfare of the weaker sections in the panchayats, as well as run schools and primary health centres. Likewise, under the 12th Schedule of the 74rd Amendment to the Constitution, Urban local bodies or Municipalities have been assigned the function of taking care of slum upgradation, poverty alleviation and welfare of weaker sections.

Image Source

Programs have increasingly been funded for this like the National Social Assistance Program which provides pensions to the aged, the disabled and to widows. Under the Indira Awas Yojana, the rural poor are assigned houses its and given built houses. Under the PM Awas Yojana the urban poor are given subsidised long term housing loans. The National Rural and Urban Livelihood Missions are there to promote income generating activities for the rural and urban poor respectively.

The issue has been that these are all run by state government officials and the Panchayats are treated as last mile contractors. PRIs and ULBs must be given the power over the funds and functionaries to perform the functions assigned to them under the Constitution. We must learn the lessons from China in this regard – its county governments and city mayors wield enormous political and economic powers. They also raise the resources and in fact fund the higher tiers – provincial and central - governments

4.4 State and Central governments

Since the 1972 United Nations Conference on the Human Environment in Stockholm, a lot of progress has been made in environmental knowledge, legislation, regulation and preventive and promotional programs. Yet the fact of the matter is that the overall environmental situation has deteriorated since then. This may be due to the rising population, multiplied by rising per capita consumption levels and one could ask counter-factually what the situation would be if even the extant environmental knowledge, legislation and regulation was not there. Be that as it may, additional efforts will have to be made, and urgently to tackle the environmental crisis, both of global warming triggered climate change as also pollution and degradation caused by human and industrial activity.

The biggest issue is to develop a value for the long-term, inter-generational and "across all species" view of what is good, to replace the dominant short-term, "après moi le déluge", anthropocentric view. This requires more than knowledge – at least more than scientific and economic knowledge – it requires a different world view which values the natural over the man-made, spiritual over material progress and communitarian over individual prosperity. It requires the kind of thinking that Gandhi did in the Hind Swaraj in 1909, EF Schumacher did in Small is Beautiful – Economic as if People Mattered" in 1973 and what Gro Harlem Brundtland did in 1987 in the report "Our Common Future - From One Earth to One World.

4.4.1 Environmental aspects

The Central Government would have to significantly shift its policies from maintaining status quo as far as possible to championing change, as it has done in some aspects such as adoption of renewable energy. The fact that over 46% of India's energy generation capacity is now from renewable sources, though in terms of actual generation it is still only 22% is a good example. By dragging its feet over transition from coal, the Indian government wants to be on both sides of the fence.

By adopting 2070 as the date when India will become net zero in GHG emissions, when in 2024, the Earth has breached the 1.5 Celsius mark for global warming, India lost its moral standing while arguing for more funds for mitigation and adaptation at the COP29 at Baku recently for example. No amount of preaching adoption of an environmentally conscious lifestyle under the Mission LiFE cuts any ice in front of the fact that India is now the third largest emitter of GHGs. While we should continue to fight for climate justice, we cannot continue to add to the problems. It is our common future after all.

The Central Government must adopt fiscal policies which help environmentally challenged states more. Indeed, the Fifteenth Finance Commission added a criterion called forest and ecology with a 10% weightage, incentivising states for preserving and protecting forest cover and natural resources. (PRS India – Report of the 15th Finance Commission, 2021).[53] In addition, the Central Government must accelerate the cap and trade regime to establish a domestic carbon trading market, so that smaller players can benefit from their effort to reduce emissions or sequester carbon dioxide.

[53] PRS India (2021) Report of the 15th Finance Commission https://prsindia.org/policy/report-summaries/report-15th-finance-commission-2021-26

We have already indicated that the annual natural increment in the carbon stock in Uttarakhand's existing 2.34 million ha forests is worth at least Rs 4000 crore per annum in terms of carbon credits. If the forest are better managed, this number can increase further. Of course, to realise this revenue, the State Government will have to establish a special directorate for mobilising Carbon Finance, not just from the forest carbon dioxide sequestration but also other opportunities for Aggregated Micro carbon credits from Sequestration and Emission Reduction (AMSERs). These include farmers' agro-forestry and horticulture plantations, biogas plants and improved cookstoves. At least two NGOs, Nav Nirman Samiti in Nainital and Suvidha in Almora have already participated in such programs.

NABARD through its adaptation and mitigation measures has implemented a project under the Adaptation Fund of UNFCCC, in Champawat District with grant assistance of ₹5.36 crore. The project has benefited 800 households in 10 villages of 02 blocks in Champawat district. (NABARD, 2024, p. xi)[54] This type of project needs to be replicated in many more locations.

The state government has an important role to play both as key implementers of these programs as well as closer to the ground monitors of the environmental situation. For this they have to get off the view that higher GSDP growth rate is an unmitigated virtue. They must assess every growth proposal for what it does to the environment and what it does for jobs. The Environmental Impact Assessment reports should not be seen as mere formalities that have to be gone through to expedite "development", not should environmental activists be dubbed as anti-development. In addition the state pollution control boards need to be better equipped and empowered to monitor and if necessary penalise polluters. Investments in municipal and panchayat capacity in solid waste management and sewage and drainage, must be made.

4.4.2 Social aspects

That brings us to the social aspects. The budget outlays need to be increased for human development - nutrition, health, education and vocational training - as well as on institutional capacity building all the way from SHGs and cooperatives. We have estimated the outlay required for this in detail in the Table 35 above.

The hill states have always been the abode of peace and tranquillity and people came here for self-discovery and spiritual solace. Now, however, the erstwhile pilgrimages have become crowded tourism hotspots and the minority community, miniscule in number, is being hounded out with hate speeches, concocted accusations and fomented riots. The politics of divisiveness must be eschewed in pursuit of electoral gains.

While the ruling party and the central government has to ensure that the constitutional rights of all individuals are respected, the operationalization of this has to be managed by the state government. Calling the state "Devbhoomi" (the abode of Gods) and then using that to spread enmity with other religions is a short-sighted strategy for electoral gain and must be curbed under section 123 of the Representation of the People Act, 1951.

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[54] (NABARD, State Focus Paper for Uttarakhand, 2023-24, p. xi) https://www.nabard.org/auth/writereaddata/tender/2804235815SFP_Uttarakhnad.pdf

4.4.3 Economic aspects

The Central Government should use the opportunity to massively increase investments in regeneration of jal, jangal, jameen – water, forest and land. Elsewhere, we have estimated that Uttarakhand would need to invest Rs 23,283 crore in this. If it does that however, in addition to the environmental benefits, there are benefits in terms of generating employment for crores of people, particularly in rural areas, and of enhancing agricultural productivity and rural incomes, and reducing rural-urban migration. And to top it all, if the government chooses to establish a mechanism to aggregate the carbon sequestration and emission reduction credits that will arise from lakhs of households, farms and micro-enterprises, then some of the finance could also be raised from the international climate finance market.

The state government should promote industry and service enterprises in sectors and sizes that are in tune with the natural, human and financial resources of the state as we have recommended in the chapter 2, section 2.4 of this report. Certain types of manufacturing have been located, usually in the foothill districts, under the earlier regime of "backward area" incentives. These included pharmaceuticals, auto components and assembly units. There is a need to diversify beyond these both sectorally and spatially.

Taking advantage of the reach of the telecom signal anywhere, as also the plentiful availability of solar energy and hydel power, and an educated youthful population (though it will need further specialised training) the remote districts can be made into software hubs. For example, artificial intelligence based computer applications consume large amounts of energy and telecom data bandwidth. The remote districts can build a competitive advantage for these, provided investments are made first of all in educating the local youth to perform the technical tasks, and in the energy and telecom infrastructure.

Among services, tourism has been heavily promoted. Mass tourism has brought some income but also a lot of problems including over-crowding, defacing of hill-stations and tons of solid waste. It is time to diversify tourism, particularly to the more remote districts. This will also bring in higher end tourists and open up local jobs through home stays and support services. Even the mid altitudes can offer "experience tourism" such as plucking apples.

Image Source

4.5 International Cooperation – Regional and Global

Many of the problems of India's hill states are beyond their control and require not just support from the Central Government, but in some cases, most notably climate change, need international support. There are some issues such as water sharing of transnational rivers, which require regional cooperation.

4.5.1 Environmental aspect

Natural phenomena do not know humanly drawn boundaries. Climate change sweeps across national borders, just as cyclones and hailstorms, heat waves and earthquake tremors cross these without a visa.

It becomes necessary therefore to seek international cooperation – in monitoring, research, in prevention and mitigation where possible, and in disaster relief when adverse events do happen.

The most evident case for regional cooperation is about sharing of waters which flow across countries. Tibet is regarded as the roof of the world, is the source of two major south west flowing rivers – Indus and Sutlej and three east/southeast flowing rivers – Yangtze, Brahmaputra and Mekong.

The Tibetan plateau frequently experiences earthquakes as it is located over the tectonic plates. Construction of major dams by China, such as the Three Gorges dam and recently approved what will be the "largest dam in the world" on the Brahmaputra close to the Indian border,[55] can disrupt the seismic balance of the fragile Himalayan range.

Similarly, for Uttarakhand, rivers entering from Nepal such as Kali and Sharda are major rivers in the Kumaon region flowing from Nepal.

In these cases, India is the lower riparian state and thus must seek cooperation from China and Nepal, but in the case of the Teesta and the Ganga rivers, as also the Brahmaputra, which flow into Bangladesh, India is the upper riparian state and needs to negotiate water use with that country.

The much talked of the Indus Water Treaty of 1960 between India and Pakistan was hailed as an example of international cooperation and accommodation, though it has been re-examined now on the ground that India yielded too much.

These issues will have to be resolved through regional cooperation. India, for example, can use the Shanghai Cooperation Organisation (SCO) as a forum where it can raise the issue of the appropriate treatment of the Tibetan Plateau on environmental grounds.[56]

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[55] https://www.thehindu.com/news/international/china-defends-plan-to-build-worlds-largest-dam-over-brahmaputra-river-in-tibet-says-will-not-affect-lower-reaches/

[56] The SCO is an intergovernmental organization founded in 1996 by China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, and Uzbekistan to encourage regional cooperation. India was granted observer status in 2005 and became a full member in 2017. In 2022, India served as the President of the SCO.

Due to the impact of global warming, many of the glaciers, which are critical freshwater resources, are rapidly melting. According to the IPCC, "the Hindu Kush Himalaya could face the potential loss of more than two-thirds of Himalayan glaciers by the end of this century.

The UN declared 2025 as the International Year of Glaciers' Preservation an international conference is going to be held on the topic in Tajikistan starting 29 May 2025.

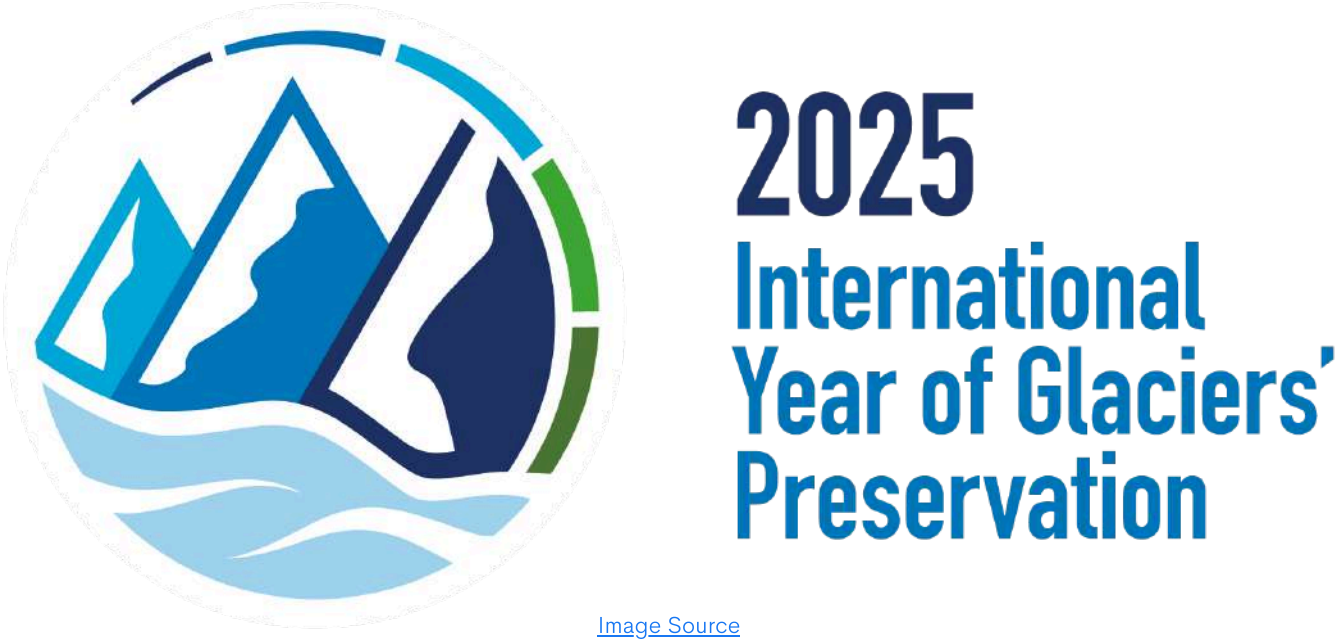

Image Source

As the conference announcement says:[57] "The ultimate objective is to ensure that individuals reliant on glaciers and snow, as well as those directly impacted by the Earth's cryospheric processes, receive hydrological, meteorological, and climate services specifically tailored to their needs. These services should acknowledge the vital role of mountain regions as the cradle of the cryosphere and the primary source of global freshwater and ecosystem services for the entire world".

The Government of Uttarakhand must send a strong delegation comprising scientific, administrative and political leaders to learn from the international deliberations on this topic.

Taking advantage of the decision of the global community at COP29 in Baku, under which the developed countries will give USD300 billion a year for climate change mitigation and adaptation.

The Government of India and the Government of Uttarakhand must set up institutional mechanisms to ensure that India and the state gets its fair share of this resource, and it is deployed to combat climate change. The funds that can be mobilised from carbon dioxide sequestration credits by the Forest Department is over and above this.

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[57] International Conference on Glaciers' Preservation, 2025 https://sdgs.un.org/partnerships/international-conference-glaciers-preservation-2025

5 Conclusion

This study was an attempt to take a comprehensive look at the environmental, social and economic situation of Uttarakhand and the lives and livelihoods of its inhabitants. Though there are numerous positives, there are a number of worrying trends.

At the environmental level, the biggest threat is the faster rate of glacier melting and increasing incidents of GLOFs in the state. Which is bound to cause reduction in the river flow and the resulting water shortages will have far-reaching effects. Research must be conducted on how to minimise the effect of global warming on glacial melt. Despite having enough water resources in the state, there is a huge shortage of water in certain areas for domestic use and irrigation. Studies have observed that Himalayan springs and perennial rivers are drying at a much faster rate.

