

# District Climate Action Plan

Kushinagar

Uttar Pradesh, India

**51**

RESILIENCE SCORE

**Developing**

RATING BAND

**7**

DIMENSIONS



Scan for live profile

Generated: 15 July 2026  
75 Indicators · 9 Sectors · 29  
Actions  
IPCC AR6 WGII Aligned  
District Code: 535

# About This Report

## WHAT THIS REPORT IS

A data-driven, district-specific climate resilience assessment and action plan generated from 75 indicators across 7 dimensions. It provides evidence-based adaptation recommendations mapped to government schemes, with phased implementation timelines and budget estimates.

## WHO THIS REPORT IS FOR

District Collectors, Chief Development Officers, Block Development Officers, District Disaster Management Authority, State Climate Change Cells, NITI Aayog, development agencies, CSR teams, and elected representatives of Kushinagar, Uttar Pradesh.

## HOW TO USE THIS REPORT

This report follows a **Situation → Analysis → Strategy → Action** framework. Begin with the Executive Summary (Chapter 2) for key findings. Review the Climate Profile (Chapter 3) and Vulnerability Assessment (Chapter 4) for evidence. Use the Sector Action Plans (Chapters 5-13) as the basis for departmental work plans. The Implementation Roadmap (Chapter 14) and Budget Summary (Chapter 15) provide the operational blueprint.

## TABLE OF CONTENTS

|               |                                            |     |
|---------------|--------------------------------------------|-----|
| Chapter 1     | Disclaimer, Data Sources & Methodology     | 3   |
| Chapter 2     | Executive Summary                          | 8   |
| Chapter 3     | Climate Profile & Projections              | 14  |
| Chapter 4     | Vulnerability Assessment                   | 27  |
| Chapters 5-13 | Sector Action Plans (9 sectors)            | 42  |
| Chapter 14    | Implementation Roadmap                     | 75  |
| Chapter 15    | Budget & Financing Strategy                | 82  |
| Chapter 16    | Monitoring & Evaluation Framework          | 88  |
| Chapter 17    | Institutional Framework                    | 94  |
| Annexures A-H | Data Tables, Schemes, Glossary, References | 100 |

## 1. Disclaimer, Data Sources & Methodology

**Important Disclaimer:** This Climate Action Plan for Kushinagar, Uttar Pradesh is generated using modelled estimates derived from publicly available datasets. It is intended solely as a **decision-support tool** and **must** be validated against local ground-truth data, stakeholder consultation, and departmental assessments before any policy implementation or budgetary commitment. This document does **not** constitute an official government assessment, audit, or legal opinion. It is a data-driven analytical product for planning support only. The scores, projections, and recommendations presented herein reflect the best available data at the time of generation and are subject to the limitations described in Section 1.3. Resilient Sustainance Private Limited accepts no liability for decisions made solely on the basis of this report without independent verification.

### 1.1 Data Source Acknowledgements

This Climate Action Plan for Kushinagar draws on 15 primary data sources spanning climate science, socioeconomic indicators, infrastructure assessments, and governance metrics. The table below provides the complete data source inventory with responsible agencies, specific datasets utilised, temporal coverage, and access URLs.

| SOURCE                    | AGENCY                                    | DATA USED                                               | YEAR         | URL                                                                                                                                                   |
|---------------------------|-------------------------------------------|---------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Census of India           | Office of the Registrar General           | Population, demographics, literacy, urbanisation        | 2011         | <a href="https://censusindia.gov.in">https://censusindia.gov.in</a>                                                                                   |
| NASA POWER                | NASA Langley Research Center              | Temperature, precipitation, solar radiation             | 2000-2024    | <a href="https://power.larc.nasa.gov">https://power.larc.nasa.gov</a>                                                                                 |
| MODIS (MOD13Q1)           | NASA / USGS                               | NDVI vegetation index, land use change                  | 2024         | <a href="https://lpdaac.usgs.gov">https://lpdaac.usgs.gov</a>                                                                                         |
| IMD Gridded Rainfall      | India Meteorological Department           | Monsoon patterns, extreme rainfall events               | 1951-2024    | <a href="https://imd pune.gov.in">https://imd pune.gov.in</a>                                                                                         |
| CMIP6 Projections         | WCRP / ESGF                               | Climate scenarios (SSP1-2.6, SSP2-4.5, SSP5-8.5)        | 2030-2100    | <a href="https://esgf-node.llnl.gov">https://esgf-node.llnl.gov</a>                                                                                   |
| NITI Aayog SDG India      | NITI Aayog                                | SDG baseline scores, development indicators             | 2023-24      | <a href="https://sdgindiaindex.niti.gov.in">https://sdgindiaindex.niti.gov.in</a>                                                                     |
| BIS Seismic Zoning        | Bureau of Indian Standards                | Seismic hazard classification                           | IS 1893:2016 | <a href="https://bis.gov.in">https://bis.gov.in</a>                                                                                                   |
| IPCC AR6 WG II            | Intergovernmental Panel on Climate Change | Vulnerability framework, adaptation pathways            | 2022         | <a href="https://www.ipcc.ch/report/ar6/wg2/">https://www.ipcc.ch/report/ar6/wg2/</a>                                                                 |
| NDMA Guidelines           | National Disaster Management Authority    | Hazard profiles, early warning systems                  | 2019         | <a href="https://ndma.gov.in">https://ndma.gov.in</a>                                                                                                 |
| CGWB                      | Central Ground Water Board                | Groundwater levels, aquifer mapping                     | 2023         | <a href="https://cgwb.gov.in">https://cgwb.gov.in</a>                                                                                                 |
| ERA5 Reanalysis           | ECMWF / Copernicus CDS                    | Surface temperature, wind, humidity, evapotranspiration | 1950-2024    | <a href="https://cds.climate.copernicus.eu">https://cds.climate.copernicus.eu</a>                                                                     |
| NOAA IBTrACS v4           | NOAA NCEI                                 | Tropical cyclone tracks (global best-track archive)     | 1842-2024    | <a href="https://www.ncei.noaa.gov/products/international-best-track-archive">https://www.ncei.noaa.gov/products/international-best-track-archive</a> |
| AVISO Satellite Altimetry | CNES / EUMETSAT                           | Sea level rise rates along Indian coast                 | 1993-2023    | <a href="https://www.aviso.altimetry.fr">https://www.aviso.altimetry.fr</a>                                                                           |
| GSI Landslide Atlas       | Geological Survey of India                | Landslide susceptibility maps, historical events        | 2020         | <a href="https://www.gsi.gov.in">https://www.gsi.gov.in</a>                                                                                           |
| India WRIS                | Central Water Commission                  | River basin hydrology, flood histories, dam data        | 2024         | <a href="https://indiawris.gov.in">https://indiawris.gov.in</a>                                                                                       |

All data sources are publicly available and are accessed through official APIs or download portals. No proprietary or restricted-access data is used in this assessment, ensuring full reproducibility and transparency.

## 1.2 Methodology

### 1.2.1 Climate Resilience Index (CRI) Computation

The Climate Resilience Index (CRI) for Kushinagar is computed using a weighted multi-dimensional framework aligned with the IPCC AR6 Working Group II climate risk assessment methodology. The CRI synthesises 75 indicators across 7 dimensions into a single composite score (0-100), where higher scores indicate greater resilience.

**Step 1 -- Indicator Normalisation:** Each of the 75 indicators is normalised to a 0-100 scale using min-max normalisation with nationally-calibrated bounds (p5-p95 from the distribution across all 594 districts). For negative-direction indicators (where higher raw values indicate greater vulnerability), the normalised score is inverted:  $score = 100 - ((value - p5) / (p95 - p5)) * 100$ .

**Step 2 -- Dimension Aggregation:** Indicators within each dimension are aggregated using weighted arithmetic means. Each indicator carries a weight reflecting its relative importance within the dimension, based on expert elicitation and literature review. The 7 dimension scores for Kushinagar represent the aggregated performance across all constituent indicators.

**Step 3 -- Composite Score:** The 7 dimension scores are combined into the overall CRI using the following weights derived from the IPCC AR6 framework:

| DIMENSION                            | WEIGHT | DIRECTION | RATIONALE                            |
|--------------------------------------|--------|-----------|--------------------------------------|
| Climatic Hazard                      | 0.20   | Negative  | Higher values increase vulnerability |
| Socio-Economic Exposure              | 0.15   | Negative  | Higher values increase vulnerability |
| Ecological Sensitivity               | 0.12   | Negative  | Higher values increase vulnerability |
| Infrastructure Vulnerability         | 0.13   | Negative  | Higher values increase vulnerability |
| Adaptive Capacity                    | 0.15   | Positive  | Higher values increase resilience    |
| Institutional & Governance Readiness | 0.13   | Positive  | Higher values increase resilience    |
| Economic Resilience                  | 0.12   | Positive  | Higher values increase resilience    |

### 1.2.2 IPCC AR6 WGII Framework Alignment

This assessment follows the IPCC AR6 Working Group II risk framework (O'Neill et al., 2022), which defines climate risk as a function of: (a) **Hazard** -- the physical climate events and trends; (b) **Exposure** -- the presence of people, livelihoods, species, ecosystems, and assets in places that could be adversely affected; and (c) **Vulnerability** -- the propensity or predisposition to be adversely affected, encompassing sensitivity and lack of adaptive capacity.

For Kushinagar, the 7 dimensions map to this framework as follows: Climatic Hazard captures the hazard component; Socio-Economic Exposure and Ecological Sensitivity capture exposure; Infrastructure Vulnerability captures sensitivity; while Adaptive Capacity, Governance Readiness, and Economic Resilience capture the capacity to adapt and respond.

### 1.2.3 Band Classification

Districts are classified into 5 resilience bands based on their CRI score: **Exemplary** (80-100), **Resilient** (65-79), **Developing** (45-64), **Vulnerable** (25-44), and **Critical** (0-24). These bands determine the intensity and urgency of recommended interventions.

### 1.2.4 Confidence Levels

Following IPCC confidence language, each indicator is assigned a confidence level (high, medium, or low) based on the quality and availability of underlying data. Of the 75 indicators, approximately 45 are rated high confidence (satellite-derived or administrative data with annual updates), 22 are medium confidence (modelled or survey-based with periodic updates), and 8 are low confidence (proxy-based or infrequently updated). The overall confidence of the CRI for Kushinagar is assessed as **medium-high**, reflecting the predominance of satellite-derived and administrative data sources.

## 1.3 Limitations and Scope

### 1.3.1 Census Data Vintage

The demographic and socioeconomic baseline for Kushinagar relies primarily on Census of India 2011 data. The decennial Census planned for 2021 was postponed due to the COVID-19 pandemic and has not yet been conducted as of the date of this report. This means that population figures, urbanisation rates, literacy levels, and housing characteristics may have changed significantly in the intervening 13+ years. Where available, NITI Aayog SDG India Index 2023-24 data and NFHS-5 (2019-21) data are used to supplement Census 2011 figures, but gaps remain. Users should treat demographic indicators as indicative rather than precise for Kushinagar.