Image Source

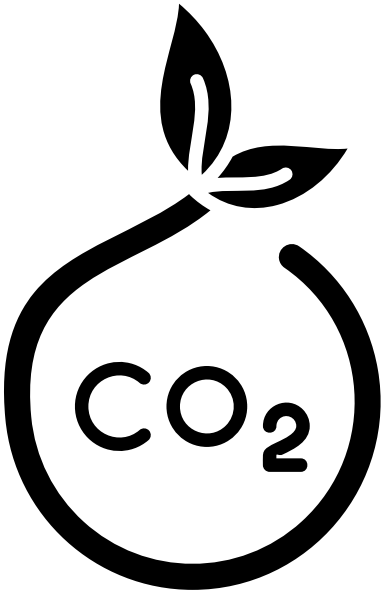
The data shows that the total forest area including forest outside recorded forest has marginally increased by 1.5% from 2001 to 2021. However, the quality of forest has degraded significantly in these two decades. In these two decades, the state has lost 1200 sq km dense and moderately dense forests. Probably most of these forests degraded to open forest with canopy density less than 40%, the forest land in this category having increased by 1567 sq km during the period.

Moreover, data shows that the ecological characteristics of forests in mountain regions are changing due to climate change and anthropogenic interventions. A large forest mixed oak forests in mountain districts have changed into monoculture pine trees leading to low amount of soil moisture, disappearing of many shrubs and trees essential for local subsistence. The government must come up with policies that encourage the owners of private forests to preserve them.

The soil quality in the cultivated area is deteriorating and needs farmyard manure and leaf compost. Over the last 2-3 decades the use of chemical fertilizers has alarmingly increased in the state. Moreover, a large number of people especially from mountain districts have abandoned their agricultural fields due to low productivity, shortage of water and threat from wild animals. As much as 10% people who migrated from mountain districts of Uttarakhand have attributed their distress migration to persistent loss in agriculture.

We have recommended a program for investing in the regeneration of Jal, Jangal Jameen and the government must act on it. We have recommended an investment over five years of Rs 6, 148 crore in the regeneration of water commons – glaciers, rivers, lakes, ponds; Rs 16,141 crore in the regeneration of forest commons including pastures and Rs 1,567 crore in regeneration of land common and private.

A large part of this Rs 23,856 crore will have to come from the government budget. The justification for this expenditure is that it will lead to an increase in the GSDP by Rs 5,821 in a five-year period and generate employment for 1.5 lakh persons. One new source of funds for environmental regeneration suggested by us is the sale of credits for carbon dioxide sequestration. We have estimated that Rs 1104 crore can be raised per annum from the sale of AMSERs in global carbon markets. This is a conservative estimate as the natural increment of carbon stock in the state's forest is worth Rs 4000 crore a year.



On the social front, the education system is in good shape except that the vocational component needs to be seriously enhanced from the present capacity of 6000 per annum to about ten times as much. In addition, specialised skill programs must be organised for sectors such as organic agriculture, renewable energy, waste recycling, electronic manufacturing, software including artificial intelligence applications, and eco-tourism. In the health system, the shortage of specialist doctors outside big towns must be made up through a chain of telemedicine outlets.

Lifestyle improvements must be part of the public health messaging as diabetes and hypertension seems to be affecting a significant part of the population. On the social front, cohesion and trust must be built and right-thinking citizens need to take action to confront individuals who use divisiveness for political gains. Panchayats, Zilla Parishads and Municipalities must become more participatory, transparent and accountable and civil society institutions will have to take the lead in this.

We have recommended an investment of Rs 17,149 crore over the next five years for social development. Of this, Rs 12,170 crore is for upgrading of nutrition, healthcare, education, skill development services; and Rs 4,979 crore is for strengthening social capital by investing in households, neighbourhood communities and local participation institutions such as self-help groups and resident welfare associations, school management committees and hospital management committees and van panchayats.

We have also recommended support to civil society institutions as only they can organise community-based institutions effectively. We have emphasised institutional development of panchayats, zilla parishads and municipalities by fgreater devolution of funds, functions and functionaries from the state government.

This investment will rebuild the eroded social capital in rural areas, impacted by the environmental and livelihoods crisis leading to migration. It will also help to build afresh the social capital badly needed to run the cities in the state as it urbanises. As cities tend to have a much more diverse and mobile population, deliberate efforts must be made to build social capital. This will positively impact the governance of municipal bodies as also most of the newly created sectoral institutions which are mostly located in urban areas.

For the third prong of the NEW strategy, Well-th creation, we argue that both the agriculture and allied sector as well as the manufacturing and services sector in Uttarakhand will have to upgraded significantly so that they can cater to changing local demand and also to demand from metro and exports. This will mean new products and services, which will need more capital equipment, more skilled manpower and a supportive eco-system.

For agriculture, we have recommended investment of Rs 20,624 crore over five years, largely funded by bank loans, to upgrade approximately 9.12 lakh farms in Uttarakhand. As the state has nearly 5.3 lakh sub-marginal (below 1 acre) holdings, we have recommended that they be encouraged to cultivate flowers, spices, medicinal and aromatic plants, mushrooms and bee-keeping. Marginal and small farms need to be assisted in enhancing productivity through soil and water conservation, irrigation, greenhouses, growing cereals and vegetables for local markets.

To accelerate the transition of employment from agriculture to the non-farm sector, the MSMEs of Uttarakhand will have to help to move to the next orbit of productivity as well as products. We have recommended that 4.76 lakh own account enterprises (OAEs) which employ only the owner-entrepreneur and their family members, 0.64 lakh OAEs in household manufacturing and 4.12 lakh OAEs in trade and services be upgraded with better equipment, quality ingredients and more skilled owner-entrepreneurs. This will also require a lot of technical inputs, support services as well as market linkages, all of which will create more jobs and more income. For this an investment of Rs 20,624 crore has been recommended, largely from banks and own funds.

In addition to the above 4.67 lakh OAEs, Uttarakhand has about 1.09 lakh hired worker enterprises (HWEs), of which only 16,547 are in manufacturing while the rest are in trade and services. These HWEs will have to be upgraded with better equipment, quality ingredients and more skilled workers. For this an investment of Rs 84,715 crore has been recommended, largely from banks and own funds.

The NEW strategy will ensure that benefits of the investment accrue in terms of:

- Nature regeneration will yield environmental benefits in terms of more availability of clean water, less impact of monsoon failure or other adverse events, increase in green cover, production of more nutritious food crops with less chemical intensity, and reduction in GHG emissions as also carbon dioxide sequestration, which if aggregated as AMSERs and sold in the global carbon markets will fetch Rs 3,908 crore.
- Enabling social development will yield Health and Education improvements which will greatly enhance citizens' quality of life and increase in their healthy active life years. They will be more productive and thus be able to earn more and will live and work together more harmoniously.
- Well-th creation will lead to inclusive economic growth in both the agricultural sector, all the way from marginal farmers to larger commercial farmers, and in the non-farm sector, all the way from own account enterprises to larger hired worker enterprise.
- We estimate that due to these investments of Rs 146,344 crores over five years, the GDP will grow, and this investment will add Rs. 28,541 crore over and above normal growth of state GDP. More importantly it will be more diversified sectorally and geographically and be more inclusive covering women, the marginal farmers and landless, and micro-entrepreneurs. About 5.15 lakh new remunerative jobs will be created.

We have ended the report with a call to action at five levels, covering environmental, social, and economic aspects:

- Individuals by themselves; as citizens, as activists, as thinkers and influencers
- Individuals by joining local Social Groups/NGOs/Civil Society Institutions
- Gram Panchayats/Zilla Parishads/Town Wards / Municipalities
- State and Central Government departments and specialised agencies
- International Cooperation at the Regional and Global level

We have no doubt that if the recommended NEW strategy is followed, we will see the dawn of Hara Bhara Suraaj. Uttarakhand will become green, fulfilled and well-governed.

6 Appendix 1 - Status of Environment in Uttarakhand

Uttarakhand is an important state in the western Himalaya that has enormous natural wealth in the form of water, forest and land. These natural capitals are crucial for the sustainability of the Himalaya and life and livelihoods of its people. The total geographical area of the state is 55,483 sq km, out of which more than 68% (i-e 38,000 sq km.) area is under forest cover.

Of the total landmass of the state, 14% area is under agriculture, most of which is concentrated in Tarai and Bhabhar region of Uttarakhand. The state is also very rich in water resources, which receives about 48,352 MCM water annually through precipitation. Moreover, it has a network of more than 213 rivers and 14,000 glaciers.

The ecological services provided by the enormous natural wealth located in the state directly benefits more than 1 billion people of the state and many more in the Gangetic plain. Most of this natural wealth – Jal (water), Jangal (forests), Jameen (land/soil) and Jalvayu (climate) are under crisis due to excessive anthropogenic pressure and climate change. This chapter very briefly highlights the state of various natural resources of the state and articulates major challenges faced by them.

6.1 Jal- State of water resources in Uttarakhand

Uttarakhand has huge networks of rivers, large number of glaciers, vast area under snow cover and long rainy seasons both during monsoon and winter making it a water surplus state. The annual precipitation provides about 48,352 MCM water to the state, other sources such as glaciers, snow, water inflow from other countries and groundwater aquifers further increases the water availability in the state. According to an NMCG survey there are five major river basins namely Alaknanda, Bhagirathi, Sharda, Ramganga and Yamuna. These major river basins cover the entire geography of the state with the network of 213 small and medium size perennial rivers and streams.[58]

The average annual rainfall in Uttarakhand is 1700 mm, however it varies from district to district. According to a report of NGWB, average rainy days in summer and winters are 120 and 60 respectively. The south west monsoon adequately showers the state including heavy rainfall in mountains. Due to steep slopes, the runoff is very high in mountainous districts of the state. However, good quality oak forests in the mountains are crucial in slowing down runoff, soil erosion and recharging local springs and water sources.

All rivers in the state are perennial, fed by glaciers. However, a large amount of water sourced by these rivers is from underground seepage accumulated by rich forest diversity in the state. The geohydrology of the state is largely divided in two categories namely Gangetic Alluvial Plain and the Himalayan Mountain Belt.

[58] National Mission for Clean Ganga: Uttarakhand River Atlas, August 2021: https://iwis.cganga.org/wp-content/uploads/2022/11/UK-River-Atlas-Report_Lowres.pdf

Table 16 Major Water Statistics of Uttarakhand

Number of major river catchments	Number	04
Number of Rivers	Number	213
Watersheds	Number	8
Sub-watersheds	Number	116
Micro-watersheds	Number	1110
Average annual Rainfall	MM	1700
Precipitation (including Snowfall): (MCM)	MCM	48351.82
No of Glaciers	Number	14000
Number of glacial lakes	Number	1353
Number of Permanent snowfields	Per cent	10% of TGA

Source: compiled from different Govt sources

The Gangetic alluvial plain is in the south most portion of the state which is the part of Indo-Gangetic Foreland basin. The large part of the state geography is part of the Himalayan Mountain Belt, which is further sub-categorized in four zones. The south most sub-zone adjacent to the Gangetic alluvial plain is called Sub-Himalaya or Outer Himalaya which is at the elevation of 250 to 800 m above mean sea level. Doon valley is part of the outer Himalaya. Moving northwards the second zone is Lesser Himalaya that covers areas such as Almora, Baijnath and Askot. Central Himalaya and Tethys Himalaya are top two geo hydrological zones of Uttarakhand.[59]

[59] Central Ground Water Board- Ground Water Year Book (2020-21), Uttarakhand: https://www.cgwb.gov.in/old_website/Regions/UR/Reports/Ground%20Water%20Year%20Book%202020-21%20Uttarakhand.pdf

6.1.1 Water challenges in Uttarakhand

The abundance of water resources in the state was re-planned about two decades ago to utilize it for local social and economic development. This plan was executed under the traditional development model that believes in generating wealth through mega projects. Many hydro power projects were initiated in the last two and half decades in the state to tap the hydro power generation potential of its hundreds of rivers.

Uttarakhand government has estimated that its rivers have potential to generate 24,551 Mega Watt electricity. Apart from already functional hydro power projects, 87 more projects are in different stages of construction in the state. This over emphasis on hydro power projects has grossly undermined the flow of rivers. Effectively, the hydro power generation has overshadowed all other social, economic and environmental usage of water in the state.

Apart from hydro power generation, water demand for agriculture and domestic use is significant. However, both these sectors are facing challenges to meet existing demand. Nearly 5.4 lakh hectare agriculture land has potential for irrigation in the state which constitutes about 34% of the total land under agriculture in Uttarakhand. However, the irrigation department of Uttarakhand has developed irrigation capacity for only 4.48 lakh hectare despite having enough water in the state. Similarly, in rural areas, state government is able to supply only 529 MLD as against demand of 663 MLD of drinking water. Similar[60] gaps also exist in demand and supply for drinking water in urban areas.

Water streams and local water sources such as Naula, Dhara and Gadhera are important sources of water for domestic purposes and livestock use. These water sources supply more than half of total rural water demand. In mountain districts these sources are very high. In some districts like Chamoli, Rudraprayag, Pithoragarh and Uttarkashi these water resources supply 100% of the water required for domestic use.[61] According to a NITI Aayog report (2018),[62] there are nearly three million springs in the Indian Himalayan Region. However, these water sources are gradually drying-up due to deforestation, changing characteristics of the local ecosystem and habitation extension. The Central Ground Water Board has also observed that the water level in streams monitored by it are immensely fluctuating. [63]

Climate Change is yet another major factor affecting the water resource of the state. Various studies have observed that glaciers are receding at a very high rate, the tree line is moving upward changing the ecosystem of Himalayan alpine and permanently snow-coveredareas. With the increase in temperature, incidents such as Glacial Lake Outburst Floods (GLOFs) are very common.[64]

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[60] Irrigation Research Institute, Roorkee, State Specific Action Plan for Water Sector, 2018, Uttarakhand: https://nwm.gov.in/sites/default/files/Report_Draft-SSAP_Uttarakhand.pdf

[61] Irrigation Research Institute, Roorkee, State Specific Action Plan for Water Sector, 2018, Uttarakhand: https://nwm.gov.in/sites/default/files/Report_Draft-SSAP_Uttarakhand.pdf

[62] Govt of India, Ministry of Rural Development, Dept of Land Resources, Springsheds https://dolr.gov.in/springshed/

[63] Central Ground Water Board- Ground Water Year Book (2020-21), Uttarakhand: https://www.cgwb.gov.in/old_website/Regions/UR/Reports/Ground%20Water%20Year%20Book%202020-21%20Uttarakhand.pdf

[64] Laurent Benjamin, Receding Glaciers Threaten Uttarakhand Residents' Electricity and Homes, Earth Refugee, April 08, 2021: https://earthrefuge.org/receding-glaciers-threaten-uttarakhand-residents-electricity-and-homes/

The Kedarnath flood in 2012 and the Vishnupryag flood in 2021 are two recent devastating GLOFs the state witnessed.

Uttarakhand, despite being a water rich state, has a very uneven distribution of water for various uses. The overemphasis of the state on hydro power generation has grossly undermined sectors such as drinking water, irrigation, river fishing and other recreational activities. Our water infrastructures are not capable of meeting water demand for irrigation and domestic use. Over and above, all major water sources in the state such as rivers, glaciers and streams are threatened by climate change and unregulated development.

6.2 Jangal- State of forests in Uttarakhand

Forests in Uttarakhand are an integral part of subsistence living, moreover, from the early twentieth century the then British government started developing it as a key revenue source for the government. The colonial government developed a profit-making business around forest resources such as timber, wood for railway track and resins. To promote this forest-based business and industry, the then government promoted plantation of economically beneficial tree species such as Chir pine, teak, sheesham and eucalyptus. These economic activities continued even after independence in 1947. However, more recently more activities have been added to broaden forest-based revenue of the state government. These activities include collection and trade of herbs and likens. Moreover, the government has earned a lot by diverting forest land for non-forest purposes after commencement of the Forest Conservation Act, 1980.