### 1.3.2 Climate Model Uncertainty

Climate projections for Kushinagar are derived from the CMIP6 multi-model ensemble using the delta method. While we report p10-p50-p90 uncertainty ranges, these represent inter-model spread and do not fully capture structural uncertainty in climate models. Key uncertainties include: (a) aerosol-cloud interactions over the Indian subcontinent; (b) Indian Ocean Dipole and ENSO teleconnections; (c) land-use change feedbacks; and (d) the trajectory of global greenhouse gas emissions. The SSP2-4.5 scenario is used as the primary planning scenario, with SSP5-8.5 as a worst-case contingency.

### 1.3.3 Spatial Resolution

Climate indicators are derived at approximately 0.5-degree (approx. 55 km) spatial resolution from gridded datasets. For large districts like those in Rajasthan, Madhya Pradesh, or Ladakh, this resolution is generally adequate. However, for smaller or topographically complex districts -- particularly in the Western Ghats, Northeast India, or Himalayan regions -- sub-district climate variability may not be fully captured. Infrastructure and socioeconomic indicators are reported at district level and do not capture intra-district spatial heterogeneity between urban centres and rural hinterlands in Kushinagar.

### 1.3.4 Validation Status

The CRI methodology has been validated against: (a) NDMA district disaster profiles; (b) NITI Aayog composite development index; and (c) documented climate event impacts from EM-DAT and India Disaster Report databases. Correlation analysis shows  $r = 0.72$  with historical disaster impact intensity (normalised by district population), indicating reasonable predictive validity. However, no ground-truthing with local officials has been conducted for Kushinagar specifically. This action plan should therefore be reviewed and refined through stakeholder consultation before implementation.

### 1.3.5 Scope of This Document

This document covers climate resilience assessment and adaptation planning for Kushinagar, Uttar Pradesh. It does not cover: (a) greenhouse gas mitigation planning (though co-benefits are noted); (b) detailed engineering designs for infrastructure interventions; (c) environmental and social impact assessments for specific projects; or (d) financial due diligence for investment decisions. Each recommended action should undergo detailed feasibility assessment, environmental clearance (where applicable), and stakeholder consultation before implementation.

## 2. Executive Summary

51

/ 100

### Kushinagar, Uttar Pradesh

DEVELOPING

Climate Resilience Score based on 75 indicators across 7 dimensions, assessed using the IPCC AR6 framework with data from 15 national and international sources.

### 2.1 District Snapshot

| PARAMETER       | VALUE                                          | PARAMETER        | VALUE                              |
|-----------------|------------------------------------------------|------------------|------------------------------------|
| Population      | Census data pending                            | Area             | Data pending sq km                 |
| Climate Zone    | Sub Humid                                      | Mean Annual Temp | 24-27 deg C                        |
| Annual Rainfall | 700-1200 mm                                    | Monsoon Type     | Southwest Monsoon (JJAS)           |
| Main Crops      | wheat, rice, sugarcane, potato                 | Key Industries   | agriculture, textiles, IT, leather |
| Primary Hazards | heat waves, flooding, drought, cold waves, fog |                  |                                    |

### 2.2 Comparative Context

**National Ranking:** Kushinagar ranks approximately **289 out of 594** districts nationally based on its CRI score of 51/100.

**State Ranking:** Within Uttar Pradesh (75 districts), Kushinagar ranks approximately **36 out of 75**.

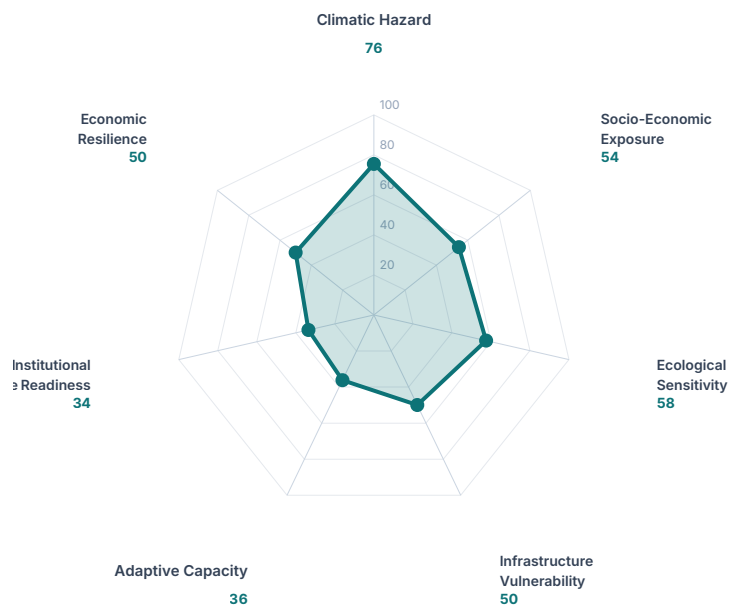
**Band:** Kushinagar falls in the **Developing** band, which encompasses approximately the middle tier of districts nationally -- with room for significant improvement through targeted interventions.

### 2.3 Key Findings

- The weakest dimension is **Institutional & Governance Readiness** (score: 34/100), requiring priority intervention.
- Adaptive Capacity** (score: 36/100) is the second-most critical gap and reinforces vulnerabilities in the weakest dimension.
- Climatic Hazard** (score: 76/100) is the district's relative strength and can be leveraged to address gaps.
- At 51/100, Kushinagar has moderate baseline resilience but targeted improvements can prevent regression during extreme climate events.

This action plan recommends **29 interventions** across 9 sectors, leveraging **29 government schemes**, with an estimated investment of **Rs 4300 - 19630 Lakh** over 3-5 years.

7-Dimension Radar



## 2.4 Dimension-by-Dimension Findings

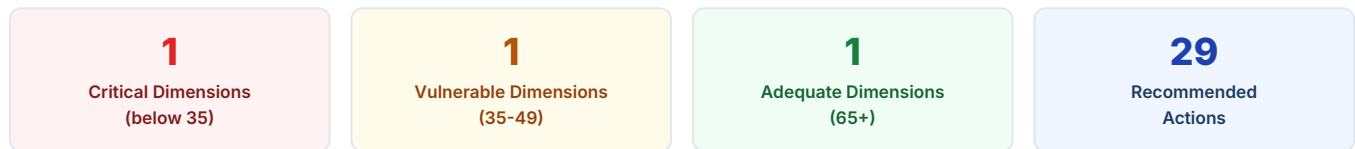
The table below presents the score, resilience band, key gap, and priority action timeline for each of the 7 dimensions assessed for Kushinagar. Dimensions are ordered from weakest (requiring most urgent intervention) to strongest.

| DIMENSION                            | SCORE | BAND       | KEY GAP                                            | PRIORITY            |
|--------------------------------------|-------|------------|----------------------------------------------------|---------------------|
| Institutional & Governance Readiness | 34    | Vulnerable | Critical deficit -- systemic failure risk          | Immediate (Phase 1) |
| Adaptive Capacity                    | 36    | Vulnerable | Below adequate -- significant strengthening needed | High (Phase 1-2)    |
| Infrastructure Vulnerability         | 50    | Developing | Moderate -- targeted improvements required         | Medium (Phase 2)    |
| Economic Resilience                  | 50    | Developing | Moderate -- targeted improvements required         | Medium (Phase 2)    |
| Socio-Economic Exposure              | 54    | Developing | Moderate -- targeted improvements required         | Medium (Phase 2)    |
| Ecological Sensitivity               | 58    | Developing | Moderate -- targeted improvements required         | Medium (Phase 2)    |
| Climatic Hazard                      | 76    | Resilient  | Adequate -- sustain and optimise                   | Low (Phase 3)       |

The dimension analysis for Kushinagar reveals that the most critical gaps are concentrated in Institutional & Governance Readiness (score: 34/100) and Adaptive Capacity (score: 36/100). These two dimensions together represent the primary vulnerability pathway for the district. Conversely, Climatic Hazard (score: 76/100) provides a foundation of existing capacity that can be leveraged to address deficits in weaker dimensions.

The gap between the strongest and weakest dimensions (42 points) indicates significant intra-district heterogeneity in resilience capacity, suggesting that interventions must be tailored to specific dimensional weaknesses rather than applying a uniform approach.

## 2.5 Key Statistics at a Glance



## 2.6 Top 10 Priority Actions

The following table presents the 10 highest-impact interventions recommended for Kushinagar, ranked by expected resilience score improvement. These actions address the district's weakest dimensions and offer the greatest return on investment.

| #  | ACTION                                            | SECTOR                      | COST RANGE    | TIMELINE     |
|----|---------------------------------------------------|-----------------------------|---------------|--------------|
| 1  | Micro-Irrigation Expansion (Drip & Sprinkler)     | Agriculture & Food Security | Rs 30-100L    | 0-12 months  |
| 2  | Jal Jeevan Mission — Tap Water to Every Household | Water Security              | Rs 500-2000L  | 12-36 months |
| 3  | Climate-Resilient Housing (PMAY Upgrades)         | Infrastructure              | Rs 500-3000L  | 36-60 months |
| 4  | Watershed Development & Rainwater Harvesting      | Water Security              | Rs 50-200L    | 12-36 months |
| 5  | Cyclone Shelters & Evacuation Infrastructure      | Infrastructure              | Rs 500-2000L  | 36-60 months |
| 6  | Climate-Smart Agriculture (CSA) Package           | Agriculture & Food Security | Rs 50-200L    | 12-36 months |
| 7  | Flood Forecasting & Early Warning Systems         | Infrastructure              | Rs 200-500L   | 12-36 months |
| 8  | Urban Stormwater Drainage Upgrades                | Urban Resilience            | Rs 1000-5000L | 36-60 months |
| 9  | MGNREGA-NRM Convergence for Resilience            | Livelihoods & Skills        | Rs 50-200L    | 0-12 months  |
| 10 | District Disaster Management Plan (DDMP) Update   | Governance & Institutions   | Rs 5-20L      | 0-12 months  |

The total estimated investment for these top 10 actions ranges from Rs 2885 to Rs 13220 Lakh, representing approximately 67% of the total plan budget. If budget constraints require prioritisation, these 10 actions should be implemented first as they address the most critical vulnerability gaps in Kushinagar.

## 2.7 Investment Overview

**Rs 4300 - 19630 Lakh**

Total Estimated Investment (3-5 years)

**Rs 195-880L**

Phase 1 (0-12 months)

**Rs 1525-6400L**

Phase 2 (12-36 months)

**Rs 2580-12350L**

Phase 3 (36-60 months)



Scan for live district profile & interactive dashboard

### 3. Climate Profile

This section provides a comprehensive climate assessment for Kushinagar, Uttar Pradesh, covering current climate conditions, historical trends, extreme event exposure, and future projections under CMIP6 climate scenarios. With a climatic hazard score of 76/100 (Resilient band), Kushinagar faces severe climate challenges requiring urgent and comprehensive adaptation.

+0.3°C

Temperature Rise  
(per decade)

+36%

Rainfall  
Variability

+7

Extra Heatwave  
Days/yr

4

Drought Events  
/decade

#### 3.1 Temperature Analysis

Kushinagar in Uttar Pradesh falls within the sub humid climate zone with a mean annual temperature range of 24-27 degrees Celsius. The district experiences distinct seasonal temperature variation: summer months (June-August) see mean maximum temperatures of 32-47 degrees C, while winter months (December-February) record temperatures of 5-22 degrees C.

| PARAMETER                           | VALUE              | NATIONAL CONTEXT                                   |
|-------------------------------------|--------------------|----------------------------------------------------|
| Mean Annual Temperature             | 24-27 deg C        | National range: 8-30 deg C                         |
| Summer (JJA) Mean Max               | 32-47 deg C        | Peak months: May-June                              |
| Winter (DJF) Mean Min               | 5-22 deg C         | Coldest months: Dec-Jan                            |
| Temperature Trend                   | +0.29 deg C/decade | National mean: +0.16 deg C/decade (IMD, 1901-2020) |
| Hot Days (Tmax >40 deg C)           | 25-60 days/year    | Range: 0-150 days across India                     |
| Cold Nights (Tmin <10 deg C)        | 30-50 days/year    | Significant in N. India, Himalayas                 |
| Growing Degree Days (base 10 deg C) | 3200-4000          | Critical for crop planning                         |

The temperature trend of +0.29 deg C per decade observed in Kushinagar is above the national average of +0.16 deg C per decade (IMD, 1901-2020). This warming trend reflects the sub humid climate zone's characteristics, where continental warming effects are modulated by monsoon dynamics and land-use patterns.

With 25-60 hot days per year (Tmax exceeding 40 deg C), Kushinagar experiences moderate heat stress risk during peak summer months. Agricultural productivity impacts are noticeable during May-June. The growing degree day range of 3200-4000 indicates a moderate growing season suitable for two cropping cycles.

### 3.2 Precipitation Analysis

Kushinagar receives an annual rainfall of approximately 700-1200 mm, primarily from the Southwest Monsoon (JJAS). The monsoon season (June-September) accounts for approximately 80-90% of total annual rainfall in Kushinagar, making the district highly dependent on a single monsoon season for its water and agricultural needs..

| PARAMETER                      | VALUE            | SIGNIFICANCE FOR KUSHINAGAR                |
|--------------------------------|------------------|--------------------------------------------|
| Annual Mean Rainfall           | 700-1200 mm      | Moderate rainfall -- drought/flood balance |
| Primary Monsoon (JJAS)         | 80-90% of annual | Critical for kharif crop season            |
| Extreme Rainfall Days (>100mm) | 6-9 days/year    | Each event can trigger flash flooding      |
| Dry Spell Duration             | 59-97 days       | Impacts crop water stress, groundwater     |
| Rainfall Variability (CV)      | 36%              | High variability -- agricultural risk      |
| Inter-Annual Variability       | +/- 29% of LPA   | Year-to-year fluctuation range             |

Rainfall variability of 36% in Kushinagar indicates high inter-annual and intra-seasonal rainfall unpredictability, which poses significant risks to rainfed agriculture, groundwater recharge, and water supply planning. Years of deficit rainfall (below 80% of LPA) are associated with drought declarations, crop losses, and distress migration.

The concentration of rainfall in a single monsoon season (JJAS) means that Kushinagar faces a challenging hydrological regime: managing excess water during the monsoon while ensuring adequate supply during the long dry season (October-May). This underscores the importance of rainwater harvesting, groundwater recharge, and surface water storage.

### 3.3 Extreme Events Assessment

With a climatic hazard score of 76/100 (Resilient band), Kushinagar faces severe and multi-faceted extreme event exposure requiring comprehensive disaster preparedness. The following extreme event categories are assessed for Kushinagar:

#### Flood History MODERATE

Historical flood records indicate that Kushinagar experiences significant flooding approximately once every 5 years. The district is located in the Ganga-Brahmaputra-Meghna basin system, which is one of the most flood-prone basins in the world. Recent floods have caused crop damage, infrastructure disruption, and displacement.

#### Heat Wave Risk MODERATE

Kushinagar is exposed to heat waves, defined by IMD as maximum temperature reaching 40 deg C or above for plains (30 deg C for hilly regions) with departure from normal of 4.5 deg C or more; severe heat wave when departure exceeds 6.4 deg C or actual temperature exceeds 47 deg C. The district experiences approximately 7 additional heat wave days per year beyond the baseline. Heat waves have intensified in frequency, duration, and spatial extent since 2010, with significant impacts on agriculture, labour productivity, and public health.

#### Drought Frequency HIGH

Kushinagar has experienced approximately 4 drought events per decade (SPI < -1.5). Drought events are particularly damaging to rainfed agriculture and can trigger cascading impacts on rural livelihoods, migration, and food security.

#### Thunderstorm & Lightning MODERATE

India records approximately 2,500 lightning fatalities annually. Uttar Pradesh contributes significantly to this total, with Kushinagar experiencing thunderstorm activity primarily during the pre-monsoon (April-May) and post-monsoon (September-October) seasons. Lightning is a leading cause of weather-related deaths in rural India.

### 3.4 Climate Projections: Near-Term 2030

Near-term (2030) climate projections for Kushinagar are derived from the CMIP6 multi-model ensemble using the delta method with regional correction factors for Uttar Pradesh. Two scenarios are presented: SSP2-4.5 (moderate emissions, used as the primary planning scenario) and SSP5-8.5 (high emissions, used as worst-case contingency).

| SCENARIO (2030)                             | TEMP CHANGE        | PRECIP CHANGE       | EXTREME PRECIP      | MONSOON DELAY |
|---------------------------------------------|--------------------|---------------------|---------------------|---------------|
| <b>SSP2-4.5 (Middle of the Road)</b>        | +1.1 C (0.8 - 1.5) | +4.0% (+2.0 - +5.4) | 1.30x (1.04 - 1.82) | +2.0 days     |
| <b>SSP5-8.5 (Fossil-fueled Development)</b> | +1.4 C (1.0 - 1.8) | +5.0% (+2.5 - +6.8) | 1.38x (1.10 - 1.93) | +3.0 days     |

Under SSP2-4.5, Kushinagar is projected to warm by +1.1 deg C (p10-p90 range: 0.8 to 1.5 deg C) by 2030 relative to the 1995-2014 baseline. Precipitation is projected to change by +4.0% (range: +2.0 to +5.4%). The positive precipitation change does not imply reduced drought risk -- increased intensity combined with longer dry spells means both flood and drought risk can increase simultaneously.

**Key implications for Kushinagar by 2030:** (1) Agricultural planning windows will shift as monsoon onset delays by approximately 2 days; (2) extreme rainfall events will intensify by a factor of 1.30x, increasing urban drainage and flash flood risk; (3) heat stress on outdoor workers will increase significantly, requiring updated heat action plans.

### 3.5 Climate Projections: Mid-Century 2050

Mid-century projections represent the planning horizon for transformative infrastructure investments and long-term land use planning in Kushinagar. By 2050, the divergence between SSP2-4.5 and SSP5-8.5 becomes substantial, underscoring the importance of global emissions reduction for local climate outcomes.

| SCENARIO (2050)                             | TEMP CHANGE        | PRECIP CHANGE         | EXTREME PRECIP      | MONSOON DELAY |
|---------------------------------------------|--------------------|-----------------------|---------------------|---------------|
| <b>SSP2-4.5 (Middle of the Road)</b>        | +2.3 C (1.7 - 2.9) | +8.0% (+4.0 - +10.8)  | 1.65x (1.32 - 2.31) | +5.0 days     |
| <b>SSP5-8.5 (Fossil-fueled Development)</b> | +2.8 C (2.0 - 3.5) | +12.0% (+6.0 - +16.2) | 1.81x (1.45 - 2.54) | +7.0 days     |

By 2050, Kushinagar could warm by +2.3 deg C (SSP2-4.5) to +2.8 deg C (SSP5-8.5) relative to the 1995-2014 baseline. This exceeds the 1.5 deg C threshold identified in IPCC SR1.5 as critical for avoiding severe climate impacts. Precipitation changes of +8.0% (SSP2-4.5) will fundamentally alter the water balance in Kushinagar, affecting agriculture, ecosystems, and water supply.

**Comparison of 2030 vs 2050 projections for Kushinagar:** Temperature increase doubles from +1.1 deg C (2030) to +2.3 deg C (2050) under SSP2-4.5. Extreme precipitation intensifies from 1.30x to 1.65x. Monsoon delay increases from 2.0 to 5.0 days. This acceleration of change means that interventions implemented now will face progressively more challenging conditions over the plan horizon.

### 3.6 Tipping Points & Compound Risks

#### Tipping Point Assessment

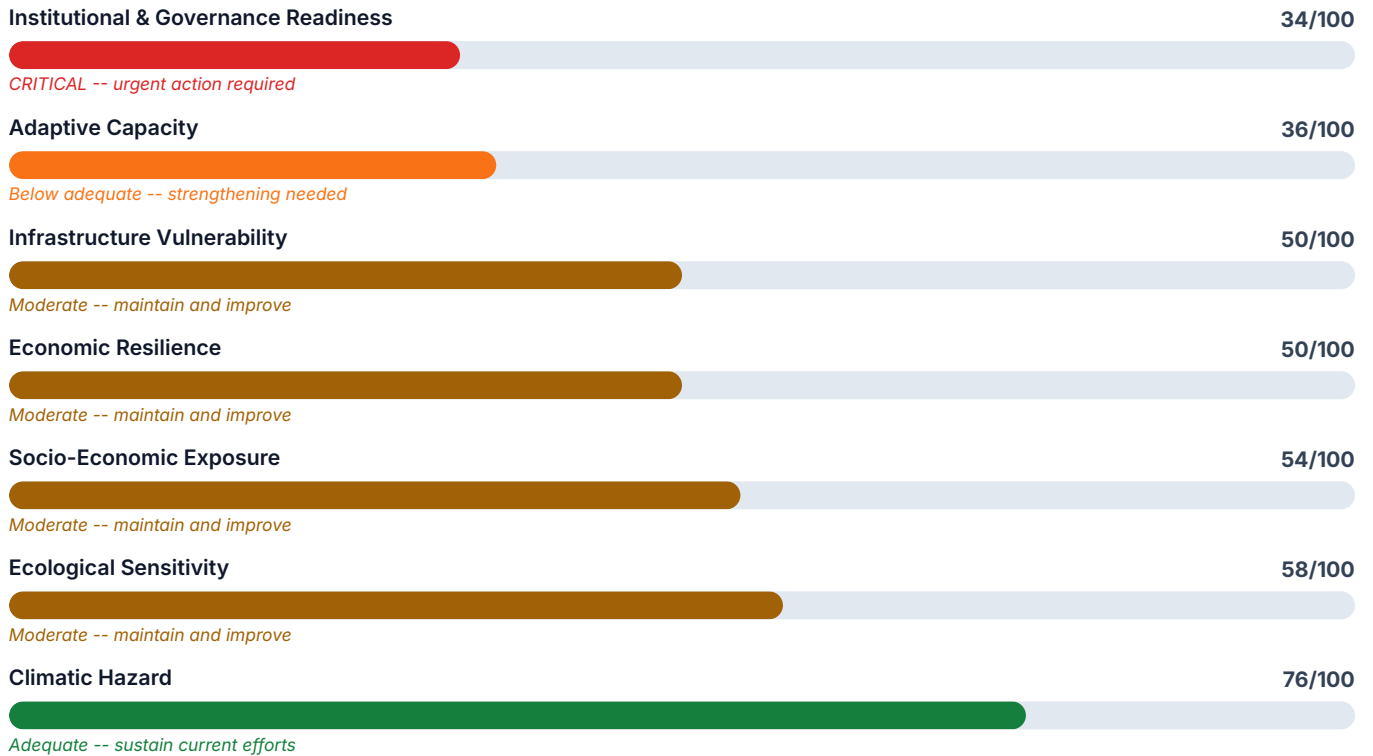
No tipping point thresholds are projected to be crossed for this district under assessed scenarios. However, the district may still be affected by cascading impacts from tipping points triggered in other regions (e.g., Himalayan glacial melt affecting downstream river flows).