The commercialization of forest land and its products have grossly changed the local ecosystem and characteristics of forests. Forests at the elevation of 700 metres and above are in two broad categories namely Subtropical Pine Forests (mixed forests) and Himalayan Moist Temperate Forests (oak forests). These two categories of forest are the backbone of mountain life and livelihood as they provide fuel, fodder, grazing, water and other MFP to villagers. These forests account for nearly 39% of the total forest area. The Chir pine found in the Tropical Dry Deciduous Forest which was promoted and planted initially by the British and continued after independence accounts for more than 15% of the total forest land.

6.2.1 Drastic changes in ecosystem of forests

Chir pine has proved to be a dominating species in the mountains and created existential threats to local oak and mixed forests in Uttarakhand. Gandhian activists late Smt. Mira Mahen in 1952 raised the issue of invasive characteristics of Chir pine and wrote to the then Prime Minister Mr. Jawahar Lal Nehru. She argued that the promotion of Chir pine has not only deteriorated the local ecosystem but also led to social fragmentation.[65] These trends are continuing as a recent study observed that from 1991 to 2001 in the region of Almora and Nainital 18.2% dense oak forest converted into Chir forest. Similarly, 7.4% dense oak forest degraded to Chir forest from 2001 to 2017 in the same region.[66]

The changing characteristic of forests in Uttarakhand is a serious concern as it has disrupted the subsistence living in all mountain districts of Uttarakhand. Moreover, Chir forest has also changed the regulation of ecosystem services such as water. Chir forests are dryer compared to oak forests. Expansion of Chir forest is making the region dryer and contributing in drying of mountain water streams. These forests are more prone to forest fires in the state. Mongabay carried a report (Megha Prakash, 2024)[67] which said that Uttarakhand had experienced widespread forest fires. From November 2023 to June 2024, there were 11,256 forest fire incidents, affecting 11 out of 13 districts.

The Uttarakhand Forest Department receives forest fire alerts from the Forest Survey of India (FSI), which detects fire locations using the Moderate Resolution Imaging Spectroradiometer sensor, used on NASA's Terra and Aqua satellites to gather data about Earth's surface and atmosphere. Pre-warning alerts were piloted in Uttarakhand since 2017.

The Forest Department also utilizes a Forest Fire Alert App and have quick response teams in place. (UFD, 2024)[68].It has established a Master Control room with wireless communication. There is a network of crew stations, each with 4-5 Fire Watchers equipped with firefighting tools and wireless communication network. They are who respond to each fire incident.

[65] Guha Ramachandra, 2006, 'How much should a person consume? Thinking through the environment', Permanent Black.

[66] Das Arundhati, et al, 2021, 'Expansion of pine into mid-elevation Himalayan oak forests: Patterns and drivers in a multiple use landscape, Forest Ecology and Management 497(2021)

[67] Megha Prakash (2024), https://india.mongabay.com/2024/08/uttarakhand-forests-burn-while-fire-guards-face-outstanding-salaries-and-lack-of-resources/

[68] Uttarakhand Forest Department, Forest Fire Management, https://www.ukforest.in/FFRMS/fire/

Table 17 Species wise forest classification in Uttarakhand

Species	Area	% to TFA
Sal, Teak, Sissoo, Eucalyptus	375585.89	14.51
Oak	383088.12	14.8
Mixed	614748.59	23.77
Chir Pine	394383.84	15.25
Other (Deodar, Blue Pine, Fir, Spruce, Cypress)	132762.13	5.44
Waste Land/ Empty land	685749.43	26.52
Total	2586318	100.29

Source: Uttarakhand Forest Statistics (2014-15) ,GoUK

6.2.2 Mis governance of forests and its resources

The change in forest ecosystems and their characteristics is very much dependent on forest governance. In Uttarakhand the state forest department has administrative control over only 64% of the total forest area. A substantial area under forest i-e 19% is under the control of Van Panchayats. These Van Panchayats are community based institutions responsible for protection and conservation of forests and equitable distribution of forest resources. The incentive of these Van Panchayats is in oak and mixed forest which provides fuel, fodder and grazing to local communities.

Table 18 Forest Administration in Uttarakhand

Administrative Control	Area (sq. km.)
Forest under administration of the State Forest Department	24,418.67
Forest under administration of Van Panchayats	7,210.19
Forests under administration of the State Revenue Department	4,768.7
Forests under other agencies	157.51
Non classified forests	1,444.51
Total	37,999.58

Uttarakhand Forest Statistics (2014-15), GoU

According to forest statistics published by the state government both mixed and oak forests are in much better condition compared to Chir pine forest in the state. More than 72% of these two categories of forests are either very dense or moderately dense.

On the other hand, Chir pine forest which is largely governed by the state forest department and where communities have no incentives has less than 60% area either in dense or in moderately dense forests.

6.2.3 Unaccounted forests

According to ISFR the total forest land in the state is 38,000 sq km which accounts for 68.48% of the total landmass of Uttarakhand. However, as per the same survey report the recorded forest in the state is only 16,785 sq km. The forest or green cover outside recorded forest is 7,520 sq km. Of the total recorded forest in Uttarakhand, the Forest Survey of India has no data for 21,215 sq km (55.8%).

Table 19 Status of Forests in Uttarakhand

Forest Status	Area (sq km)
Total Geographical Area of Uttarakhand	55,483
Total Recorded Forest	38,000
Actual Forest Cover in Recorded Forests	16,785
Actual Forest cover in Forest outside Recorded Forests	7,520
Un Accounted Forests (missing forests) (2-3)	21,215

Source: ISFR, 2021

A lot of this forest land is empty and wasteland such as snow-covered areas, glaciers, mountains, water bodies and pasture land. According to the state forest department the total waste/empty forest land is 6,857 sq km.[69]

Yet a very large forest land is still unaccounted for in records of the state forest department and Forest Survey of India. In absence of data, its vegetation and wildlife a large portion of the forest land remain unplanned.

6.2.4 Degradation of forests

The state of forest survey reports published by the Forest Survey of India has been keeping records of Uttarakhand forest from 2001 after formation of the state in 2000. The data shows that the total forest area including forest outside recorded forest has marginally increased by 1.5% from 2001 to 2021.

[69] Govt. Of Uttarakhand- Uttarakhand Forest Statistics (2014-15), Forest Department, Uttarakhand: http://www.uafdc.in/acts&rules/forest_statistical_2014-15.pdf

However, the quality of forests has degraded significantly in these two decades. In these two decades, the state has lost 1200 sq km dense and moderately dense forests. Probably most of these forests degraded to open forest with canopy density less than 40%, the forest land in this category having increased by 1567 sq km during the period.

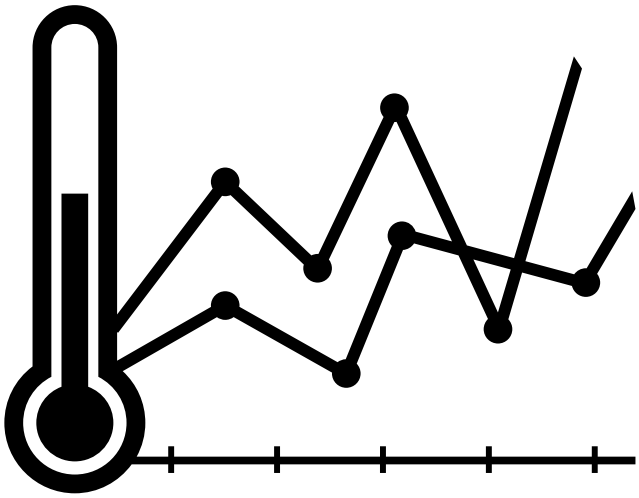
Table 20 Quality of Forest in Uttarakhand

Year	Total Forests	Dense Forest (Canopy Density more than 40%)	Open Forest (Canopy density between 10 to 40%)
(area in sq km)			
2001	23,938	19,023	4,915
2011	24,496	18,929	5,567
2021	24,304	17,823	6,482

Compiled from various ISFR

Uttarakhand government as a trustee of its rich forest cover has been advocating for financial incentives from the government of India. However, its forests are facing two major challenges. One, the density of its forests is continuously deteriorating; two, the ecological characteristics of its mountain forests are changing due to the invasive nature of pine trees and climate change. In the last two decades, despite heavily regulated forests, a significant landmass has converted from dense forest to open forests.

On the other hand continuous upward movement of pine forests is replacing mixed forests and oak forests in the mountain district. The invasive nature of the pine tree and decreased forest governance role of local communities has led to this change unchecked. These challenges together have further intensified problems relating to soil erosion, surface runoff, shortage of fuel & fodders, forest fires, drying of water streams, upward movement of tree line occupying alpine rangelands and wildlife habitat. To address these challenges, we need quality data; however, the government has no data for more than 55% forest land.



6.2.5 Carbon sequestration by forests- A potential source of income

As per the chapter on Carbon Stocks in the India State of the Forest Report (ISFR, 2024)[70], Uttarakhand has 2.43 million ha of forests and these together have a carbon stock of 378 million tons of carbon in terms of above ground biomass, below ground biomass, deadwood, litter and soil organic carbon, the last being the maximum share of the total.

As per the section 9.5 of the ISFR, over 10 years, the national carbon stock has increased by about 8.1%, which means roughly 0.67% per annum increase.

Thus, the Uttarakhand carbon stock increases naturally under current conditions by about 2.5 million tons of carbon a year, which is equivalent to 9.2 million tons of carbon dioxide worth a minimum of USD 40 or Rs 3400 per ton of carbon dioxide, or a staggering Rs 3128 crore a year.

If the Forest Department realises this and improves its management of forest, it is quite capable of earning Rs 4,000 crore a year, which would raise a lot of resources for forest regeneration. Something big needs to be done to actualise this possibility.

Image Source

[70] ISFR (2024). Carbon Stock in India's Forests https://fsi.nic.in/isfr-2021/chapter-9.pdf

6.3 Jameen - State of land in Uttarakhand

Nearly 70% of the total geographical area of the state is under forests and about 29% of the state is culturable and cultivable land. However, the net area under agriculture is about 14% of the total geographical area of the state. Nearly 70% of the population is dependent onthis small proportion of land for their livelihoods. The cultivable land distribution is uneven in the state. Nearly 70% of the landowners in the state hold land less than 1 hectare. These 70% farmers share only 27% of the total agricultural land in the state. However, 22% of the total agricultural land is possessed by just 3% landowners in the state.[71]

The very small land holding and fragmented land holding makes agriculture an expensive enterprise especially in hilly districts of Uttarakhand. The labour intensity in hilly agriculture is much higher compared to agriculture in bhabar and *Tarai* regions of the state. Moreover, decreasing productivity due to loss of soil nutrient, climate change and destruction by wild animals such as monkeys and beer makes agriculture even more vulnerable in the state. According to statistics of the State Migration Commission in 2019, the major reasons for distress migration in Uttarakhand are livelihoods (50%), poor education and health (15%) and loss in agriculture (10%).

The impact of climate change, decreasing soil nutrient, attack of wildlife, fragmented land holding and insignificant average land holding are some reasons which have made farming expensive, labour intensive and a loss making livelihood.Marginal farmers who account for about 70% of the total land owners are increasingly finding it difficult to continue agriculture in the state.

6.3.1 Land utilization and agricultural production

Data related to land use in the first two decades further confirm this statement. The fallow land has almost doubled from 1.7 ha in 2000-01 to 191 ha in 2020-21. Consequently, the net sown area and total cropped area has also decreased significantly in their period. Farmer's ability to draw more than one crop has also decreased significantly in these two decades.

Image Source

[71] Govt. Of Uttarakhand, Uttarakhand State Perspective and Strategic Plan (2009-27), Watershed Management Directorate, Dehradun: http://wmduk.gov.in/Perspective_Plan_2009-2027.pdf

Table 21 Classification of Land of Uttarakhand (,000 Hectare)

Year	Land Not available for Cultivation			Other Uncultivated Land Excluding Fallow Land	Total Fallow Land	Net Area Sown	Cropped Area	Area Sown more than once
	Area under Non Agricultural Uses	Barren and Un culturable Land	Total					
2000-01	152.2	310.2	462.4	866.7	107.4	769.9	1222.3	452.3
2010-11	217.6	224.8	442.4	894.4	127.7	723.1	1169.6	446.5
2020-21	188.3	249.3	437.6	940.5	191.0	620.6	996.8	376.1

Compiled from various Agricultural Statistics at a Glance Report: https://desagri.gov.in/

Wheat and Rice have taken over a variety of millets as the main crop of Uttarakhand over the decades. More than 60% agricultural land in the state is under food grains such as wheat and rice. A sizable land is under vegetable cultivation.

Other than horticulture, the area under every crop has decreased in the last two decades in Uttarakhand. Area under millet cultivation has observed the sharpest decline of about 46%, which has decreased from 293 thousand hectare in 2004-05 to 158 thousand hectare in 2022-23. The area under food grains has also decreased from 10.38 lakh hectare to 7.57 lakh hectare (27%).

Table 22 Area under principal crops in Uttarakhand (in thousand hectares)

Year	Millets	Pulses	Food Grains	Fruits	Vegetable
2004-05	293	45	1038	201	72
2009-10	271	64	1009	193	82
2014-15	222	67	897	205	100
2019-20	182	60	805	181	99
2022-23	158	63	757	181	100

6.3.2 State of soil in Uttarakhand

Uttarakhand is divided into four different agro climatic zones formed with different types of soil and therefore creates a range of geological and hydrological formation across the state. The first agro-climatic zone, which comprises areas of Bhabhar andTarai parts of Champawat, Dehradun and Nainital district is formed of alluvial soil. These regions are favourable for cultivation of rice, wheat, sugarcane, mango, litchi and guava.

The second agro climatic zone is at an altitude between 1000 to 1500 msl and is formed of sandy loam soil. This zone is also called mid hill south zone and is favourable for cultivation of rice, wheat and finger millets. This zone is north of the Tarai and Bhabar region of Uttarakhand and comprises parts of Dehradun, Champawat, Nainital, Almora and Tehri district of the state.

Soil in the remaining two agro climatic zones of the state is red to dark and black clay. This climatic zone is at the altitude of 1500 msl and above. All hilly districts of the state have these two agro-climatic zones. These two zones are favourable for cultivation of many local millets Amaranth and finger millet and fruits like apple and pears.