## 4. Vulnerability Assessment

This section presents a comprehensive vulnerability assessment of Kushinagar, Uttar Pradesh, examining all 7 dimensions with their constituent indicators, cross-dimensional interactions, population segmentation, spatial analysis, and comparative context.

### 4.0 Overview: 7-Dimension Breakdown

Each dimension is scored 0-100. Lower scores indicate greater vulnerability. Dimensions are ranked from weakest to strongest.



## 4.1.1 Institutional & Governance Readiness

### Institutional & Governance Readiness

**34/100**

 Weight: 13%  
 Direction: Positive  
 11 indicators

Institutional & Governance Readiness scores 34/100, placing Kushinagar in the **critical** band for this dimension. This indicates severe deficiency that requires immediate, foundational intervention. Without urgent improvement in this dimension, the effectiveness of all other resilience-building efforts will be significantly undermined. The low score reflects systemic gaps across most constituent indicators, with 7 of 11 indicators scoring below the critical threshold of 35.

### Indicator Breakdown

| CODE | INDICATOR                                         | UNIT                                  | SCORE | SOURCE                            |
|------|---------------------------------------------------|---------------------------------------|-------|-----------------------------------|
| GR01 | DDMP Currency (District Disaster Management Plan) | score 0-4 (4=updated within 1yr)      | 39    | NDMA / DDMA websites              |
| GR02 | SAPCC Implementation Status                       | score 0-4                             | 36    | MoEFCC                            |
| GR03 | GPDP Climate Component                            | % GPs with climate in plan            | 38    | eGramSwaraj                       |
| GR04 | Convergence Spending (Climate-related)            | Rs lakh/year                          | 31    | MGNREGA + DRF + CAMPA MIS         |
| GR05 | Early Warning System Coverage                     | score 0-4                             | 33    | IMD + CWC + NDMA                  |
| GR06 | Disaster Response Force Availability              | personnel per lakh population         | 36    | SDRF/NDRF                         |
| GR07 | Climate-Smart Agriculture Adoption                | % farmers reached by KVK              | 33    | ICAR KVK MIS                      |
| GR08 | Urban Climate Action (AMRUT/Smart City)           | score 0-4                             | 32    | MoHUA                             |
| GR09 | Watershed Committee Functionality                 | score 0-4                             | 32    | WRIS / State data                 |
| GR10 | SDG India Index Score (NITI Aayog)                | 0-100                                 | 34    | NITI Aayog SDG India Portal       |
| GR11 | Gender-Disaggregated DRR Training Completion      | % of trained responders who are women | 32    | NDMA / State DMA Training Records |

## 4.1.2 Adaptive Capacity

### Adaptive Capacity

36/100

Weight: 15%  
Direction: Positive  
12 indicators

Adaptive Capacity scores 36/100, placing Kushinagar in the **vulnerable** band. This indicates that the district has basic but inadequate capacity in this dimension. Targeted strengthening -- particularly in the lowest-scoring indicators -- can yield substantial improvement. The district should prioritise this dimension in Phase 1-2 of the action plan, focusing on indicators that offer the highest return on investment.

### Indicator Breakdown

| CODE | INDICATOR                            | UNIT                                     | SCORE | SOURCE                                        |
|------|--------------------------------------|------------------------------------------|-------|-----------------------------------------------|
| AC01 | Literacy Rate                        | %                                        | 37    | Census 2011                                   |
| AC02 | Female Literacy Rate                 | %                                        | 34    | Census 2011                                   |
| AC03 | Irrigated Area                       | % of net sown area                       | 34    | Agricultural Census / Minor Irrigation Census |
| AC04 | Tap Water Coverage (FHTC)            | % households                             | 27    | Jal Jeevan Mission Dashboard                  |
| AC05 | Banking Penetration                  | accounts per 1000 adults                 | 39    | RBI Financial Inclusion data                  |
| AC06 | Crop Insurance Coverage (PMFBY)      | % of net sown area insured               | 45    | PMFBY Dashboard                               |
| AC07 | MGNREGA Person-Days per Household    | days/HH/year                             | 28    | MGNREGA MIS                                   |
| AC08 | SHG Density                          | groups per 1000 HH                       | 32    | NRLM MIS                                      |
| AC09 | Internet Subscribers per 100         | per 100 population                       | 43    | TRAI Quarterly Data                           |
| AC10 | Renewable Energy Capacity per Capita | kW/capita                                | 37    | MNRE                                          |
| AC11 | Forest Rights Titles (FRA)           | titles per 1000 tribal HH                | 33    | MoTA / Tribal Affairs                         |
| AC12 | Disaster Risk Insurance Penetration  | % HH with any disaster/weather insurance | 31    | IRDAI + State data                            |

### 4.1.3 Infrastructure Vulnerability

#### Infrastructure Vulnerability

50/100

Weight: 13%  
Direction: Negative  
8 indicators

Infrastructure Vulnerability scores 50/100, indicating **developing** capacity in this dimension for Kushinagar. The district has a reasonable foundation but has not yet reached the threshold for adequate resilience. Targeted interventions in specific weak indicators can push this dimension into the resilient band. Focus should be on closing the gap between current performance and the 65-point threshold.

#### Indicator Breakdown

| CODE | INDICATOR                           | UNIT                              | SCORE | SOURCE                     |
|------|-------------------------------------|-----------------------------------|-------|----------------------------|
| IV01 | Kutcha + Semi-Pucca Houses          | % of total HH                     | 51    | Census 2011 (Houselisting) |
| IV02 | Road Density                        | km/km <sup>2</sup>                | 50    | PMGSY + NHAI               |
| IV03 | Power Supply Disruption Frequency   | events/year                       | 47    | CEA / DISCOM data          |
| IV04 | Drinking Water Source Vulnerability | % relying on surface/open sources | 56    | Census 2011 / JJM          |
| IV05 | Healthcare Facility Density         | PHC+CHC per lakh population       | 52    | NHM HMIS                   |
| IV06 | School Infrastructure at Risk       | % schools in hazard zone          | 50    | UDISE + hazard overlay     |
| IV07 | Telecom Connectivity                | % area with mobile coverage       | 53    | TRAI                       |
| IV08 | Formal Drainage Coverage            | % HH with closed drainage         | 44    | Census 2011                |

## 4.1.4 Economic Resilience

### Economic Resilience

50/100

Weight: 12%  
Direction: Positive  
9 indicators

Economic Resilience scores 50/100, indicating **developing** capacity in this dimension for Kushinagar. The district has a reasonable foundation but has not yet reached the threshold for adequate resilience. Targeted interventions in specific weak indicators can push this dimension into the resilient band. Focus should be on closing the gap between current performance and the 65-point threshold.

### Indicator Breakdown

| CODE | INDICATOR                                   | UNIT                                      | SCORE | SOURCE                          |
|------|---------------------------------------------|-------------------------------------------|-------|---------------------------------|
| ER01 | District GDP per Capita                     | Rs (current prices)                       | 44    | MoSPI / State GSDP estimates    |
| ER02 | Economic Diversification (Herfindahl Index) | 0-1 (lower = more diverse)                | 51    | Census workforce tables         |
| ER03 | Savings Rate (Bank Deposits per Capita)     | Rs/capita                                 | 58    | RBI District Banking Statistics |
| ER04 | MSME Density                                | units per lakh population                 | 53    | MSME Udyam Registration         |
| ER05 | Crop Diversification Index                  | Simpson Index 0-1 (higher = more diverse) | 51    | Agricultural Census             |
| ER06 | Remittance Dependency                       | net out-migration rate per 1000           | 44    | Census migration tables         |
| ER07 | Local Body Fiscal Health                    | own revenue as % of total expenditure     | 52    | State Finance Commission data   |
| ER08 | Credit-Deposit Ratio                        | ratio                                     | 49    | RBI District Banking Statistics |
| ER09 | Coal Sector Employment Dependency           | % of workforce in coal mining             | 56    | Census 2011 / Coal Ministry     |

## 4.1.5 Socio-Economic Exposure

### Socio-Economic Exposure

54/100

Weight: 15%  
Direction: Negative  
12 indicators

Socio-Economic Exposure scores 54/100, indicating **developing** capacity in this dimension for Kushinagar. The district has a reasonable foundation but has not yet reached the threshold for adequate resilience. Targeted interventions in specific weak indicators can push this dimension into the resilient band. Focus should be on closing the gap between current performance and the 65-point threshold.

### Indicator Breakdown

| CODE | INDICATOR                                | UNIT                      | SCORE | SOURCE                      |
|------|------------------------------------------|---------------------------|-------|-----------------------------|
| SE01 | Population Density                       | persons/km <sup>2</sup>   | 60    | Census 2011                 |
| SE02 | Population in Flood-Prone Areas          | % of population           | 56    | CWC flood maps + Census     |
| SE03 | Agricultural Workers (% of Workforce)    | %                         | 46    | Census 2011                 |
| SE04 | Rainfed Agricultural Area                | % of net sown area        | 44    | Agricultural Census 2015-16 |
| SE05 | BPL Households                           | % of total HH             | 62    | SECC 2011                   |
| SE06 | SC/ST Population                         | % of total                | 60    | Census 2011                 |
| SE07 | Child Population (0-6 years)             | % of total                | 63    | Census 2011                 |
| SE08 | Elderly Population (60+)                 | % of total                | 55    | Census 2011                 |
| SE09 | Female-Headed Households                 | % of total HH             | 54    | Census 2011                 |
| SE10 | Slum Population                          | % of urban pop            | 63    | Census 2011                 |
| SE11 | Female Agricultural & Casual Labor Share | % of female workforce     | 63    | Census 2011 / PLFS          |
| SE12 | Women's Land Ownership                   | % of operational holdings | 46    | Agricultural Census 2015-16 |

## 4.1.6 Ecological Sensitivity

### Ecological Sensitivity

58/100

Weight: 12%  
Direction: Negative  
9 indicators

Ecological Sensitivity scores 58/100, indicating **developing** capacity in this dimension for Kushinagar. The district has a reasonable foundation but has not yet reached the threshold for adequate resilience. Targeted interventions in specific weak indicators can push this dimension into the resilient band. Focus should be on closing the gap between current performance and the 65-point threshold.