Image Source

Table 23 Agro-climatic zone of Uttarakhand

Zone	Farming situation	Soil	Districts	Principal farm produces and Livestock
Zone A up to 1000 M	Tarai irrigated	Alluvial	U.S. Nagar, Haridwar	Rice, wheat, sugarcane, lentil, chickpea, rapeseed mustard, mango, Litchi, guava, peach and plums. Livestock: Buffalo and cattle
	BhabarIrrigated	Alluvial mixed with boulders and shingles	Nainital, Dehradun and Pauri Garhwal	Rice, wheat, sugarcane, rapeseed mustard, potato, lentil, mango, guava and litchi. Livestock: Buffalo and cattle
	Irrigated lower hills (600-1000M)	Alluvial sandy soil	Champawat, Pauri Garhwal, Dehradun, Nainital, Tehri Garhwal	Rice, Wheat, onion, chilly, peas, potato, radish, cauliflower, pulses, oilseeds, soybean, mango, guava, plums and peaches.Livestock: Buffalo and cattle
	Rain-fed lower hills (600-1000M)	Residual sandy loam	Champawat, Nainital, Pauri Garhwal, Dehradun, Tehri Garhwal, Bageshwar	finger millet, Maize, rice, wheat, pulses, mango, guava, plums and peaches.Livestock: Buffalo, cattle and goat
Zone B1000-1500M	Mid hills south aspect (1000-1500 M)	Sandy loam	Champawat, Nainital, Almora, Dehradun, Tehri Garhwal, Bageshwar	Rice, finger millet, wheat, potato, tomato, peas, cole crops, pulses, peach and plums.Livestock: Cattle, sheep & goat
Zone C1500-2400M	High hills(1500-2400 M)	Red to dark	Pithoragarh, Almora, Chamoli, Bageshwar	Amaranth, finger millet, French-beans, Cole crops, potato, peas, peaches, plums, pear, apple and stone fruits.Livestock: Cattle, sheep and goat
Zone D>2400 M	Very High hills	Red to dark Black clay	Pithoragarh, Chamoli and Uttarkashi	Amaranth, buckwheat, peas, Cole crops, apple and potato.Livestock: Sheep & goat

State Horticulture Mission, Uttarakhand: https://shm.uk.gov.in/pages/display/6-state-profile

6.3.3 Oil nutrient and fertilizers

The decreasing soil nutrient in Uttarakhand is a big concern like in other parts of the country. It has further increased the cost of agricultural input such as fertilizers, pesticides and seeds. The tradition of local seed conservation has taken over the market leading to much unpredicted production. The use of chemical fertilizer has also increased drastically in the state in the last couple of decades. Per hectare use of chemical fertilizer in Uttarakhand is very high compared to other states in western Himalaya namely Himachal Pradesh and Jammu & Kashmir.

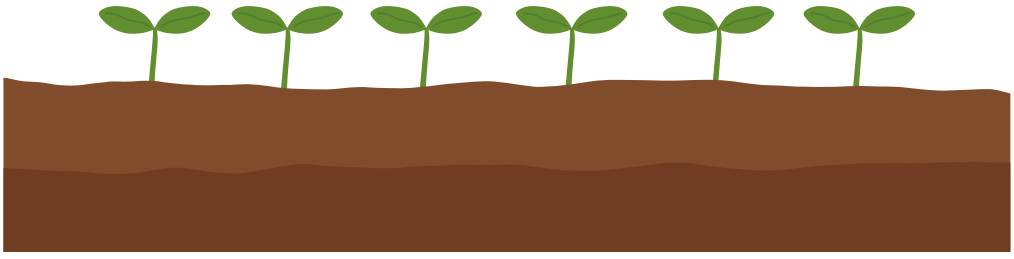
Table 24 Fertilizer Consumption per Unit of Gross Cropped Area in Uttarakhand

Year	Nitrogenous (N) (kg/ha)	Phosphatic (P) (kg/ha)	Potassic (K) (kg/ha)	Total (NPK) (kg/ha)
2006-07	87.4	20.6	7.27	115.35
2009-10	115.4	29.6	10.26	155.3
2014-15	128.9	24.1	6.88	160.0
2019-20	123.8	30.73	8.81	163.4

Compiled from various Agricultural Statistics at a Glance Report: https://desagri.gov.in/

Fertilizers and other market solutions for mountain agriculture have helped in production and per unit yield in the last couple of decades. The yield of food grains has increased from 622 kg /hectare in 2004-05 to 958 kg per hectare in 2022-23. Similarly, yield enhancement was observed in millets and pulses as well.[72] Despite the growth in yield, many people have deserted their fields and abandoned agriculture due to many reasons discussed above including decreasing soil nutrients and increasing input cost.

The Government of Uttarakhand has pushed for organic production and natural farming through various schemes, projects and legislation. In 2019 the state government enacted legislation to regulate and promote organic farming and production. In 2023-24, Uttarakhand had 51,628 hectare land under organic certification. In that year, the state's organic production was 44,745MT.[73] Compared to other states in the western Himalaya, Uttarakhand has moved ahead in terms of recognizing the crisis of soil nutrient and took steps to reclaim its soil.



[72] RBI, Handbook of Statistics on Indian States (2022-23) , Reserve Bank of India

[73] Agricultural and Processed Food Products Export Development Authority (APEDA), Government of India: https://apeda.gov.in/apedawebsite/organic/data.htm

6.4 Jalvayu- State of climate in Uttarakhand

The temperature in Uttarakhand varies significantly from place to place due to sudden changes in elevation and diversity in locations, slopes and topography. The temperature in the state starts to rise from March and peaks in May and June.

The southern part of the state namely Bhabhar and Tarai region are hotter compared to mid and high Himalayan regions. The summer mean maximum temperature of southern Uttarakhand and valleys is equivalent to summer mean maximum temperature of areas at the elevation above 2000 meters. According to the state climate action plan (GoU, 2014)[74] the temperature has been increasing in western Himalaya. According to the plan document, the net increase in regional temperature is in the range of 1.70 C to 2.20 C in 2030 with respect to 1970.

Table 25 Mean Maximum and Minimum Temperature in Summer and Winter

	Summer		Winter	
Location	**Mean max**	**Mean min**	**Mean max**	**Mean min**
Southern Uttarakhand and Valleys	340C-380 C	200 C-240 C	200 C	60 C
Places at about 2000 m altitude	230 C-240 C	150 C	100 C-120 C	10C-30C

Source: Compiled from India Meteorological Department, 2014, Climate of Uttarakhand
https://www.imdpune.gov.in/library/public/Climate%20of%20Uttarakhand.pdf

The annual average rainfall in Uttarakhand is about 1330 mm, however it varies from district to district. Almora receives minimum rainfall with an annual average of 966 mm and with annual rainfall average of 1775 mm Pithoragarh district receives maximum rain in the state.

The precipitation is in the form of rainfall and snow. However, snowfall is limited to high altitude regions from December to February every month. Annual average rainy days in Uttarakhand are 63, which are highly concentrated in months of June, July, August and September. Rainy days in winters are also significant in the state (16%).[75]

The state action plan for climate change has reported that the average rainfall is on the increase. According to their estimate the net increase in rainfall in 2030 will be 60mm to 206mm with respect to average annual rainfall in 1970. It further provides that the monsoon rainfall will increase by 12mm and winter rainfall will increase by 5 mm in 2030. Moreover, some areas of Uttarakhand will even see net rainfall increase of 50% with respect to average rainfall of 1970.

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[74] GoU (2014) Government of Uttarakhand- Uttarakhand Action Plan on Climate Change, 2014: https://forest.uk.gov.in/uploads/climate_change_information/1616764235.pdf

[75] India Meteorological Department, 2014, Climate of Uttarakhand: https://www.imdpune.gov.in/library/public/Climate%20of%20Uttarakhand.pdf

6.4.1 Impacts of climate change on natural wealth of Uttarakhand

Receding Glaciers: Uttarakhand has nearly 900 glaciers supplying water to hundreds of its perennial rivers and streams. Various studies show that these glaciers are melting at alarming rate due to climate change and increase in global temperature (Thakur, 2024)[76]. The Gangotri glacier is retreating at the rate of 19m per year. Other important glaciers such as Pindari, Milam, Dokriani, Chhanguch, Thelu and Raktavama are also retreating at very high speed. The Chhaguch glacier is retreating at the rate of 85 m/ year (GoU, 2014).[77]

Increasing Incidents of GLOF: Glacial Lake Outburst Flood (GLOF) is increasingly becoming a major cause of disaster in the state. The Kedarnath flood in 2013 and Dhauli Ganga flood in February 2021 are two recent examples of devastating GLOFs. Both of these disasters were massive and took the lives of hundreds of people. Studies shows than due to climate change and increase in temperature in Himalaya, many glacial lakes are expanding which increases possibilities of their outburst (IIRS, 2022).[78]

Land Degradation and Desertification: According to the Desertification and Land Degradation Atlas of India, 6.48 lakh hectare land of Uttarakhand is under desertification and land degradation. This landmass is 12.12% of the total geographical area of Uttarakhand (ISRO, 2016).[79]Degradation of vegetation is the most prominent factor responsible for land degradation and desertification in the state. According to the atlas, this factor is responsible for degradation of 11.37% of total geographical area in Uttarakhand. Of this, 2.7% of the degraded land is part of forests and 8.6% landmass is part of land with scrub.

Endangered Ecosystem: Successive FSI report on India's State of Forest Reports reveals that the very dense forests are gradually declining despite the fact that total forest cover is increasing in the state. Moreover, the latest ISFR report of 2021 observes that the entire forest cover of the state will experience an increase in temperature more than 1.5 degree centigrade and more than 20% rain deficient/excess by 2030.

If the situation persists the report further estimates that by 2085 the nearly 99.6% of the state's forest will experience an increase in temperature by more than 5.1 degree centigrade and more than 38% rainfall departure (FSI, 2024).[80]These climatic changes are sufficient to completely change the ecosystem and local biodiversity.

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[76] Aksheev Thakur, Uttarakhand glaciers melting at larming pace, may trigger water scarcity, The Tribune, Oct 25, 2024: https://www.tribuneindia.com/news/uttarakhand/uttarakhand-glaciers-melting-at-alarming-pace-may-trigger-water-scarcity/

[77] Government of Uttarakhand- Uttarakhand Action Plan on Climate Change, 2014: https://forest.uk.gov.in/uploads/climate_change_information/1616764235.pdf

[78] Indian Institute of Remote Sensing (IIRS), RS for GLOF/LLOF Hazards: https://ndma.gov.in/sites/default/files/PDF/Sikkim_Conclave/Session%205/IIRS%20GLOF_Mapping_Modeling_2022_SDMA.pdf

[79] ISRO, Space Application Centre, Desertification and Land Degradation Atlas of India, 2016: https://www.sac.gov.in/SACSITE/Desertification_Atlas_2016_SAC_ISRO.pdf

[80] FSI, 2023, India Sate of Forest Report, Govt of India, https://fsi.nic.in/isfr-2021/chapter-11.pdf

7 Appendix 2 - Status of social development in Uttarakhand

7.1 Demographics

According to the last census in 2011, Uttarakhand had a population of about 1 crore which has estimated to increase to 1.17 crore in 2024. Male population in the state is considerably high compared to female population making its overall sex ratio high imbalance. According to 2011 census the average sex ratio of the state was 963 females per 1000 males. Sex ratio of children is further skewed and Uttarakhand had one of lowest child sex ratio. According to official data of 2011, the child sex ratio of the state was 890 females per 1000 males.

The population density of the state is highly uneven with very low population density in hilly districts such as Uttarkashi, Chamoli and Pithoragarh. However, the population density in Tarai region and Himalayan foothills such as Haridwar, Udham Singh Nagar, Dehradun and Nainital is relatively high.

More than 62% of the total population of the state is concentrated in four districts namely, Haridwar, Udham Singh Nagar, Nainital and Dehradun. This concentration is further increasing due to high population growth in these four districts and heavy out migration from hilly districts to these districts in search of jobs, better health and education facilities.

Table 26 Uttarakhand Population Data

Description	2011 Census	2024 Estimate
Total Population	10,086,292	11,755,000
Male Population	5,137,773	6,027,000
Female Population	4,948,519	5,728,000
Sex Ratio	963/1000 males	953/1000 males
Child Sex Ratio	890	N/A
Population Density (per sq. km.)	189	213
Total Area (sq. km.)	53,483	53,483
Literacy Rate (%)	78.82	87.60
Male Literacy (%)	87.40	91.81
Female Literacy (%)	70.01	77
Urban Population (%)	30.23	N/A
Rural Population (%)	69.77	N/A

In terms of religions, Hinduism is the dominant faith, practiced by 82.97% of the population. Muslims form the largest minority group at 13.95%, followed by Sikhs (2.34%), Christians (0.37%), Buddhists (0.15%), and Jains (0.09%). The hill regions are predominantly Hindu, while the plains have a more diverse religious composition with significant Muslim and Sikh populations.

Despite its diversity, caste-based discrimination persists in rural areas, particularly affecting Dalits. Untouchability and socio-economic exclusion remain challenges for marginalized groups in the state. Overall, Uttarakhand reflects a complex interplay of caste and religion within its demographic framework.

7.2 Health and Nutrition

Latest National Health and Family Welfare Survey (NFHS-5), 2019-21 reveals that maternal and child health outcomes of the state have not improved much. Children's health and survival is also highly compromised as the NNMR stood at 32.4 and Under five year mortality rate is as high as 45.6.

Table 27 Health Status in Uttarakhand

Health Status	Urban	Rural	Total
Neonatal Mortality Rate (NNMR)	36.2	30.6	32.4
Infant Mortality Rate (IMR)	38.3	39.5	39.1
Under 5 Mortality Rate (U5MR)	46.2	45.3	45.6
% of Mother received minimum 4 ANCs	71.0	57.3	61.8
% of Anaemic Children	63.8	56.6	58.8
% of Anaemic Pregnant Women	51.9	44.3	46.4
Out of Pocket Expenditure per delivery	Rs. 3124	Rs. 3447	Rs. 3343
% of Children under 5 Yr Stunted	24.3	28.2	27.0
% of Children Wasted	17.4	11.3	13.2
% of Children underweight	21.0	20.9	21.0

Source: NFHS, 2019-21

Uttarakhand faces notable healthcare challenges, particularly in rural and hilly areas. As of 2023, the state reports 5.6 Primary Health Centers (PHCs) and 2.2 Community Health Centers (CHCs) per 100,000 people, which is lower than the national average. Healthcare expenditure per capita is ₹6,800, representing approximately 12.3% of household expenditure. Despite improvements in health outcomes, such as a decline in the infant mortality rate (IMR) to 33 per 1,000 live births, disparities remain, particularly in remote districts like Chamoli, where home deliveries are prevalent due to limited healthcare facilities.

Shortfall of health professionals and absence of basic facilities in public health institutions in Uttarakhand further reflected in poor health outcomes of the state. Basic health services such as maternal and child health is high compromised in the state.

The shortage of medical and paramedical staff is clearly reflected in the health outcomes of Uttarakhand. The latest NFHS report reveals that NNMR, MMR and U5MR is as high as 32,39 and 45 respectively. It reveals that as high as 46.4% pregnant women are anaemic and out of total only 39.1% pregnant women receive minimum required four ante natal care (ANC) visits.

The Palayan Aagyog report suggests that nearly nine per cent people are migrating because of poor health facilities in their villages. This proportion is even higher in remote districts such as Chamoli, Pithoragarh and Pauri. Apart from basic healthcare facilities such as maternal and child health, the state is also facing challenges related to increase in cases of non-communicable diseases and life-style diseases. The NFHS-V report suggests an increase in cases of such incidents.

Table 28 Health Facilities in Rural Uttarakhand

Health Facility	2005	2021
Health Sub Centre (HSC)	1576	1823
Primary Health Centre (PHC)	225	246
Community Health Centre (CHC)	44	53

Source: Rural Health Statistics, 2021

According to National Health Standards, Uttarakhand has built rural health institutions such as Sub Centres, PHCs and CHCs. In terms of Sub Centre the state has more centres compared to national health standards. However, it has a marginal shortfall in the number of PHCs and CHCs. However, facilities in these health institutions and required health professionals have been a big challenge in the state. Despite having enough public health institutions nearly 10% of the hilly population in the state are migrate in search of better health facilities.