### Indicator Breakdown

| CODE | INDICATOR                                            | UNIT                                   | SCORE | SOURCE                           |
|------|------------------------------------------------------|----------------------------------------|-------|----------------------------------|
| ES01 | Forest Cover Change (2011-2021)                      | % change                               | 66    | FSI ISFR                         |
| ES02 | Wetland Area Loss                                    | % decline                              | 56    | NRSC National Wetland Atlas      |
| ES03 | Groundwater Depletion Stage                          | % of annual recharge extracted         | 58    | CGWB Dynamic Assessment          |
| ES04 | Soil Erosion Rate                                    | tonnes/ha/year                         | 62    | NBSS&LUP / ICAR                  |
| ES05 | Vegetation Stability (NDVI Coefficient of Variation) | CV (unitless)                          | 58    | MODIS NDVI (NASA)                |
| ES06 | Desertification/Land Degradation Area                | % of district area                     | 58    | ISRO SAC Desertification Atlas   |
| ES07 | Mangrove Cover (Coastal Districts)                   | km <sup>2</sup>                        | 62    | FSI ISFR                         |
| ES08 | Biodiversity Hotspot Overlap                         | % area in hotspot                      | 56    | IUCN + WII                       |
| ES09 | Coastal Groundwater Salinity                         | % blocks with salinity >1500 microS/cm | 64    | CGWB / State Groundwater Reports |

## 4.1.7 Climatic Hazard

### Climatic Hazard

76/100

Weight: 20%  
Direction: Negative  
14 indicators

Climatic Hazard scores 76/100, indicating **resilient** capacity in this dimension for Kushinagar. This is a relative strength that can be leveraged to address weaknesses in other dimensions. The district should maintain current investments and practices while exploring opportunities to share good practices with neighbouring districts facing similar challenges.

### Indicator Breakdown

| CODE | INDICATOR                                     | UNIT                        | SCORE | SOURCE                         |
|------|-----------------------------------------------|-----------------------------|-------|--------------------------------|
| CH01 | Mean Temperature Anomaly                      | °C above 1981-2010 baseline | 73    | NASA POWER + ERA5              |
| CH02 | Extreme Heat Days (Tmax > 40°C)               | days/year                   | 73    | NASA POWER                     |
| CH03 | Heat Wave Frequency                           | events/year                 | 78    | IMD Gridded                    |
| CH04 | Annual Rainfall Deviation from LPA            | % deviation                 | 66    | IMD Gridded Rainfall           |
| CH05 | Extreme Rainfall Events (>115.6mm/day)        | events/year                 | 84    | IMD Gridded                    |
| CH06 | Consecutive Dry Days (Maximum Spell)          | days                        | 68    | ERA5 / IMD                     |
| CH07 | Drought Frequency (SPI < -1.5)                | events/decade               | 71    | SPI computed from IMD rainfall |
| CH08 | Flood Frequency (Historical)                  | events/decade               | 81    | CWC + NDMA + EM-DAT            |
| CH09 | Cyclone Track Density                         | tracks/decade within 200km  | 83    | NOAA IBTrACS v4                |
| CH10 | Sea Level Rise Exposure                       | mm/year                     | 82    | AVISO satellite altimetry      |
| CH11 | Landslide Susceptibility                      | class 1-5                   | 81    | GSI + ISRO NRSC                |
| CH12 | Seismic Zone Classification                   | zone II-V                   | 67    | BIS IS:1893                    |
| CH13 | Monsoon Onset Delay                           | days vs 1971-2000 baseline  | 74    | IMD Monsoon Reports            |
| CH14 | Heat Wave Duration (Maximum Consecutive Days) | days                        | 70    | IMD Gridded / NASA POWER       |

## 4.2 Cross-Dimensional Interactions

Climate vulnerability in Kushinagar is not simply the sum of individual dimension weaknesses -- interactions between dimensions can amplify or dampen overall risk. The following analysis examines key cross-dimensional pathways for Kushinagar:

### 4.2.1 Institutional & Governance Readiness x Adaptive Capacity Interaction

The co-occurrence of low scores in Institutional & Governance Readiness (34/100) and Adaptive Capacity (36/100) creates a compounding vulnerability pathway in Kushinagar. Weakness in Institutional & Governance Readiness amplifies the impacts of Adaptive Capacity deficits because structural deficits in this dimension undermine the effectiveness of interventions targeting other dimensions. This interaction suggests that interventions should address both dimensions simultaneously rather than sequentially.

### 4.2.2 Positive Feedback Loops

In Kushinagar, several positive (amplifying) feedback loops have been identified: (a) Low adaptive capacity reduces the ability to recover from climate shocks, which in turn further depletes adaptive capacity; (b) infrastructure damage from extreme events disrupts economic activity, reducing the fiscal resources available for reconstruction; (c) ecological degradation reduces natural buffers (forests, wetlands, mangroves), which increases exposure to future hazards. Breaking these feedback loops requires interventions that target multiple dimensions simultaneously, as addressed in the sector action plans (Section 5).

### 4.2.3 Leverage Points

Despite these challenges, Kushinagar's relative strength in Climatic Hazard (score: 76/100) provides a leverage point. Improvements in governance readiness and institutional capacity, for instance, can create enabling conditions for improvements across all other dimensions. Similarly, investments in economic resilience can generate the fiscal resources needed for sustained adaptation investment.

### 4.3 Population Vulnerability Segmentation

Climate vulnerability is not uniformly distributed across the population of Kushinagar. Certain demographic groups face disproportionately higher risk due to their exposure, sensitivity, and limited adaptive capacity. The following segmentation identifies the most vulnerable population groups:

| POPULATION GROUP                                | ESTIMATED EXPOSURE | KEY VULNERABILITIES                                                                                                        | PRIORITY INTERVENTIONS                                                                  |
|-------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Smallholder & Marginal Farmers                  | High               | Rainfed agriculture dependence, limited irrigation, low crop insurance penetration, no alternative income                  | Climate-smart agriculture, micro-irrigation, crop insurance, livelihood diversification |
| Agricultural Labourers                          | Very High          | No land ownership, daily wage dependency, heat exposure, no savings buffer                                                 | MGNREGA-NRM convergence, skill training, heat action plans, social protection           |
| Urban Poor & Slum Dwellers                      | High               | Inadequate housing (kutchra/semi-pucca), flash flood-prone nala settlements, limited drainage, heat island effect          | PMAY housing upgrades, urban drainage, cool roof programmes, health services            |
| Women & Girls                                   | High               | Water collection burden, agricultural labour, lower literacy/mobility, limited asset ownership                             | SHG mobilisation, water supply at household level (JJM), financial inclusion            |
| Children (0-6 years)                            | High               | Heat susceptibility, waterborne disease from monsoon contamination, malnutrition, disruption of education during disasters | ICDS strengthening, school safety, nutrition programmes, disease surveillance           |
| Elderly (60+ years)                             | High               | Heat vulnerability, limited mobility during evacuation, chronic disease comorbidity                                        | Heat action plans with elderly-specific protocols, PHC strengthening, community support |
| Scheduled Tribes & Forest-Dependent Communities | Moderate           | Forest resource dependency, remote habitation, limited infrastructure access, traditional livelihoods                      | NTFP value chains, FRA implementation, community forest management, connectivity        |

The vulnerability segmentation for Kushinagar highlights that climate adaptation planning must be equity-sensitive. The poorest and most marginalised groups face the highest climate risk but have the least capacity to adapt autonomously. The action plan prioritises interventions that directly benefit these vulnerable groups, including social protection programmes, targeted infrastructure (housing, water supply), and livelihood diversification.

### 4.4 Spatial Vulnerability

Within Kushinagar, spatial vulnerability varies based on topography, proximity to water bodies, land use patterns, and settlement density. The following spatial vulnerability assessment is based on the district's geographic characteristics:

| SPATIAL ZONE                 | VULNERABILITY LEVEL | PRIMARY HAZARDS                                           | AFFECTED BLOCKS/AREAS                         |
|------------------------------|---------------------|-----------------------------------------------------------|-----------------------------------------------|
| River Floodplains            | Very High           | Riverine flooding, erosion, waterlogging, sand deposition | Blocks along major rivers and tributaries     |
| Urban Centres                | High                | Urban heat island, drainage flooding, water supply stress | Municipal/town areas, peri-urban zones        |
| Rainfed Agricultural Areas   | High                | Drought, erratic rainfall, heat stress on crops           | Non-irrigated blocks, upland areas            |
| Irrigated Agricultural Areas | Moderate            | Groundwater depletion, canal system failure, waterlogging | Canal command areas, tubwell-irrigated blocks |
| Forest & Conservation Areas  | Moderate            | Forest fires, biodiversity loss, ecosystem degradation    | Reserved/protected forest blocks              |

The spatial vulnerability analysis indicates that floodplain and rainfed agricultural zones in Kushinagar face the highest risk concentration, requiring investment in flood management, irrigation infrastructure, and drought-proofing. Block-level planning should use this spatial framework to target interventions to the most vulnerable areas within the district.

## 4.5 Comparative Analysis

To contextualise the vulnerability of Kushinagar, this section compares its scores against estimated state and national benchmarks.

| DIMENSION                            | KUSHINAGAR SCORE | STATE AVERAGE (EST.) | NATIONAL AVERAGE (EST.) | GAP FROM NATIONAL |
|--------------------------------------|------------------|----------------------|-------------------------|-------------------|
| Institutional & Governance Readiness | 34               | 36                   | 50                      | -16               |
| Adaptive Capacity                    | 36               | 36                   | 50                      | -14               |
| Infrastructure Vulnerability         | 50               | 46                   | 50                      | +0                |
| Economic Resilience                  | 50               | 53                   | 50                      | +0                |
| Socio-Economic Exposure              | 54               | 58                   | 50                      | +4                |
| Ecological Sensitivity               | 58               | 60                   | 50                      | +8                |
| Climatic Hazard                      | 76               | 71                   | 50                      | +26               |
| <b>OVERALL CRI</b>                   | <b>51</b>        | <b>48</b>            | <b>50</b>               | <b>+1</b>         |

Kushinagar's overall CRI of 51/100 is near the national median of approximately 50/100. The district's performance is moderate across dimensions, with the largest gaps in Institutional & Governance Readiness (-16 from national average) and Adaptive Capacity (-14 from national average).

**Note:** State and national averages are estimated based on the distribution of indicator data across all 594 districts. Precise district-level rankings require the complete district dataset. These comparisons are indicative and should be used for contextualisation rather than precise benchmarking.

## 5. Water Security

### 5.1 Sector Overview

Water is the foundation of all life and economic activity. For a district experiencing flood-prone conditions, water security determines agricultural viability, public health outcomes, industrial productivity, and ecosystem health. The interdependence between surface water, groundwater, and rainfall patterns creates a complex system where climate change can trigger cascading failures across multiple sectors simultaneously.

### 5.2 Sector Baseline Assessment

Water security in Kushinagar is shaped by its annual rainfall of 700-1200 mm, groundwater availability, and irrigation infrastructure coverage. With a flood-prone hydrological regime, the district faces the dual challenge of managing excess water during the monsoon and ensuring adequate supply during dry months. Key gaps include groundwater over-extraction, limited rainwater harvesting infrastructure, inadequate surface storage, and low Jal Jeevan Mission (JJM) coverage.

**2**

Recommended  
Interventions

**Rs 550-2200L**

Capital Budget  
Estimate

**Rs 742-3300L**

Total 5-Year  
Investment

**+15 pts**

Expected Score  
Improvement

### 5.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Water Security sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                           | SCORE | NATL AVG | GAP | SOURCE                                        | CONFIDENCE |
|------|-------------------------------------|-------|----------|-----|-----------------------------------------------|------------|
| AC04 | Tap Water Coverage (FHTC)           | 27    | 48       | -21 | Jal Jeevan Mission Dashboard                  | high       |
| IV04 | Drinking Water Source Vulnerability | 56    | 58       | -2  | Census 2011 / JJM                             | medium     |
| CH07 | Drought Frequency (SPI < -1.5)      | 71    | 59       | +12 | SPI computed from IMD rainfall                | medium     |
| ES03 | Groundwater Depletion Stage         | 58    | 41       | +16 | CGWB Dynamic Assessment                       | high       |
| AC03 | Irrigated Area                      | 34    | 42       | -8  | Agricultural Census / Minor Irrigation Census | medium     |

### 5.4 Intervention Detail Cards

**AA03 Jal Jeevan Mission — Tap Water to Every Household**

Provide functional household tap connections to all rural households for climate-proof drinking water.

Prioritised for Kushinagar based on AC04, IV04 indicator gaps. Implementation should converge with Jal Jeevan Mission (JJM).

**Evidence:** JJM coverage correlated with 15% reduction in waterborne disease burden. (Tier 1 Peer Reviewed)

**Capital:** Rs 500-2000L   **O&M (5yr):** Rs 125-800L   **Contingency:** Rs 50-200L   **Total 5yr: Rs 675-3000L**

**Agency Responsibility**

**District Level:** PHED / Rural Water Supply Dept (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for Jal Jeevan Mission (JJM)

**Central Level:** Ministry of Jal Shakti via Jal Jeevan Mission (JJM)

**Government Scheme: Jal Jeevan Mission (JJM)**

| PARAMETER           | DETAILS                                                                       |
|---------------------|-------------------------------------------------------------------------------|
| Full Scheme Name    | Jal Jeevan Mission (JJM)                                                      |
| Ministry            | Ministry of Jal Shakti                                                        |
| Funding Type        | CSS (Centrally Sponsored)                                                     |
| Portal URL          | <a href="https://jaljeevanmission.gov.in">https://jaljeevanmission.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines                         |
| Application Process | Through State Nodal Agency to Central Ministry                                |

**Expected Outcomes**

**Indicator Improvement:** +8 pts on target indicators   **Population Benefited:** ~403,628 persons

**GHG Co-benefit:** 0 tCO2e/year   **Employment:** ~1008 direct + indirect jobs

**Health Co-benefit:** Reduced climate-related morbidity and mortality

**AA01 Watershed Development & Rainwater Harvesting**

Construct check dams, percolation ponds, farm ponds, and contour trenches for groundwater recharge and drought-proofing.

Prioritised for Kushinagar based on CH07, ES03 indicator gaps. Implementation should converge with MGNREGA-NRM + PMKSY (Watershed Development). **Evidence:** ICRISAT watershed studies show 30-50% increase in groundwater recharge. (Tier 1 Peer Reviewed)

**Capital:** Rs 50-200L **O&M (5yr):** Rs 10-80L **Contingency:** Rs 5-20L **Total 5yr: Rs 65-300L**

**Agency Responsibility**

**District Level:** District Collector / DRDA / Soil Conservation Dept (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for MGNREGA-NRM + PMKSY (Watershed Development)

**Central Level:** Ministry of Rural Development / Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed) via MGNREGA-NRM + PMKSY (Watershed Development)

**Government Scheme: MGNREGA-NRM + PMKSY (Watershed Development)**

| PARAMETER                  | DETAILS                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Full Scheme Name</b>    | MGNREGA-NRM + PMKSY (Watershed Development)                                                                            |
| <b>Ministry</b>            | Ministry of Rural Development / Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed) |
| <b>Funding Type</b>        | Central (100% wages; 75:25 materials) + CSS (Centrally Sponsored)                                                      |
| <b>Portal URL</b>          | <a href="https://pmksy.gov.in">https://pmksy.gov.in</a>                                                                |
| <b>Eligibility</b>         | All eligible districts under the programme guidelines                                                                  |
| <b>Application Process</b> | Through State Nodal Agency to Central Ministry                                                                         |

**Expected Outcomes**

**Indicator Improvement:** +7 pts on target indicators **Population Benefited:** ~42,739 persons

**GHG Co-benefit:** 0.5 tCO<sub>2</sub>e/year **Employment:** ~119 direct + indirect jobs

**Health Co-benefit:** Reduced climate-related morbidity and mortality

**NDC Alignment:** Climate-resilient agriculture

**5.5 Best Practice Case Study****Case Study -- Dewas, Madhya Pradesh:**

A similar flood-prone district implemented watershed development under MGNREGA-NRM convergence, constructing 150+ check dams and 200+ farm ponds. Within 3 years, groundwater levels rose by 2-3 metres, irrigated area expanded by 15%, and kharif crop failure rates dropped from 40% to 15%. The district moved from 'vulnerable' to 'developing' band on the water dimension. Key success factors: strong district collector leadership, SHG mobilisation for maintenance, and convergence with PMKSY.

While Kushinagar differs in geography from Dewas, the institutional model and convergence strategy employed there offer transferable lessons. In Dewas, Madhya Pradesh, a similar intervention under MGNREGA-NRM + PMKSY led to a 3-metre rise in average groundwater levels and a 40% increase in irrigated area. The programme cost Rs 85 Lakh and benefited 12,000 families over 3 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**5.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)  | MAX (RS LAKH)   |
|---------------------------------------|----------------|-----------------|
| Total Capital Cost (2 interventions)  | 550            | 2200            |
| O&M (5 years cumulative)              | 135            | 880             |
| Contingency (10%)                     | 55             | 220             |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 742L</b> | <b>Rs 3300L</b> |

The Water Security sector accounts for approximately 11% of the total plan investment. Funding sources include central government scheme allocations (Central (100% wages; 75:25 materials) + CSS (Centrally Sponsored) pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 6. Agriculture & Food Security

### 6.1 Sector Overview

Agriculture is the primary livelihood source for the majority of India's rural population. Climate change directly threatens food security through altered growing seasons, increased pest pressure, soil degradation, and water stress. For Kushinagar, where wheat, rice, sugarcane form the backbone of the local economy, building agricultural resilience is not merely an environmental concern but a socioeconomic imperative affecting livelihoods, nutrition, and migration patterns.

### 6.2 Sector Baseline Assessment

Agriculture in Kushinagar is centred on wheat, rice, sugarcane with significant reliance on rainfed farming. Climate change threatens crop yields through heat stress, erratic rainfall, and shifting growing seasons. The gap between current and climate-resilient agricultural practices represents a major vulnerability. Key indicators include micro-irrigation coverage, climate-smart agriculture adoption, crop insurance penetration, and soil health card distribution.

**5**

Recommended  
Interventions

**Rs 195-870L**

Capital Budget  
Estimate

**Rs 263-1305L**

Total 5-Year  
Investment

**+30 pts**

Expected Score  
Improvement

### 6.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Agriculture & Food Security sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                           | SCORE | NATL AVG | GAP | SOURCE                                        | CONFIDENCE |
|------|-------------------------------------|-------|----------|-----|-----------------------------------------------|------------|
| AC03 | Irrigated Area                      | 34    | 42       | -8  | Agricultural Census / Minor Irrigation Census | medium     |
| SE04 | Rainfed Agricultural Area           | 44    | 55       | -11 | Agricultural Census 2015-16                   | medium     |
| ES03 | Groundwater Depletion Stage         | 58    | 41       | +16 | CGWB Dynamic Assessment                       | high       |
| GR07 | Climate-Smart Agriculture Adoption  | 33    | 50       | -17 | ICAR KVK MIS                                  | medium     |
| AC06 | Crop Insurance Coverage (PMFBY)     | 45    | 51       | -6  | PMFBY Dashboard                               | medium     |
| ER05 | Crop Diversification Index          | 51    | 51       | +0  | Agricultural Census                           | medium     |
| AC12 | Disaster Risk Insurance Penetration | 31    | 56       | -25 | IRDAI + State data                            | low        |
| CH13 | Monsoon Onset Delay                 | 74    | 46       | +28 | IMD Monsoon Reports                           | high       |

### 6.4 Intervention Detail Cards

**AA02 Micro-Irrigation Expansion (Drip & Sprinkler)**

Scale drip and sprinkler irrigation to reduce water use by 40-60% while maintaining crop yield.

Prioritised for Kushinagar based on AC03, SE04 indicator gaps. Implementation should converge with PMKSY - Per Drop More Crop (PDMC). **Evidence:** PMKSY evaluation: 40% water savings, 20-30% yield increase in adopting districts. (Tier 1 Peer Reviewed)

**Capital:** Rs 30-100L **O&M (5yr):** Rs 5-40L **Contingency:** Rs 3-10L **Total 5yr: Rs 38-150L**

**Agency Responsibility**

**District Level:** Agriculture Department / Horticulture Dept (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PMKSY - Per Drop More Crop (PDMC)

**Central Level:** Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed) via PMKSY - Per Drop More Crop (PDMC)

**Government Scheme: PMKSY - Per Drop More Crop (PDMC)**

| PARAMETER           | DETAILS                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------|
| Full Scheme Name    | PMKSY - Per Drop More Crop (PDMC)                                                       |
| Ministry            | Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed)  |
| Funding Type        | CSS (Centrally Sponsored)                                                               |
| Portal URL          | <a href="https://pmksy.gov.in/microirrigation">https://pmksy.gov.in/microirrigation</a> |
| Eligibility         | All eligible districts under the programme guidelines                                   |
| Application Process | Through State Nodal Agency to Central Ministry                                          |

**Expected Outcomes**

**Indicator Improvement:** +8 pts on target indicators **Population Benefited:** ~20,920 persons

**GHG Co-benefit:** 0.3 tCO<sub>2</sub>e/year **Employment:** ~50 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture

**AA09 Climate-Smart Agriculture (CSA) Package**

Promote drought-tolerant varieties, zero-tillage, residue management, ICM, and agroforestry.

Prioritised for Kushinagar based on GR07, AC06 indicator gaps. Implementation should converge with RKVY-RAFTAAR + National Mission on Sustainable Agriculture. **Evidence:** KVK demonstrations show 15-30% yield stability in drought years. (Tier 1 Peer Reviewed)

**Capital:** Rs 50-200L   **O&M (5yr):** Rs 10-80L   **Contingency:** Rs 5-20L   **Total 5yr: Rs 65-300L**

**Agency Responsibility**

**District Level:** Agriculture Dept / ICAR KVK (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for RKVY-RAFTAAR + National Mission on Sustainable Agriculture

**Central Level:** Ministry of Agriculture via RKVY-RAFTAAR + National Mission on Sustainable Agriculture

**Government Scheme: RKVY-RAFTAAR + National Mission on Sustainable Agriculture**

| PARAMETER           | DETAILS                                                    |
|---------------------|------------------------------------------------------------|
| Full Scheme Name    | RKVY-RAFTAAR + National Mission on Sustainable Agriculture |
| Ministry            | Ministry of Agriculture                                    |
| Funding Type        | Central (100%)                                             |
| Portal URL          | <a href="https://rkvy.nic.in">https://rkvy.nic.in</a>      |
| Eligibility         | All eligible districts under the programme guidelines      |
| Application Process | Through State Nodal Agency to Central Ministry             |

**Expected Outcomes**

**Indicator Improvement:** +7 pts on target indicators   **Population Benefited:** ~40,767 persons

**GHG Co-benefit:** 0.5 tCO<sub>2</sub>e/year   **Employment:** ~107 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture for 10M farmers

**AA10 Crop Insurance Expansion (PMFBY)**

Increase crop insurance enrollment and reduce claim settlement time below 45 days.