Table 29 Health Professionals in Rural Uttarakhand

Health Professionals	2005		2021	
	Required	In Position	Required	In Position
ANM/ Health Worker	1801	1486	2068	1816
Doctors at PHCs	225	182	245	301
Specialist at CHCs	176	71	212	52
Pharmacists at PHCs and CHCs	269	281	298	310
Lab Technicians at PHCs and CHCs	269	32	298	93
Nursing Staff at PHCs and CHCs	533	129	616	383

Source: Rural Health Statistics, 2021

There is a huge shortfall of health professionals both medical and Para-medical in rural regions of Uttarakhand making the health institutions ineffective. Latest data of Rural Health Statistics, 2021 reveals that there are only 52 specialist doctors against the required 212 in 52 CHCs of Uttarakhand. Similarly, there is a significant shortfall of Lab Technicians and Nursing staff in PHCs and CHCs.

Moreover, healthcare disparities reflect the uneven distribution of resources. For example, Dehradun has 2.5 healthcare centres per 1,000 population, but Chamoli has only 1 per 2,000 people (Source: Uttarakhand Health Department, 2023). As a result, rural areas experience worse infant mortality rates (IMR) and maternal mortality rates (MMR).

Image Source

The IMR in rural Uttarakhand is reported at 43 per 1,000 live births, compared to 32 per 1,000 live births in urban areas (Source: Ministry of Health and Family Welfare, 2022). Similarly, MMR in rural regions stands at 220 per 100,000 live births, significantly higher than the urban rate of 160 per 100,000 live births (Source: National Family Health Survey, 2020-21).

These healthcare disparities are emblematic of the broader social cohesion issue, as rural residents remain at a distinct disadvantage in accessing basic social services, which impacts their economic mobility and undermines communal solidarity.

7.3 Education

Uttarakhand's literacy rate is 87.6% (2021), with male literacy at 92.1% and female literacy at 82.2%. While there has been progress in expanding educational access, rural areas continue to face challenges related to infrastructure, teacher shortages, and gender disparities. Programs like E-Vidya aim to provide digital learning in remote areas, yet the student-teacher ratio remains concerning, particularly in high-altitude regions. The state government aligns with the National Education Policy 2020 to improve educational infrastructure and gender parity.

In terms of enrolment of children, the state has remarkable statistics. The gross enrolment ratio in higher education is as high as 33, which is more than the national average. However, high enrolment has not meant good educational outcomes. According to ASER Report, 2022, children in Std III, "9% cannot even read letters, 23.9% can read letters but not words or higher, 18.4% can read words but not Std I level text or higher, 21% can read Std I level text but not Std II level text, and 27.7% can read Std II level text. For each grade, the total of these exclusive categories is 100%."

Table 30 Gross Enrolment Ratio in Uttarakhand

Education Level	Total GER
Primary	99.29
Upper Primary	86.89
Elementary	94.58
Secondary	85.72
Senior Secondary	75.83
Universities	33.30

Source: Educational Statistics at A Glance, 2018

% Children by grade and Reading Level

Std	Not even letter	Letter	Word	Std I level text	Std II level text	Total
I	40.7	35.4	14.1	5.1	4.7	100
II	18.8	37.8	18.1	12.5	12.7	100
III	9.0	23.9	18.4	21.0	27.7	100
IV	6.5	15.3	11.7	22.2	44.3	100
V	4.0	10.3	11.3	20.8	53.6	100
VI	3.8	6.9	8.2	15.0	66.2	100
VII	2.5	6.4	4.4	14.6	72.0	100
VIII	2.0	2.5	3.6	9.7	82.2	100

% Children by grade and Arithmetic Level

Std	Not even 1-9	Recognise number		Subtract	Divide	Total
		1-9	11-99			
I	32.6	37.5	25.1	3.5	1.3	100
II	12.6	38.6	39.0	7.8	2.0	100
III	6.3	22.6	47.6	15.5	8.1	100
IV	3.8	16.4	41.5	18.6	19.9	100
V	3.0	11.3	37.5	17.8	30.6	100
VI	3.0	8.9	33.0	21.7	33.3	100
VII	1.9	6.8	34.8	21.8	34.8	100
VIII	1.7	4.3	26.8	22.8	44.4	100

Source: ASER Report, 2022

Furthermore, the report also suggests that "among children in Std III, 6.3% cannot even recognise 1-9, 22.6% can recognise numbers up to 9 but cannot recognise numbers up to 99 or higher, 47.6% can recognise numbers up to 99 but cannot do subtraction, 15.5% can do subtraction but cannot do division, and 8.1% can do division. For each grade, the total of these exclusive categories is 100%."

While the state has a lot of educational institutions at all levels, there exists shortage of human resources. According to the data provided by the Union Ministry of Education in primary and upper primary schools nearly 16.67% positions of teachers are vacant, leading to educational deprivation of children at the elementary level.

Uttarakhand's human development indicators in health and education show progress but require continued investment in rural regions to bridge disparities. These improvements are vital for the state's overall economic growth and development.

Table 32 Educational Institutions in Uttarakhand

Type of Institutions	Number
Primary	15,479
Upper Primary	5,017
Secondary	1,294
Senior Secondary	2,218
Universities	28
Colleges	439
Stand alone Institutions	134
Higher Educational Institutions	601

Source: Educational Statistics at A Glance, 2018

According to statistics of the Union Ministry of Education there are 15,479 primary schools and more than five thousands upper primary schools in Uttarakhand providing elementary education to children.

Table 33 Teachers' Availability in Primary and Upper Primary Schools

Total Sanctioned Teacher's Post	46,053
Total Working Teachers	38,377
% of Shortfall	16.67%

Source: Educational Statistics at A Glance, 2018

Educational Institutions in Uttarakhand are highly concentrated in urban areas and more importantly in Tarai and plain districts. Infrastructural facilities and teaching resources in educational institutions in rural and hilly regions are in bad shape. This disproportionate allocation of educational resources is also reflected in the educational outcomes of the state.

7.3.1 Educational inequality and access

Educational inequality is another significant challenge. Although the net enrolment ratio (NER) in the state is reported at 97.3% for children aged 6-14 years in urban areas, the NER in rural areas is considerably lower at 82.6% (Source: Ministry of Education, 2022). Out-of-school children represent a troubling trend, particularly in remote hill districts like Chamoli, where up to 14% of children are not attending school, largely due to distance, economic constraints, and cultural norms (Source: District Education Plan, Uttarakhand, 2023). The dropout rate for girls in rural areas stands at 18.2%, compared to 9.4% in urban areas, revealing stark contrasts in access to education based on geographical and socio-economic factors.

Furthermore, private school enrolment is on the rise, with 67% of students in the 6-14 age group attending private schools (Source: Uttarakhand Education Survey, 2023). This highlights the increasing reliance on private education, often due to perceived better quality and infrastructure, which further deepens the divide between rural and urban educational opportunities.

7.3.1.1 Higher Education

Higher education in Uttarakhand has expanded significantly, with 26 universities, including the GB Pant University of Agriculture and Technology at Pantnagar and the Veer Chander Singh Garhwali University of Horticulture and Forestry at Amoli Range and the Hemvati Nandan Bahuguna Garhwal University, as Central university, and prestigious national institutions like IIT Roorkee, IIM Kashipur and AIIMS Rishikesh.

However, the quality of education remains a concern. Issues such as inadequate infrastructure, insufficient qualified faculty, and lack of focus on employable skills exacerbate the problem.

Despite a Gross Enrolment Ratio of 45.7% (above the national average) in higher education, unemployment among educated youth is high at 17.4%, reflecting a gap between education and job market demands.

7.4 Institutional Development

7.4.1 Community Action and Social Movements

Uttarakhand has had a long history of community action. Major agitations against the British Raj took place in the state. The Coolie Begar Movement of 1921 was a widespread protest against the system where local residents were compelled to carry the luggage (as coolies) of British officials for free (begar). This movement was successful in having that system abolished.

Later, in the 1930s, there was a forest rights movement starting with the Tilari Satyagraha in 1930 in Tehri Garhwal, where the villagers demanded rights to free wood and fodder, for their subsistence. This resulted in reforms of forest regulations and the unique Van Panchayat system was established where communities had usufructuary rights to forests around their villages. The Quit India Movement of 1942 also saw many local reverberations in Kumaon and Garhwal.

After Independence, Uttarakhand, then a part of Uttar Pradesh, became world-famous for the Chipko (hug the trees) Movement to prevent felling of trees by contractors of the forest department. Led by women, this became the first widespread people's movement against state-sponsored environmental destruction.

Subsequently there was a long-term movement against the Tehri Dam, although it eventually did get constructed. Another unifying agitation was the demand for separate hill state, which went on for two decades and eventually led to the formation of Uttarakhand state in 2000. Though there have been no major agitations since then, the tradition of local social activism continues to be robust in Uttarakhand. However, as the concerns of shift towards employment, income and development, people are pursuing these goals individually rather than organising.

7.4.2 Civil Society Institutions

The lead role in this work of forming and building the capacity of community level institutions will have to be played by civil society institutions or NGOs, and several example of this exist in Uttarakhand, from the earlier generation Gandhian/Sarvodaya/Khadi institutions such as the Laxmi Ashram, Kausani and the Dasholi Gram Swarajya Mandal, Chamoli, to new generation NGOs like CHIRAG and Grassroots in Kumaon and HARC and PSI in Garhwal.

However, as noted by Mukherjee (2003) "The NGO movement is split into different camps and factions. The vast majority have been co-opted to work as 'private service providers' for the several donor funded projects in the region, including the forestry project. Once they have accepted working on project terms, they effectively lose their critical and questioning voice. The overall impact is that today the NGO and civil society movements have been considerably weakened with hardly any concerted public action for protecting people's forest rights." This was written 22 years ago and since then there has been numerous attempts to revive the civil society institutions in the state, with little success. Though CSR funding has replaced much of earlier foreign funds, but this source as well as government schemes, are both over-designed and compliance heavy.

As per the NGO Darpan data, maintained by the Niti Ayog, Uttarakhand has 2,593 registered NGOs. This represents 1.4% of the total registered NGOs in India. NGOs or more broadly, Civil Society Institutions in the state often struggle with mobilizing resources and organizing collaborative efforts. As a result, initiatives aimed at improving local infrastructure, education, and healthcare suffer from a lack of coordination, leading to inefficient development processes and poor social outcomes (Source: Uttarakhand Rural Development Report, 2022).

A recent study by Das et al (2025)[81]shows that CSOs play a significant role through collective action act for adaptive capacity against drought, managing impact of compound disasters such as COVID-19 and cloudburst by building trust in health system and collectivizing for continuing education, and empowering through rights-based dignified livelihood.

The study concluded that collectivization is an innovative way to build resilience. Uttarakhand has a proud tradition of civil society leadership – from Gandhians like Saral Behn, Sundarlal Bahuguna and Chandi Prasad Bhatt to contemporary activists like Dr Shekhar Pathak, Rajiv Lochan Shah, Smt Kamla Pant and Dr Ravi Chopra, and their legacy needs to be kept alive.

7.4.3 Van Panchayats

After a widespread agitation by the people during the British rule, to get access to forests for their fodder and fuelwood needs, the Kumaon Panchayat Forest Rules were enacted under the section 28 (2) of the Indian Forest Act 1927 provides broad guidelines for the supervision and management of forests under the control of Van Panchayats.

The main function of Van panchayats are as follows (Mukherjee, 2003):[82]

a) To develop and protect forests by preventing indiscriminate felling of trees and to fell only those which are marked for by the forest department and are useful from the point of view of silviculture.

b) To ensure that there is no encroachment on Van Panchayati land and that no rules are being violated that are being enacted under Kumaon and Sodic Land Act of 1948 and that no land should be encroached without prior permission for agricultural practices.

c) To construct and fix boundary pillars and to maintain them 18(c).

d) To carry out the directives of the Sub-Divisional Magistrate in developing and protecting forests. 18(a)

e) To distribute its produce amongst right holders in an equitable manner. 18 (e)

f) 20% of the area of the forest must be closed for grazing every year.

[81] Das, Sanchita, et al (2025) in Dasgupta S, et al (Eds) Communication, Science, Technology, and Innovation in Disaster Risk Management: Recent Trends and Approaches in South Asia, 167-179, 2025 https://link.springer.com/book/10.1007/978-3-031-77189-7

[82] Mukerjee, Pampa (2003) Community Forest Management in India: The Van Panchayats of Uttaranchal, FAO. https://www.fao.org/4/XII/0108-C1.htm#

Punitive Powers

a) They can levy fines up to Rs. 50 with the prior approval of the Deputy Commissioner (later revised up to Rs. 500).

b) They can seize intruding cattle and impound them under the cattle trespass act of 1871.

c) They can forfeit the weapons of the offender.

Administrative and financial powers

a) They can sell grass, fallen twigs and stone slates to local people.

b) They can auction trees up to the value of Rs.5000 with the approval of the District Magistrate and Divisional Forest Officer. Auction above Rs. 5000/- is done by the Forest Department.

(c) The income realised from resin, timber and fees is distributed as follows. i) Zilla Parishad is given 20% for creating and maintaining infrastructure ii) Gaon sabha is given 40% for local development schemes if approved by Block development committee iii) the remaining is to be ploughed back by the forest department for maintenance and development of Panchayat rules.

However, a series of amendments in 1972 (revised in 1976), 2001, 2005 and 2012, diluted the powers of Van Panchayats and passed control of the decision-making process into the hands of forest and revenue department officials. The result is that they have been rendered dysfunctional in almost half of the 12,092 Van Panchayats of Uttarakhand. About 6000 active Van Panchayats manage 405,000 hectares of forests. (Lopes, 2022, op. cit.).

7.4.4 Panchayati Raj Institutions (PRIs)

There are 7791 Gram Panchayats, 95 Kshetra (Block level) Panchayats and 13 District Panchayats in Uttarakhand. In addition, there are 112 urban local bodies in Uttarakhand. As per the Government's websites, Gram Sabhas are being held and the people made aware of the various government schemes and funds available. The Gram Panchayat Development Plans are being discussed and uploaded on the e-gramswaraj portal including photographs of meetings.

7.4.4.1 Funds, Functions and Functionaries

Going beyond the glowing reports on the Panchayati Raj department websites, we see there are deficiencies in all the three important aspects - funds, functions and functionaries.

As per the report[83] for the year ended 31 March 2017 by the Comptroller and Auditor General (CAG) of India, in 2016-17, the total revenues of all PRI was only Rs 550 crore, amounting to a little less than Rs 7 lakh per PRI, of which the contribution of their own revenue was a miniscule 6.2%.

The main source of funds for Panchayats was the Central Finance Commission transfers, which was 51% of the total and the State Finance Commission transfers, which was 45% of the total. General grants to Panchayats were supplemented with nearly Rs 892 crore of funds under central schemes such as MGNREGA (Rs 729 crore), Indira Awas Yojana (57 crore), BRGF (33 crore), NRLM (13 crore) and BADP (60 crore).

However, Panchayats had mainly a last mile implementation role in these schemes, with the exception of MGNREGA and most of the decisions on how the money would be spent were taken at levels higher than the local body.

On functions, as per the constitutional provisions (Article 243-G), Panchayats are responsible for preparation of plans and their execution for economic development and social justice with regard to 29 subjects listed in the XIth Schedule of the Constitution.

The Govt of Uttarakhand had decided as far back as October 2003 to transfer only 14 subjects to PRIs in the first phase. As per the CAG Report, "However, as the Government failed to devolve necessary powers and resources to the Panchayats, the transfer of the said 14 subjects remained ineffective."

In terms of functionaries, the CAG report found 43% of the PRI staff posts were vacant.

Thus, there is a need for much more devolution of funds, functions and functionaries to make PRIs more capable of handling local welfare and development functions in the spirit of the 73rd Amendment.

7.4.5 Urban Local Bodies (ULBs)

There are six Nagar Nigams, 43 Nagar Palika Parishads and 43 Nagar Panchayats in the State. We suggest an investment in this sector to strengthen institutions like the Panchayats, Zilla Parishads and Municipalities.

In the case of urban local bodies, the same CAG report indicated that the total resources were Rs 542 crore, of which the ULBs' own revenues contributed 17.8%, the rest coming from Central and State grants.

In terms of functions, ULBs had been developed 11 out 16 functions, but powers for five crucial ones were not devolved - including land use regulation, urban planning, socio-economic planning, water supply and fire services. Many other functions were effectively run by state-controlled entities in the name of Smart City or Infrastructure Projects, which were managed by special purpose vehicles.

As in the case of PRIs, there is a need for much greater devolution of funds, functions and functionaries to make ULBs more capable of handling welfare and development functions in urban areas, in the spirit of the 74th Amendment.

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[83] CAG (2018) Annual Technical Inspection Report on Panchayati Raj Institutions and Urban Local Bodies, 2016-17 https://cag.gov.in/webroot/uploads/download_audit_report/2017/ATIR%202016-17_English-062c68df1a6a024.93837862.pdf

8 Annexure 3 - Status of the Economy

8.1 GSDP overall and by sector

The economy of Uttarakhand is a dynamic mix of agriculture, industry, and services, supported by the state's unique geography, cultural heritage, and natural resources. This section provides an overview of the current economic landscape in Uttarakhand, examining the contribution of key sectors, demographic trends, and geographical features that shape its development trajectory.

Uttarakhand's Gross State Domestic Product (GSDP) for 2024-25 (at current prices) reached approximately Rs 3,94,675 crore, (around $46 billion), showing steady growth with a compound annual growth rate (CAGR) of about 8-9% over the last decade.

Table 34 GSDP of Uttarakhand and All-India GDP at Constant (2011-12) Prices

Year	Uttarakhand		All India	
	GSDP (₹ Crores)	Growth Rate(%)	GDP (₹ Crores)	Growth Rate (%)
(1)	(2)	(3)	(4)	(5)
2011-12	115328	-	8736329	-
2012-13	123710	7.27	9213017	5.5
2013-14	134182	8.47	9801370	6.4
2014-15	141278	5.29	10527674	7.4
2015-16	152699	8.08	11369493	8.0
2016-17	167703	9.83	12308193	8.3
2017-18	181043	7.95	13175160	7.0
2018-19[RE]	191484	5.77	13981426	6.1
2019-20[PE]	199718	4.30	14565951	4.2

RE- Revised Estimates, PE- Provisional Estimates
Source – DES Uttarakhand and MOSPI Website

Uttarakhand economy is diversified across three sectors namely agriculture & allied activities, industry and services. Service sector contribute highest in the economy of state (Rs. 40,000 crore) followed by Industry (Rs. 25,000 Crore) and Agriculture (Rs. 12,000 crore).

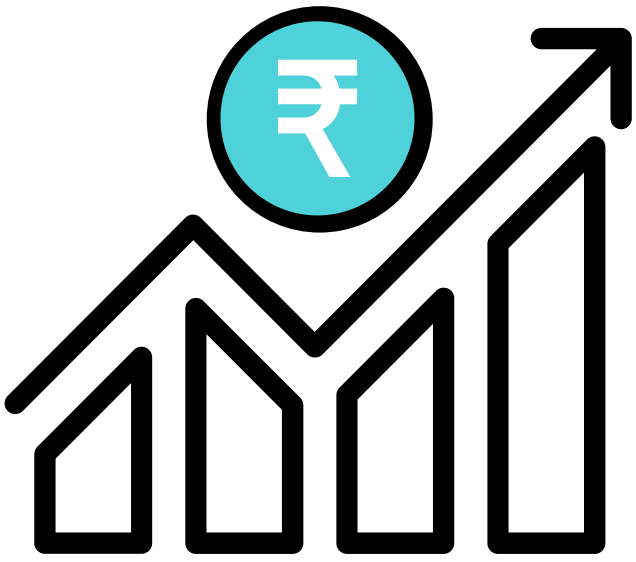


Table 35 Gross State Value Added (GSVA) of Uttarakhand in (₹ Crore)

Sector	2004-05	2022-23	Change	% Change
Agriculture	6,500	12,000	5,500	84.6%
Industry	10,000	25,000	15,000	150%
Manufacturing	5,000	12,000	7,000	140%
Construction	3,000	8,000	5,000	166.7%
Services	15,000	40,000	25,000	166.7%
Banking &Insurance	2,000	6,000	4,000	200%

Source: Handbook of Statistics on Indian States, Reserve Bank of India.

8.1.1 Agriculture and Allied Activities

Agriculture contributes around 10-15% to the GSDP, with crops like rice, wheat, and pulses being predominant. However, due to the state's hilly terrain, there is limited arable land, prompting a shift towards horticulture, floriculture, and organic farming. Due to mountainous terrain, only about 14% of the land is suitable for cultivation, impacting productivity and income stability for small and marginal farmers.

8.1.2 Industry, Construction and Uti

Contributing roughly 30-35% to the GSDP, Uttarakhand's industrial sector includes manufacturing, energy, and construction, with significant industrial hubs in cities like Haridwar and Rudrapur. This sector has benefitted from the establishment of Special Economic Zones (SEZs) and the state's proximity to the National Capital Region (NCR). Despite industrial growth, logistical challenges like inadequate transport infrastructure and power supply fluctuations hinder the sector's potential.

8.1.3 Services including Trade, Transport and Tourism

The services sector is the largest contributor, accounting for nearly 55-60% of the GSDP. Key segments include tourism, education, and healthcare, with Dehradun serving as an educational and administrative hub. Tourism alone is a major economic driver, attracting over 40 million domestic and international tourists annually. However, unemployment remains a challenge, with the state's unemployment rate hovering around 5-6%, reflecting urban-rural disparities in job opportunities. A heavy reliance on tourism and education makes the economy vulnerable to disruptions, as seen during the COVID-19 pandemic.

Tourism remains a cornerstone of the economy, contributing significantly to both direct and indirect employment, particularly in rural areas. The state's cultural heritage and biodiversity, including destinations like Jim Corbett National Park and the Char Dham pilgrimage, draw millions of visitors annually, supporting local businesses and artisans.

8.2 GSDP and Per Capita Income

Uttarakhand's economic performance is illustrated by its Gross State Domestic Product (GSDP) and per capita income, reflecting substantial growth and structural shifts across various sectors. The GSDP of Uttarakhand for 2024-25 (at current prices) is projected to be Rs 3,94,675 crore, amounting to growth of 14% over 2023-24.

The Per Capita Income (PCI) in Uttarakhand was Rs. 2,02,895 in 2019-20, which is substantially higher compared to the national average of Rs. 1,34,226 in the same year. Data of the last decade shows that the PCI has increased in the state from Rs 1,00,314 in 2011-12 to Rs. 2,02,895 in 2019-20. However, the growth rate of PCI has always been slower in the state compared to the national average.

Table 36 Per Capita Income (PCI) of Uttarakhand and All-India at Current Prices

Year	Uttarakhand		All India	
	Per Capita Income (₹)	Growth Rate of PCI (%)	Per Capita Income (₹)	Growth Rate of PCI (%)
(1)	(2)	(3)	(4)	(5)
2011-12	100314	-	63462	-
2012-13	113654	13.30	70983	11.9
2013-14	126356	11.18	79118	11.5
2014-15	136099	7.71	86647	9.5
2015-16	147936	8.70	94797	9.4
2016-17	161752	9.34	103870	9.6
2017-18	180613	11.66	115293	11.0
2018-19[RE]	191450	6.00	126521	9.7
2019-20[PE]	202895	5.98	134226	6.1

RE- Revised Estimates, PE- Provisional Estimates
Source – DES Uttarakhand and MOSPI Website

Similar trends have also been observed by last two National Family Health Surveys (NFHS-4 and NFHS-5). Survey data shows that the multidimensional poverty index (MPI) both for Uttarakhand and all India has decreased. However, the rate of decrease is slower in Uttarakhand as compared to the national average. The MPI of Uttarakhand was 0.058 in 2015-16 which has improved to 0.041 in 2019-21.

Table 37 Multidimensional Poverty Index (MPI)

	Uttarakhand			India		
Survey Source	Headcount Ratio (%)	Intensity (%)	MPI	Headcount Ratio (%)	Intensity (%)	MPI
NFHS-4	15.10	38.50	0.058	24.85	47.14	0.117
NFHS-5	10.20	40.00	0.041	14.96	44.39	0.066

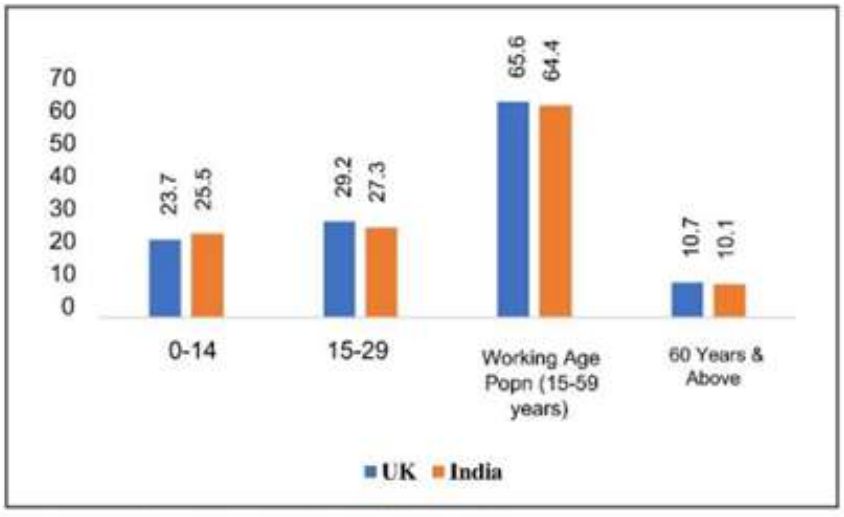
8.3 Household consumption expenditure

As per the Household Consumption Expenditure Survey, 2022-23, Uttarakhand had a per capita monthly consumption expenditure of Rs 4640 in rural areas and Rs 7004 in urban areas, as compared to Rs 3860 for rural India and Rs 6521 for urban India. Of the total consumption of Rs 4640 per capita per month in rural Uttarakhand, the following were the main items: Cereals Rs 201, pulses and pulses Rs 106, sugar Rs 48, salt Rs 5, Milk and milk products Rs 427, vegetable Rs 221, fruits Rs 196, eggs, fish and meat Rs 132, edible oil Rs 137, spices 123, beverages and processed foods Rs 414, pan, tobacco and intoxicants Rs 272, making a total of Rs 2000 for food items. Non-food items included toiletries Rs 130, other household consumables Rs 94, clothing Rs 283, footwear Rs 53, fuel and light Rs 297, conveyance Rs 331, education Rs 200 , medical Rs 266, other consumer services Rs 270, entertainment Rs 54 , rent Rs 27, making a total of Rs 2641.

As can be seen from the above, about 57% of the consumption basket of the state's rural population, which is roughly 90% of the state's population, is of food items. Most of these can be locally produced, with a few exceptions such as spices, tobacco and some beverages. Thus a food self-sufficiency based development strategy makes eminent sense for the state as it will also generate local employment and income.

8.4 Status of livelihoods and employment

The projected population of Uttarakhand in 2021 is about 1.14 million. Out of which the working age population (15-59) accounts for 65.6%. The size of the working age population of Uttarakhand is slightly higher compared to the national average of 64.4%.



Source: National Commission on Population and PLFS, 2019-20

Figure 1 Age Structure of Uttarakhand and All- India, 2021

The high ratio of working age population of Uttarakhand further decreased the dependency ratio in the state. According to data provided by National Commission on Population and PLFS, 2019-20 the dependency ratio of Uttarakhand is 43.3%. Dependency ratio in rural Uttarakhand is relatively high which stand at 45.2%.

8.5 Labour Force Participation Rate (LFPR) and Worker Population Ratio (WPR)

According to the PLFS 2023-24, the Labour Force Participation Rate (LFPR) of all ages for Uttarakhand is 46.2. This figure is slightly less compared to its neighboring Himalayan State, Himachal Pradesh which has LFPR more than 60.

Table 38 Labour Force Participation Rate in Uttarakhand

	Rural			Urban			Rural+Urban		
Age Group	Male	Female	Total	Male	Female	Total	Male	Female	Total
15-29 years	65	23.5	44	60.3	15	38.9	64	21.8	42.9
15-59 years	82.2	55.4	68.4	81	26.3	53.4	81.9	47.7	64.4
15 years and above	76.9	52.6	64.5	75	24.4	49.5	76.4	45.6	60.7
All ages	56.6	41.8	49.3	55.6	18.6	37.2	56.4	35.9	46.2

Labour Force Participation Rate (LFPR) of women in the state is relatively high compared to all India average. The total LFPR for women in rural Uttarakhand is 41.8 however in urban parts the women LFPR is only 18.6. Overall the female LFPR in the state stands at 35.9. The high female LFPR is the state is attributed to higher dependency on agriculture and horticulture in rural areas.

8.5.1 LFPR and WPR – Rural vs Urban

The LFPR and WPR as published by the latest PLFS, 2023-24 there is significant difference in rural and urban areas. In rural areas the LFPR for all ages is 61.9 % against just 46.6% in urban areas. The LFPR in the age group of 15 years and above in rural Uttarakhand is 61.9% and just 46.6% in the urban areas.

The WPR in rural Uttarakhand is also higher compared to urban areas of the state. The WPR in rural areas is 61.9% against just 46.6% in cities of the state. The WPR both in rural and urban Uttarakhand is significantly low compared to neighbouring Himalayan states.