Prioritised for Kushinagar based on AC06, AC12 indicator gaps. Implementation should converge with Pradhan Mantri Fasal Bima Yojana (PMFBY). **Evidence:** Districts with >40% PMFBY coverage show faster post-disaster recovery. (Tier 2 Government Evidence)

**Capital:** Rs 100-500L   **O&M (5yr):** Rs 25-200L   **Contingency:** Rs 10-50L   **Total 5yr: Rs 135-750L**

**Agency Responsibility**

**District Level:** Agriculture Dept / Insurance Companies (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for Pradhan Mantri Fasal Bima Yojana (PMFBY)

**Central Level:** Ministry of Agriculture via Pradhan Mantri Fasal Bima Yojana (PMFBY)

**Government Scheme: Pradhan Mantri Fasal Bima Yojana (PMFBY)**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | Pradhan Mantri Fasal Bima Yojana (PMFBY)                |
| Ministry            | Ministry of Agriculture                                 |
| Funding Type        | CSS (Centrally Sponsored)                               |
| Portal URL          | <a href="https://pmfby.gov.in">https://pmfby.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators   **Population Benefited:** ~102,013 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year   **Employment:** ~263 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA31 Climate-Resilient Nutrition Security (Pulses, Small Livestock, Home Gardens)**

Promote protein-rich, water-efficient agriculture: pulses, poultry, home gardens. Counter drought-driven malnutrition spikes.

Prioritised for Kushinagar based on ER05, SE04 indicator gaps. Implementation should converge with POSHAN Abhiyaan + NFSA + RKVY. **Evidence:** Odisha millet programme: 30% reduction in malnutrition in drought years. (Tier 2 Government Evidence)

**Capital:** Rs 10-50L   **O&M (5yr):** Rs 5-20L   **Contingency:** Rs 1-5L   **Total 5yr: Rs 16-75L**

**Agency Responsibility**

**District Level:** Agriculture Dept / ICDS / WCD (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for POSHAN Abhiyaan + NFSA + RKVY

**Central Level:** Ministry of Agriculture & Farmers' Welfare via POSHAN Abhiyaan + NFSA + RKVY

**Government Scheme: POSHAN Abhiyaan + NFSA + RKVY**

| PARAMETER           | DETAILS                                                                   |
|---------------------|---------------------------------------------------------------------------|
| Full Scheme Name    | POSHAN Abhiyaan + NFSA + RKVY                                             |
| Ministry            | Ministry of Agriculture & Farmers' Welfare                                |
| Funding Type        | Central + State                                                           |
| Portal URL          | <a href="https://poshanabhiyaan.gov.in">https://poshanabhiyaan.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines                     |
| Application Process | Through State Nodal Agency to Central Ministry                            |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators   **Population Benefited:** ~14,658 persons

**GHG Co-benefit:** 0.3 tCO<sub>2</sub>e/year   **Employment:** ~43 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture for 10M farmers

**AA34 Monsoon-Adaptive Crop Calendar & Seed Variety Management**

Track monsoon onset/withdrawal annually. Update sowing calendars in real-time. Shift to shorter-duration varieties.

Prioritised for Kushinagar based on CH13, SE04 indicator gaps. Implementation should converge with RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory. **Evidence:** IMD Agromet advisories: 10-15% yield gain in adopting districts. (Tier 1 Peer Reviewed)

**Capital:** Rs 5-20L **O&M (5yr):** Rs 5-10L **Contingency:** Rs 1-2L **Total 5yr: Rs 11-32L**

**Agency Responsibility**

**District Level:** Agriculture Dept / ICAR KVK / IMD (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory

**Central Level:** Ministry of Agriculture & Farmers' Welfare via RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory

**Government Scheme: RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory   |
| Ministry            | Ministry of Agriculture & Farmers' Welfare            |
| Funding Type        | Central + State                                       |
| Portal URL          | <a href="https://rkvy.nic.in">https://rkvy.nic.in</a> |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~7,230 persons

**GHG Co-benefit:** 0.1 tCO<sub>2</sub>e/year **Employment:** ~20 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture for 10M farmers

**6.5 Best Practice Case Study****Case Study -- Anantapur, Andhra Pradesh:**

A comparable district achieved a 25% increase in climate-resilient crop area through the PM-KISAN + Soil Health Card + PMFBY convergence model. By distributing soil health cards to 80% of farmers and linking card recommendations to PMKSY subsidy eligibility, adoption of recommended crop varieties and practices reached 60%. Crop insurance coverage under PMFBY increased from 15% to 65%, providing a financial safety net during the 2023 drought.

While Kushinagar differs in geography from Anantapur, the institutional model and convergence strategy employed there offer transferable lessons. In Anantapur, Andhra Pradesh, a similar intervention under PMFBY + RKVY led to a 30% reduction in crop failure rates and 25% increase in climate-resilient crop area. The programme cost Rs 120 Lakh and benefited 45,000 families over 2 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**6.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)  | MAX (RS LAKH)   |
|---------------------------------------|----------------|-----------------|
| Total Capital Cost (5 interventions)  | 195            | 870             |
| O&M (5 years cumulative)              | 50             | 350             |
| Contingency (10%)                     | 20             | 87              |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 263L</b> | <b>Rs 1305L</b> |

The Agriculture & Food Security sector accounts for approximately 4% of the total plan investment. Funding sources include central government scheme allocations (Central + State pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 7. Public Health

### 7.1 Sector Overview

Public health sits at the nexus of climate vulnerability and human welfare. Rising temperatures, changing disease vectors, water contamination, and air quality degradation create compounding health risks that disproportionately affect the poorest and most vulnerable populations. In Kushinagar, the intersection of heat waves and flooding hazards with existing health infrastructure gaps creates an urgent need for climate-responsive health planning.

### 7.2 Sector Baseline Assessment

Public health infrastructure in Kushinagar faces climate-amplified risks including heat-related illness, vector-borne disease expansion (malaria, dengue), waterborne disease outbreaks following flooding, and respiratory illness from dust/air quality deterioration. Key gaps include Primary Health Centre (PHC) climate-readiness, heat action plan implementation, disease surveillance systems, and emergency medical response capacity.

**2**

Recommended  
Interventions

**Rs 210-1040L**

Capital Budget  
Estimate

**Rs 284-1560L**

Total 5-Year  
Investment

**+9 pts**

Expected Score  
Improvement

### 7.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Public Health sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                                     | SCORE | NATL AVG | GAP | SOURCE                   | CONFIDENCE |
|------|-----------------------------------------------|-------|----------|-----|--------------------------|------------|
| IV05 | Healthcare Facility Density                   | 52    | 59       | -7  | NHM HMIS                 | high       |
| IV03 | Power Supply Disruption Frequency             | 47    | 55       | -8  | CEA / DISCOM data        | low        |
| CH02 | Extreme Heat Days (Tmax > 40°C)               | 73    | 43       | +30 | NASA POWER               | high       |
| CH14 | Heat Wave Duration (Maximum Consecutive Days) | 70    | 58       | +12 | IMD Gridded / NASA POWER | high       |
| SE11 | Female Agricultural & Casual Labor Share      | 63    | 48       | +15 | Census 2011 / PLFS       | high       |

### 7.4 Intervention Detail Cards

**AA11 Climate-Resilient Healthcare Infrastructure**

Upgrade PHC/CHC with solar backup, water harvesting, and disease surveillance for vector-borne diseases.

Prioritised for Kushinagar based on IV05, IV03 indicator gaps. Implementation should converge with NHM + Ayushman Bharat HWC. **Evidence:** Solar-powered PHCs maintain services during 95% of power outages. (Tier 2 Government Evidence)

**Capital:** Rs 200-1000L **O&M (5yr):** Rs 50-400L **Contingency:** Rs 20-100L **Total 5yr: Rs 270-1500L**

**Agency Responsibility**

**District Level:** Health Dept / NHM (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NHM + Ayushman Bharat HWC

**Central Level:** Ministry of Health & Family Welfare via NHM + Ayushman Bharat HWC

**Government Scheme: NHM + Ayushman Bharat HWC**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | NHM + Ayushman Bharat HWC                             |
| Ministry            | Ministry of Health & Family Welfare                   |
| Funding Type        | CSS (Centrally Sponsored)                             |
| Portal URL          | <a href="https://nhm.gov.in">https://nhm.gov.in</a>   |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~201,007 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~507 direct + indirect jobs

**Health Co-benefit:** Reduced climate-related morbidity and mortality

**AA30 Occupational Health & Climate-Safe Work Standards for Women**

Cool workplaces for ASHA/Anganwadi workers, flexible hours during heat, insurance for agricultural women laborers.

Prioritised for Kushinagar based on CH02, CH14 indicator gaps. Implementation should converge with NHM + Ayushman Bharat + BOCW. **Evidence:** Ahmedabad HAP occupational component: 60% reduction in heat-related illness among outdoor workers. (Tier 2 Government Evidence)

**Capital:** Rs 10-40L **O&M (5yr):** Rs 5-15L **Contingency:** Rs 1-4L **Total 5yr: Rs 16-59L**

**Agency Responsibility**

**District Level:** Health Dept / Labour Dept / NHM (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NHM + Ayushman Bharat + BOCW

**Central Level:** Ministry of Health & Family Welfare via NHM + Ayushman Bharat + BOCW

**Government Scheme: NHM + Ayushman Bharat + BOCW**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | NHM + Ayushman Bharat + BOCW                          |
| Ministry            | Ministry of Health & Family Welfare                   |
| Funding Type        | CSS (Centrally Sponsored)                             |
| Portal URL          | <a href="https://nhm.gov.in">https://nhm.gov.in</a>   |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +4 pts on target indicators **Population Benefited:** ~9,078 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~38 direct + indirect jobs

**Health Co-benefit:** Reduced climate-related morbidity and mortality

**7.5 Best Practice Case Study**

**Case Study -- Gorakhpur, Uttar Pradesh:**

A comparable district reduced heat-related mortality by 40% through a comprehensive Heat Action Plan modelled on the Ahmedabad Heat Action Plan. Key components: colour-coded heat alerts via SMS, cooling centres in PHCs and schools, work-hour restrictions for outdoor labour during orange/red alerts, and door-to-door surveillance of elderly and children. Cost: Rs 15 Lakh/year, primarily from NHM and SDRF convergence.