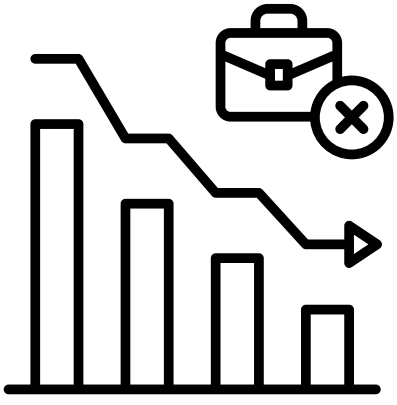
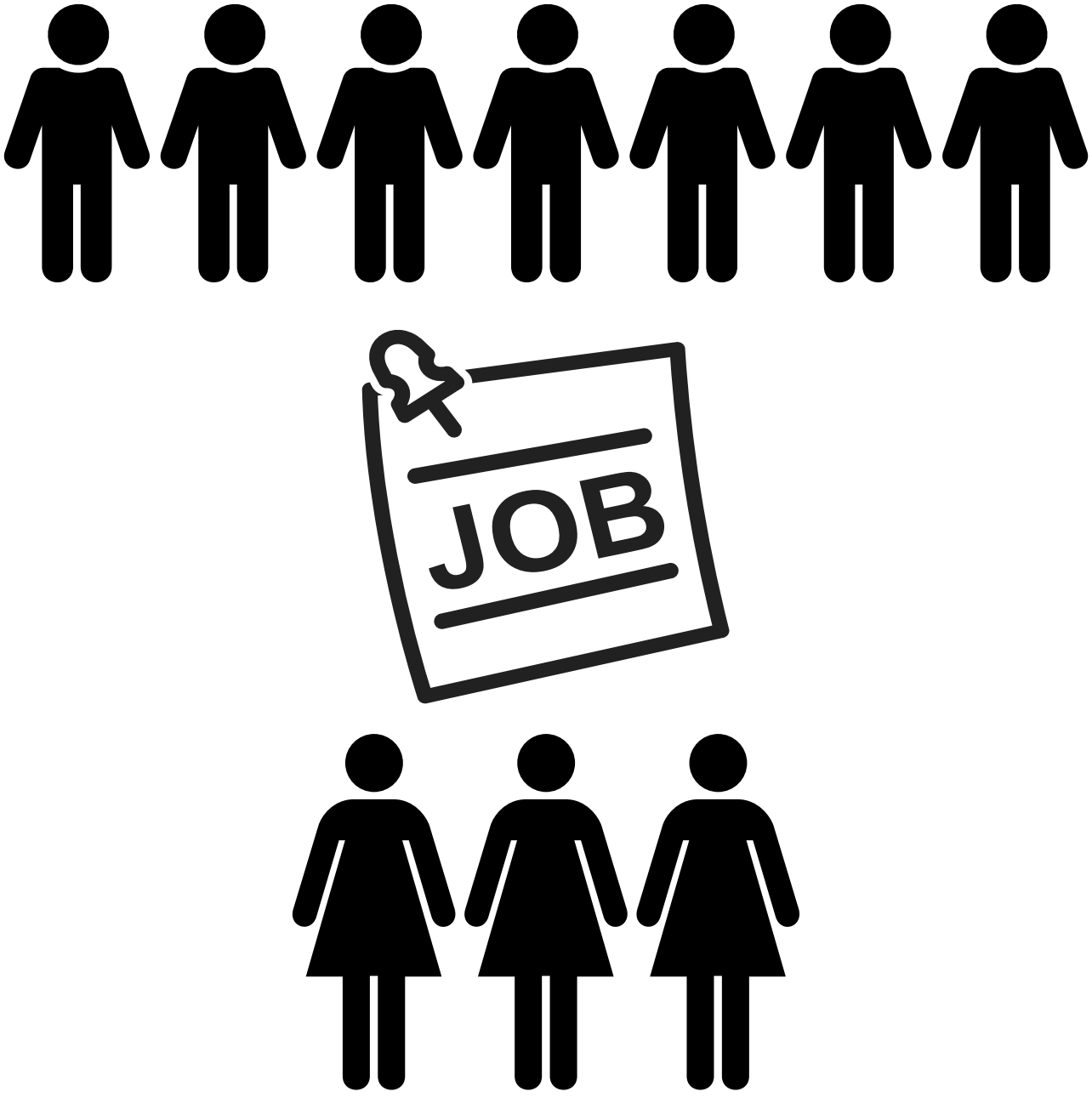


Table 39 Worker Population Ratio (WPR) according to usual status (ps+ss)

Worker Population Ratio (WPR) (in percent) according to usual status (ps+ss) for selected States (age group:15 years and above)						
State/UT	Rural			Urban		
	male	female	person	Male	female	Person
Uttarakhand	73.2	51.2	61.9	72.4	21.2	46.6
All India	78.1	46.5	62.1	72.3	26	49.4

Source: PLFS, 2024

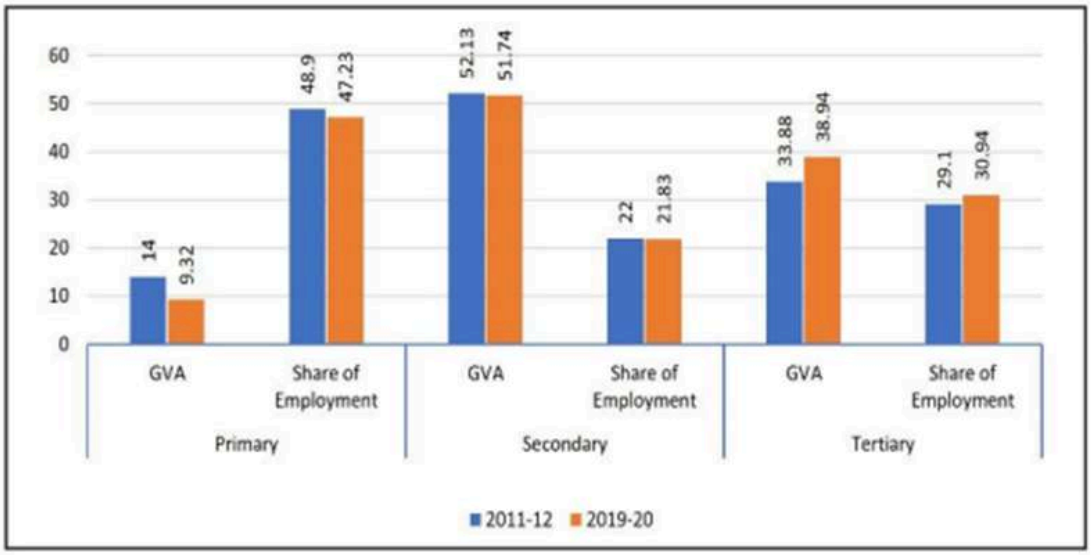
The low rate of LFPR and WPR in Uttarakhand is attributed to deterioration of primary sector specially agriculture and allied sectors. Rural Uttarakhand is less dependent on agriculture, horticulture and livestock. This distinction leads to low female LFPR and WPR in the state.



8.6 Employment versus GSDP by sectors

The employment trends across sectors in Uttarakhand reveal a slower-than-expected transition from agriculture to industrial and service sectors. While there has been modest diversification, the state's economy remains heavily dependent on agriculture, with limited growth in secondary and tertiary sectors.

Primary Sector (Agriculture): The primary sector only contributes 9.32% to the GSDP of Uttarakhand, however this sector employs 47.23% of the total workforce. From 2011-12 to 2019-20 the share of the primary sector has decreased from 14% to 9.32%. Worrying thing is that the share of employment in the primary sector has not reduced in proportion to the reduction in its contribution to the GSDP. The share of employment in the primary sector has marginally decreased from 48.9% in 2011-12 to 47.23% in 2019-20.



Source: GVA- DES, GoUK; Share of Employment- PLFS 2019-20, EUS 2011-12

Figure 4 Employment by Sectors in Uttarakhand

Secondary Sector: Secondary sector that involves industry, manufacturing and construction is the largest sector in the economy of Uttarakhand. This sector contributes nearly 52% to the state GSDP. In the last ten years its contribution remains almost the same in the local economy. Correspondingly, no changes observed in its share in providing employment. The secondary sector provides 21.83% share of employment.

Tertiary Sector: The tertiary sector involves sectors like banking, finance, tourism etc. This sector has grown substantially in the last one decade. The GVA of the tertiary sector has grown from 33.88% in 2011-12 to 38.94% in 2019-20. However, this sector has not created enough jobs in relation to its growth. The share of employment it has is 30.94%, which has marginally increased from 29.1% in 2011-12.

High level of dependency on agriculture and allied sectors for employment is attributed to the limited employment alternatives in urban areas, where industrial and service sector jobs have not expanded as expected.

The Uttarakhand Economic Survey 2023[84] highlights the state's continued reliance on agriculture, despite challenges such as low mechanization and fragmented land holdings. Government initiatives, like the Uttarakhand Organic Farming Policy (2022), aim to revitalize the sector, but these jobs remain predominantly low-skilled.

One of the key factors contributing to the decline in tertiary sector employment is the underdevelopment of urban infrastructure and the challenges of scaling up tourism and hospitality services. Uttarakhand, traditionally a major tourism hub, has struggled to fully tap into the potential of its tourism industry due to infrastructure bottlenecks, inconsistent service quality, and environmental challenges. While the government has launched several initiatives, such as the Uttarakhand Tourism Development Board's (UTDB) Vision 2025 and Mission Tourism, aimed at improving infrastructure and promoting sustainable tourism, these efforts have not yet translated into large-scale job creation in the tertiary sector.

Additionally, the government has been focusing on creating an enabling environment for skill development through schemes like the **P**radhan Mantri Kaushal Vikas Yojana (PMKVY), which aims to train youth for employment in various sectors. However, the challenge remains in translating these skills into long-term jobs, particularly in the services and manufacturing sectors. The Uttarakhand Skill Development Mission has also been instrumental in bridging this gap by enhancing employability, but more targeted interventions are needed to revitalize the tertiary sector.

Furthermore, the state's focus on agro-based industries and horticulture, as seen in schemes like National Mission on Sustainable Agriculture (NMSA), has provided some relief to the primary sector, absorbing labor from the shrinking industrial and service sectors. While these policies have helped keep a significant portion of the population engaged in agriculture, they have not fully compensated for the lack of growth in other sectors.

While the decline in tertiary sector employment is a concern, it reflects deeper issues of economic structure, sectoral challenges, and a lack of adequate policy-driven solutions. The government's initiatives in tourism and skill development have yet to yield the desired job creation effects, and a more focused, integrated approach is needed to address the shifting dynamics of employment across sectors.

[84] Government of Uttarakhand, 2024, 'Economic Survey of Uttarakhand 2023-24', Government of Uttarakhand. https://des.uk.gov.in/dpages/economic-survey

8.7 Status of employment

The category of self employment accounts is the largest employment provider in the state - 57.4% men and 83.1% women. Furthermore, a substantial number of women workers are engaged as unpaid helpers in household enterprises in Uttarakhand - as high as 55.5% of the 83.1% women who are self-employed. Only 14.6% women are regular salary earners in Uttarakhand as against 28.7% males. The residual was casual labour - 13.9% of men and only 2.3% of women. Greater share of its working population in Uttarakhand is engaged in self employment which is largely embedded in agriculture and horticulture.

8.7.1 Self-Employment by Major Industry/Sectors in Uttarakhand

Uttarakhand's labour market showcases a diverse economic structure characterized by significant contributions from agriculture, manufacturing, and services, particularly tourism. Below is a comprehensive overview of employment by major industry sectors in Uttarakhand, incorporating recent data points and insights, including the number of people employed in each sector.

Table 40 Total Self-Employed by Sector till 2022-23

Sector	Men	Women
Agriculture, Forestry, and Fishing	1,200,000	1,050,000
Manufacturing	80,000	45,000
Construction	50,000	10,000
Services (Retail, Hospitality)	150,000	50,000

Uttarakhand's labour market is diversified, with key contributions from agriculture, manufacturing, and services sectors. Employment in these sectors reflects not only the state's economic composition but also its workforce dynamics and the opportunities available for its residents.

8.8 Wage and income levels

Uttarakhand's labour market exhibits a complex structure with significant variations in employment types and income levels, reflecting both opportunities and challenges. The percentage of individuals engaged in regular wage or salaried employment is relatively low, especially when compared to self-employment, particularly among women. In the 2022-23 period, approximately 9.8% of women in Uttarakhand were reported to be in wage employment, with a noticeable disparity between urban and rural areas.

Urban centres, particularly in regions like Dehradun and Nainital, show a higher concentration of women in formal employment, although it remains lower than other metropolitan areas like Delhi, which reports a staggering 96.8% of women in regular wage employment.

Table 41 Average gross earnings during last 30 days (Apr-Jun 2024)

State / UT	regular wage/ salaried employment			casual labour work other than public works in CWS			self-employment		
	rural+urban			rural+urban			rural+urban		
	male	female	person	male	Female	person	Male	female	person
Uttarakhand	24808	17720	23452	449	423	444	15,294	7,239	12,764
all India	21478	15790	20095	459	306	433	16,723	5,803	13,900

Source: PLFS Report 2023-24

The Periodic Labour Force Survey, 2023-24 reveals high disparity in wages and earnings across employment sectors. Data shows that regular wage earner/ salaried employment is highest paying occupation in the state.

People involved in this sectors earns Rs. 23,452 per month. Within this category, women are substantially low paid earning Rs. 17,720 against Rs. 24,808 average earning of men.

Self-employment is also highly gender bias as men earns more than two time of average earning of self-employment women in Uttarakhand. The average earning in the self-employment sector is Rs. 17,764.

Comparing earnings of workers in Uttarakhand with other neighbouring states, the PLFS data reveals that earnings of regular wage earner / salaried people is lowest amongst other state and UTs in western Indian Himalaya. Moreover, earnings of casual labourer in Uttarakhand are lowest in the region.

8.9 Unemployment situation

8.9.1 Unemployment Rates

Uttarakhand has experienced varying unemployment rates over the past decade, reflecting both economic challenges and demographic shifts. According to the latest PLFS data (2021-22), the state's overall unemployment rate stood at 6.3%, slightly below the national average of 6.6%. However, a closer look reveals that urban unemployment is notably higher than rural, reaching 9.2% in urban areas compared to 4.8% in rural regions, highlighting the disparity in job opportunities between rural and urban populations.

Gender disparities are evident in Uttarakhand's unemployment landscape. The unemployment rate for women has consistently been higher than that for men. In 2021-22, female unemployment was at 10.6%, while male unemployment was around 5.1%. Youth (ages 15-29) face the highest unemployment rates, particularly in urban areas where it exceeds 18%. This trend is concerning, as it indicates a potential mismatch between young people's skills and available jobs.

As per the Periodic Labour Force Survey (PLFS) data, unemployment decreased from 7.8% in 2021-22 to 4.5% in 2022-23 but remains higher than the national average of 3.2%. Urban unemployment is higher at 9.2%, compared to rural areas at 4.8%. Gender disparities persist, with female unemployment consistently higher than male unemployment. However, PLFS tends to underplay unemployment as it is based on those who are in the labour force (willing and able to work) but are not in the workforce (employed) . But as we stated above the LFPR is only 46.2% and for women as low as 18.6%.

8.9.2 Not in Education, Employment, or Training (NEET)

So we look at an alternative measure - persons between the ages 15 and 29 years who were not in education, employment, or training (NEET). As per the CAMS- Comprehensive Annual Modular Survey by the NSSO (2002-23)[85], the percentage of persons between the ages 15 and 29 years who were not in employment, education or training (NEET) was 11.1% for rural men, 50.6% for rural women, making up an overall 29.6% for rural Uttarakhand.

In urban areas 5.5% of the males, 46.2% of the females, making up an overall 24.0% of persons between the ages 15 and 29 years. Combined for rural and urban Uttarakhand, 9.7% males (one in 10) and 49.5% females (1 in 2) making up an overall 28.2% of persons between the ages 15 and 29 years were not in employment, education or training (NEET).

The fact that in terms of enrolment in secondary and college education, girls are ahead of boys whereas in the entry into employment, only 50% of educated young women get work, while about 90% males do get work, shows the extent of gender disparity in employment and its consequences on women's empowerment.

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[85] Comprehensive Annual Modular Survey (CAMS)# of the NSSO 2002-23 CAMS Report_October_N.pdf

8.9.3 Unemployment of the Educated

In Uttarakhand, higher education does not necessarily correlate with lower unemployment rates. In fact, college graduates face higher unemployment, exceeding 8% as per PLFS 2021-22. This disparity stems from a skills mismatch, where graduates' qualifications do not align with the available jobs, especially in rural areas where employment is largely informal. Additionally, the state's economic structure, centered around agriculture and tourism, lacks sufficient formal sector opportunities for educated youth. Many graduates also face challenges due to limited vocational training and industry connections, which impedes their readiness for the job market.

Social categories, such as caste and community, also show noticeable trends in unemployment. Scheduled Tribes (STs) and Scheduled Castes (SCs) experience higher unemployment rates than the general population. While SCs have an unemployment rate of 7.5%, OBCs and the general category stand at around 5.3% and 5.0%, respectively. Additionally, religious minorities, especially Muslims, face elevated unemployment levels at approximately 7.8%, indicating social and economic challenges unique to these groups.

8.9.4 Unemployment by Regions /Districts

Unemployment rates in Uttarakhand vary significantly across districts due to differences in industrialization, tourism, and agricultural reliance. Generally, urbanized districts, such as Dehradun and Haridwar, face higher unemployment compared to rural areas, although they attract job-seekers due to better infrastructure and job opportunities. However, reliance on tourism makes these districts vulnerable to economic disruptions. Here's a breakdown for select districts, based on the latest data available:

Table 42 Unemployment Rates by District

District	Urban Unemployment (%)	Rural Unemployment (%)	Total Unemployment (%)
Dehradun	8.5	4.3	6.4
Haridwar	9.0	5.1	7.2
Nainital	7.6	5.4	6.5
Almora	4.5	3.8	4.1
Pithoragarh	5.2	4.6	4.8

Dehradun and Haridwar, known for better employment prospects, exhibit higher unemployment rates. Rapid migration to these areas has strained job availability, especially in service and casual labor roles.

Districts like Nainital face economic vulnerabilities due to their reliance on tourism. Seasonal tourism contributes to fluctuating unemployment, with higher rates during off-peak months. Districts such as Almora and Pithoragarh show relatively low unemployment due to a high engagement in agriculture.

However, low agricultural productivity leads to underemployment, a significant concern in rural areas. Hill districts face unique challenges due to limited infrastructure, making access to formal jobs difficult. Consequently, many youth migrate to urban centers, affecting the workforce availability in rural districts.

Data from the past decade shows a gradual decline in overall unemployment rates, influenced by various government initiatives like MNREGA, which have significantly contributed to rural employment. However, while the average rate has decreased, pockets of high unemployment persist, indicating that further focused interventions are required to address these issues effectively.

The below table provides a district-wise breakdown of unemployment data for Uttarakhand, detailing the number of registrations for employment, the number of government and private job placements, total job placements, and the live register count, which indicates the number of individuals still registered for job placement services with employment offices. The data highlights both public and private sector job placement trends and reveals significant regional disparities across the state in terms of employment opportunities.

Table 43 Registrations for Employment and Placement

District	Registrations	Govt. Jobs Placement	Private Jobs Placements	Total Jobs Placements	Live Register
Dehradun	25,870	1,150	3,200	4,350	21,520
Haridwar	19,430	890	2,150	3,040	16,390
Nainital	13,670	670	1,500	2,170	11,500
Udham Singh Nagar	17,940	780	2,700	3,480	14,460
Pauri Garhwal	11,800	450	950	1,400	10,400
Tehri Garhwal	10,200	400	850	1,250	8,950
Chamoli	7,950	320	600	920	7,030
Pithoragarh	8,500	360	720	1,080	7,420
Almora	9,100	390	800	1,190	7,910
Bageshwar	4,700	190	390	580	4,120
Champawat	5,320	220	450	670	4,650
Uttarkashi	6,300	250	540	790	5,510
Rudraprayag	5,100	210	400	610	4,490

Major urban centres such as Dehradun, Haridwar, and Nainital have higher numbers of both registrations and job placements, indicating that urban areas provide more employment opportunities, especially in private sectors. Rural districts like Chamoli, Bageshwar, and Rudraprayag show significantly lower job placements, reflecting a concentration of employment opportunities in urban regions.

While private sector placements outnumber government jobs, the overall percentage of placements remains low relative to registrations. This reflects a larger trend of dependency on government job opportunities in Uttarakhand, with limited private sector engagement in many regions.

The low numbers of total placements across the state highlight challenges in diverse job opportunities. The Uttarakhand government has initiated various efforts to boost private sector jobs in tourism, hospitality, and other areas, but the uptake remains limited in rural districts where such industries are sparse.

A significant issue highlighted by the data is the skill mismatch, particularly in rural regions where available jobs may not align with the skillsets of registered candidates. This has contributed to higher "live register" counts, meaning many registered individuals remain unemployed despite job availability.

8.9.5 Gender inequality and economic disparities

Gender inequality is another critical challenge. As of 2021, the female literacy rate in Uttarakhand stands at 82.2%, while the male literacy rate is 91.4% (NFHS-5, 2020-21). This 9.2% gap is notably larger in rural areas, where traditional gender norms and limited access to educational facilities prevent women from achieving their full potential. Furthermore, female labour force participation (FLFP) remains low at just 23.7%, compared to 71.2% for men (PLFS, 2022).

Economic disparities are also striking across districts. In Tehri Garhwal, 29.4% of households live below the poverty line, compared to 14.6% in urban areas (Uttarakhand Planning Commission, 2023). In terms of employment, 60% of rural households depend on agriculture as their primary source of income, compared to 35% in urban areas (Uttarakhand Economic Survey, 2023). These figures underscore the importance of addressing gender-based economic exclusion and improving access to non-agricultural livelihoods in rural areas.

8.9.6 Economic inequality and poverty

Uttarakhand's socio-economic development is shaped by deep-rooted disparities in gender equity, educational access, economic inequality, and institutional capacity. These challenges hamper social cohesion, reduce effective collaboration, and hinder the state's broader development agenda.

Uttarakhand shows significant regional disparities, particularly between urban and rural areas. In urban districts like Dehradun and Haridwar, the average household income is approximately ₹2.5 lakh per year, whereas in rural districts like Chamoli and Tehri Garhwal, the average income is ₹1 lakh per year. These gaps are largely driven by access to better economic opportunities and infrastructure in urban centres (Uttarakhand Economic Survey, 2023).

The socio-economic divide between urban and rural Uttarakhand is reflected not only in income but also in employment opportunities. In rural areas, subsistence agriculture dominates, with over 60% of households relying on agriculture as their primary livelihood (Uttarakhand Economic Survey, 2023). However, agricultural yields are often low due to challenging terrain and outdated farming methods. This results in economic vulnerability, particularly in districts like Chamoli, where poverty rates are higher and opportunities for skilled employment are limited.

On the other hand, urban areas benefit from industrialization, with sectors like services, manufacturing, and trade providing diversified sources of income. Dehradun and Haridwar enjoy relatively higher standards of living, with better infrastructure and access to jobs in industry and services, contrasting sharply with the opportunities available in rural areas.

Image Source

8.10 Status of the governance and fiscal health of the state

There have been several attempts made to measure the quality of governance of various states in India. One of the most authoritative studies was by Sudipto Mundle et al (2016). They had developed a Governance Performance Index (GPI) based on the following parameters.

Table 1: List of Indicators

Services	Infrastructure	Social Services	Fiscal Performance	Justice, Law & Order	Quality of legislature
Indicators	Road.	Health	Development Expenditure ÷ Total Expenditure (%)	Proportion of trials completed in less than 3 years (%)	Proportion of MLA's with serious criminal charges pending (%)
	Standard State Highway (in kms.) per 100 sq. km. of Area.	1. Infant Mortality Rate 2. Maternal Mortality Rate 3. Life Expectancy at Birth			
	Power	Education	Own Tax Revenue ÷ GSDP (%)	Rate of Violent Crimes (number per lakh population)	Proportion of women MLA's(%)
	Per capita consumption of electricity (kWh)	1. Literacy rate 2. Gross Enrolment Rate 3. Average Years of Schooling			

Source: Mundle S, et al (2016)[86]

They had also developed a Development Adjusted Governance Inde (DAGI), which took into account the GSDP per capita to compare across states – based on the observation that generally GSDP per capita and governance performance tend to improve in a correlated manner. Thus, if a state is at a lower level of GSDP per capita, its GPI should be adjusted upward to make it comparable with another state with higher per capita GSDP.

Based on their calculation, for 2001 and 2011, Uttarakhand stood at the 17th and the 8th ranks respectively among 19 states which were ranked. Adjusting for GSDP per capita, the DAGI for Uttarakhand put it at the 17th rank in 2011, much lower than the 8th rank in that year for raw GPI. This indicates the overall performance of governance institutions in the state was below par. Unfortunately, we could not find any more recent ratings for GPI or DAGI for Uttarakhand.

The RBI released a study (Rawat, et al 2024)[87] on one major component of governance - fiscal health. The period of the analysis was FY 2022-23. The study identified five major sub-indices to calculate the composite fiscal health index (FHI).

The five major indicators cover fiscal prudence in terms of the level of Deficit, Revenue Mobilization, Quality of Expenditure, Debt Index, and Debt Sustainability. For the period 2015-16 to 2023-24 Uttarakhand scored at the bottom with an FHI score of 36 rank of 11 among all the Himalayan States/UTs.

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[86] Mundle S. et al (2015) National Institute of Public Finance and Policy New Delhi Working Paper no 164, https://sudiptomundle.in/wp-content/uploads/2023/11/Governance-Performance-of-Indian-States-2001-02-and-2011-12-coauthor-NIPFP-working-paper-No.-164-March-2016.pdf

[87] Rawat PS et al (2024) RBI Bulletin June 2024. Fiscal Performance of Himalayan States/Union Territories

As per an analysis by PRS India[88], for Uttarakhand, the revenue surplus in 2024-25 was estimated to be 1.2% of GSDP (Rs 4,737 crore as compared to the GSDP estimated to be Rs 3,94,675 crore). However, the fiscal deficit for 2024-25 is targeted at 2.4% of GSDP (Rs 9,416 crore). Total expenditure (excluding debt repayments) in 2024-25 is targeted at Rs 70,094 crore. In addition, debt of Rs 19,137 crore will be repaid by the state. At the end of 2024-25, the outstanding liabilities are estimated to be 24.2% of GSDP, which is high.

The expenditure is proposed to be met through receipts of Rs 60,677 crore and additional net borrowings of Rs 27,920 crore, leaving an uncovered gap of Rs 634 crore. Of the receipts of Rs 60,677 crore, Rs 27,383 crore (45%) will be raised by the state through its own resources, and Rs 33,170 crore (55%) will come from the centre, of which 23% is share of taxes and 32% is grants.

8.11 Status of Banking, Financial Services and Insurance

8.11.1 Banking access and deposits are pletiful

In terms of banking infrastructure, Uttarakhand as on 31st Mar 2021, had a total of 2401 bank branches, of which 1148 or 48% were in rural areas. Coupled with many "bank mitras" - small outlets away from bank branches, makes it easy to deposit and withdraw, make or receive remittances and payments.

In addition, with the spread of mobile phone-based internet banking, transacting is not a constraint. As a result, as per the NSSO CAMS Report for 2022-23, as many as 94.4% of all persons in Uttarakhand had bank accounts, with the rural percentage of 94.5% slightly higher than 93.8 % for urban dwellers.

The people of Uttarakhand have made good use of this access to banking by keeping their financial savings in the banks as deposits. As per the RBI, the per capita deposit in Uttarakhand was Rs 1.24 lakh in Mar 2022. This should be compared to the Rs 3.94 lakh for Delhi. So neither savings nor bank accounts are a problem. The constraint is the availability of credit.

8.11.2 Credit is inadequate

As on 31st Mar 2021, the total bank deposits in Uttarakhand were Rs 159,856 crore whereas the total loan advances outstanding were Rs 85,143 crore, yielding a credit-deposit (CD) ratio of 55%. Since banks must keep about 25% of their deposits in cash and statutory liquidity reserves, the CD ratio can be 75% (actually, all India CD ratio is 79%).

The gap of 20% amounts to nearly Rs 24,000 crore - this is the amount of deposits of people from Uttarakhand which could have been made available as credit in the state but has been leant elsewhere. This is roughly 42% the amount of bank credit investment we are recommending over the next five years to bring about inclusive and sustainable growth in the state.

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[88] PRS India https://prsindia.org/budgets/states/uttarakhand-budget-analysis-2024-25

Not only is the deprivation of credit by amount, but it is also by the proportion of persons availing credit. As per CAMS 2022-23, while for all India, 18322 persons were borrowers per 100,000 population of persons above 18 years. for Uttarakhand that number was merely 9447. In other words, the proportion of persons availing credit was about 50% of all India level, and incidentally only 16% of the state with the highest proportion of borrowing adults – Andhra Pradesh. Though it can be said that the ethic of "spending within one's own means" is a cautious ethic, that is true for consumption credit. The lack of credit for productive purposes – in agriculture or non-farm business activity, can be a serious constraint on output and can reduce potential growth of incomes and employment.

The ratio of bank credit outstanding at the end of the year to the GSDP of the state for the year is a measure of credit adequacy. For Uttarakhand it was only about 15% in 2022-23, as against 90.1% for all India. This is another way of seeing how the state economy is not capitalised enough. This then naturally has implications for lower than potential growth of incomes and employment.

We can also see the sectoral variation in availability of credit. The state level credit plan for 2024-25 all the banks together was to disburse Rs 57,624 crore, of which 79.9% (as against RBI target of 40%) was in the priority sector. Of the Rs 46,056 crore credit to be disbursed in the priority sector.

Out of the total priority sector credit potential, farm credit comprises of Rs. 19,223 crores (41.7%) and MSME Rs. 22,404 crores (48.6%). Thus, the credit profile reflected the underlying economy of the state. (SLBC, 2025)

According to the State Focus Paper for Uttarakhand for the year 2025-26 prepared by NABARD, a credit potential of Rs ₹54,698 crore has been estimated. which is 18.8% higher than the current year ACP (Annual Credit Plan) priority sector target of Rs 46,056 crore. The plan details the projected credit needs for different sectors, such as agriculture (crop production, farm credit, and infrastructure) and MSMEs (investment and working capital).[89]

[89] State Credit Plan 2025. State Level Bankers' Committee (Uttarakhand)|Convenor: STATE BANK OF INDIA

8.11.3 Investments

The awareness of investment avenues, such as in mutual funds or equities is still quite low in the state. As per the Association of Mutual Funds of India (AMFI), the total assets under management (AUM) from Uttarakhand was Rs 30,500 crore at the end of 2024, with 88% invested in equity funds. (AMFI, 2025)[90] Per capita AUM was only Rs 26,580. For comparison, we note that the total AUM for Delhi was Rs 559,800 crore and per capita AUM was Rs 272,440.

8.11.4 Insurance

Likewise, the use of insurance for risk coverage was limited in Uttarakhand. As per the General Insurance Council data, the Insurance density which is defined as the Gross Direct Premium Income (GDPI) per capita in the state was just Rs 1558 in 2021, as compared to Rs 7912 in Delhi. (GIC, 2025)[91] In summary, the status of the BFSI sector in Uttarakhand is still at an early stage. As the state moves to the next stage of development, this sector will have to be encouraged to grow.

[90] Association of Mutual Funds of India (2025) https://www.amfiindia.com/geographical-spreads1

[91] General Insurance Council of India (2025) https://www.gicouncil.in/yearbook/2021-22/indian-non-life-insurance-industry-analysis/section-02-statewise-penetration-density/statewise-penetration-density/?stateName=10

A NEW Strategy for Inclusive and Sustainable Development of Uttarakhand Based on An Analysis of the Current Status of the Environment, Society and Economy of Uttarakhand

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