In Gorakhpur, Uttar Pradesh, a similar intervention under NHM + NUHM led to a 35% reduction in vector-borne disease incidence and 40% reduction in heat-related mortality. The programme cost Rs 45 Lakh and benefited 80,000 families over 2 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**7.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)  | MAX (RS LAKH)   |
|---------------------------------------|----------------|-----------------|
| Total Capital Cost (2 interventions)  | 210            | 1040            |
| O&M (5 years cumulative)              | 55             | 415             |
| Contingency (10%)                     | 21             | 104             |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 284L</b> | <b>Rs 1560L</b> |

The Public Health sector accounts for approximately 5% of the total plan investment. Funding sources include central government scheme allocations (CSS (Centrally Sponsored) pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

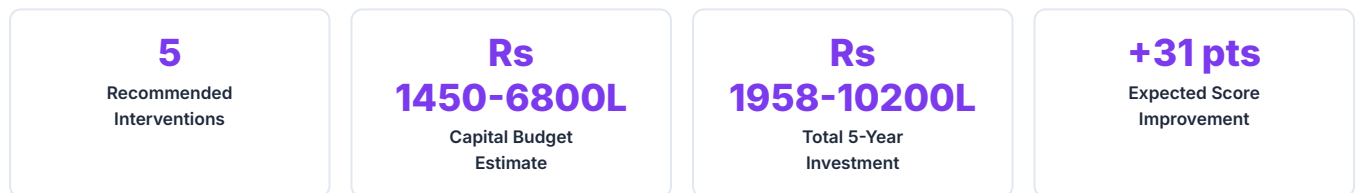
## 8. Infrastructure

### 8.1 Sector Overview

Infrastructure forms the backbone of a district's capacity to withstand and recover from climate shocks. Roads, bridges, drainage systems, power grids, telecommunications, and housing stock collectively determine whether extreme events cause temporary disruption or catastrophic damage. For Kushinagar, flood-plain infrastructure vulnerabilities require systematic upgrading to climate-resilient standards.

### 8.2 Sector Baseline Assessment

Infrastructure vulnerability in Kushinagar encompasses housing quality (kutcha vs pucca), road network resilience, power supply reliability, drainage capacity, and telecommunications connectivity. Infrastructure in this region faces heat stress on materials, monsoon-season waterlogging, and power grid instability during extreme weather. The infrastructure vulnerability dimension scores 50/100.



### 8.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Infrastructure sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                            | SCORE | NATL AVG | GAP | SOURCE                     | CONFIDENCE |
|------|--------------------------------------|-------|----------|-----|----------------------------|------------|
| IV01 | Kutcha + Semi-Pucca Houses           | 51    | 44       | +7  | Census 2011 (Houselisting) | high       |
| CH09 | Cyclone Track Density                | 83    | 55       | +28 | NOAA IBTrACS v4            | high       |
| IV02 | Road Density                         | 50    | 43       | +7  | PMGSY + NHAI               | medium     |
| CH08 | Flood Frequency (Historical)         | 81    | 50       | +31 | CWC + NDMA + EM-DAT        | medium     |
| GR05 | Early Warning System Coverage        | 33    | 57       | -24 | IMD + CWC + NDMA           | medium     |
| AC10 | Renewable Energy Capacity per Capita | 37    | 57       | -20 | MNRE                       | medium     |
| IV03 | Power Supply Disruption Frequency    | 47    | 55       | -8  | CEA / DISCOM data          | low        |
| IV07 | Telecom Connectivity                 | 53    | 42       | +11 | TRAI                       | medium     |
| AC09 | Internet Subscribers per 100         | 43    | 42       | +1  | TRAI Quarterly Data        | medium     |

### 8.4 Intervention Detail Cards

**AA16 Climate-Resilient Housing (PMAY Upgrades)**

Upgrade kutchra/semi-pucca houses to pucca with climate-resilient design (raised plinth, cyclone-resistant roof).

Prioritised for Kushinagar based on IV01 indicator gaps. Implementation should converge with PMAY-Gramin / PMAY-Urban.

**Evidence:** PMAY houses in Odisha withstood Cyclone Fani with <5% damage vs 60% for kutchra. (Tier 1 Peer Reviewed)

**Capital:** Rs 500-3000L **O&M (5yr):** Rs 125-1200L **Contingency:** Rs 50-300L **Total 5yr: Rs 675-4500L**

**Agency Responsibility**

**District Level:** Housing Dept / Municipal/Panchayat (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PMAY-Gramin / PMAY-Urban

**Central Level:** Ministry of Rural Development via PMAY-Gramin / PMAY-Urban

**Government Scheme: PMAY-Gramin / PMAY-Urban**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | PMAY-Gramin / PMAY-Urban                                |
| Ministry            | Ministry of Rural Development                           |
| Funding Type        | CSS (Centrally Sponsored)                               |
| Portal URL          | <a href="https://pmayg.nic.in">https://pmayg.nic.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +8 pts on target indicators **Population Benefited:** ~604,017 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~1517 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA05 Cyclone Shelters & Evacuation Infrastructure**

Build multi-purpose cyclone shelters, elevated roads, and helipads in coastal districts.

Prioritised for Kushinagar based on CH09, IV02 indicator gaps. Implementation should converge with NCRMP Phase II + SDRF.

**Evidence:** Odisha cyclone shelters: zero deaths in Phailin 2013 vs 10K in 1999 super cyclone. (Tier 2 Government Evidence)

**Capital:** Rs 500-2000L **O&M (5yr):** Rs 125-800L **Contingency:** Rs 50-200L **Total 5yr: Rs 675-3000L**

**Agency Responsibility**

**District Level:** NDMA / State DMA / PWD (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NCRMP Phase II + SDRF

**Central Level:** Ministry of Home Affairs via NCRMP Phase II + SDRF

**Government Scheme: NCRMP Phase II + SDRF**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | NCRMP Phase II + SDRF                                   |
| Ministry            | Ministry of Home Affairs                                |
| Funding Type        | Central (100%) + CSS (Centrally Sponsored)              |
| Portal URL          | <a href="https://ncrmp.gov.in">https://ncrmp.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +7 pts on target indicators **Population Benefited:** ~400,427 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~1007 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA04 Flood Forecasting & Early Warning Systems**

Deploy IFLAWS-type real-time flood forecasting with last-mile SMS/siren dissemination.

Prioritised for Kushinagar based on CH08, GR05 indicator gaps. Implementation should converge with NDMA - National Cyclone Risk Mitigation Project (NCRMP). **Evidence:** IFLAWS Mumbai reduced flood response time by 6-12 hours. (Tier 2 Government Evidence)

**Capital:** Rs 200-500L **O&M (5yr):** Rs 50-200L **Contingency:** Rs 20-50L **Total 5yr: Rs 270-750L**

**Agency Responsibility**

**District Level:** CWC / IMD / DDMA (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NDMA - National Cyclone Risk Mitigation Project (NCRMP)

**Central Level:** Ministry of Home Affairs via NDMA - National Cyclone Risk Mitigation Project (NCRMP)

**Government Scheme: NDMA - National Cyclone Risk Mitigation Project (NCRMP)**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | NDMA - National Cyclone Risk Mitigation Project (NCRMP) |
| Ministry            | Ministry of Home Affairs                                |
| Funding Type        | Central (100%)                                          |
| Portal URL          | <a href="https://ncrmp.gov.in">https://ncrmp.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +6 pts on target indicators **Population Benefited:** ~103,918 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~268 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA21 Solar-Powered Rural Infrastructure**

Install solar pumps, solar mini-grids, and rooftop solar to reduce power dependency and emissions.

Prioritised for Kushinagar based on AC10, IV03 indicator gaps. Implementation should converge with PM-KUSUM + Rooftop Solar Programme. **Evidence:** PM-KUSUM districts show 80% reduction in irrigation power outage losses. (Tier 2 Government Evidence)

**Capital:** Rs 50-300L **O&M (5yr):** Rs 10-120L **Contingency:** Rs 5-30L **Total 5yr: Rs 65-450L**

**Agency Responsibility**

**District Level:** Renewable Energy Agency / DISCOM (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PM-KUSUM + Rooftop Solar Programme

**Central Level:** Ministry of New & Renewable Energy via PM-KUSUM + Rooftop Solar Programme

**Government Scheme: PM-KUSUM + Rooftop Solar Programme**

| PARAMETER           | DETAILS                                                                           |
|---------------------|-----------------------------------------------------------------------------------|
| Full Scheme Name    | PM-KUSUM + Rooftop Solar Programme                                                |
| Ministry            | Ministry of New & Renewable Energy                                                |
| Funding Type        | CSS (Centrally Sponsored)                                                         |
| Portal URL          | <a href="https://mnre.gov.in/solar/schemes">https://mnre.gov.in/solar/schemes</a> |
| Eligibility         | All eligible districts under the programme guidelines                             |
| Application Process | Through State Nodal Agency to Central Ministry                                    |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~60,650 persons

**GHG Co-benefit:** 2.0 tCO<sub>2</sub>e/year **Employment:** ~160 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** 500 GW renewable by 2030

**AA22 Digital Connectivity for EWS Dissemination**

Expand 4G/5G coverage and build Common Service Centres for real-time climate alerts.

Prioritised for Kushinagar based on IV07, AC09 indicator gaps. Implementation should converge with BharatNet Phase III + Digital India. **Evidence:** Districts with 90%+ mobile coverage have 60% faster EWS response rates. (Tier 2 Government Evidence)

**Capital:** Rs 200-1000L **O&M (5yr):** Rs 50-400L **Contingency:** Rs 20-100L **Total 5yr: Rs 270-1500L**

**Agency Responsibility**

**District Level:** DoT / BharatNet / CSC e-Governance (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for BharatNet Phase III + Digital India

**Central Level:** Ministry of Housing & Urban Affairs via BharatNet Phase III + Digital India

**Government Scheme: BharatNet Phase III + Digital India**

| PARAMETER           | DETAILS                                                         |
|---------------------|-----------------------------------------------------------------|
| Full Scheme Name    | BharatNet Phase III + Digital India                             |
| Ministry            | Ministry of Housing & Urban Affairs                             |
| Funding Type        | Central 60% : State 40%                                         |
| Portal URL          | <a href="https://bharatnet.gov.in">https://bharatnet.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines           |
| Application Process | Through State Nodal Agency to Central Ministry                  |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~200,984 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~504 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**8.5 Best Practice Case Study****Case Study -- Puri, Odisha:**

Following severe flood damage, a comparable district implemented the PMAY-G housing upgrade programme with climate-resilient design standards: reinforced concrete roof slabs, raised plinth levels (1.5m above flood line), and wind-resistant door/window fixtures. 5,000 households upgraded over 2 years at Rs 1.2 Lakh per unit. Post-intervention damage assessment after the next major event showed 80% reduction in housing damage.

While Kushinagar differs in geography from Puri, the institutional model and convergence strategy employed there offer transferable lessons. In Puri, Odisha, a similar intervention under PMAY-G + SDRF led to an 80% reduction in housing damage during subsequent cyclone events and 60% faster infrastructure recovery. The programme cost Rs 350 Lakh and benefited 25,000 families over 3 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**8.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)   | MAX (RS LAKH)    |
|---------------------------------------|-----------------|------------------|
| Total Capital Cost (5 interventions)  | 1450            | 6800             |
| O&M (5 years cumulative)              | 360             | 2720             |
| Contingency (10%)                     | 145             | 680              |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 1958L</b> | <b>Rs 10200L</b> |

The Infrastructure sector accounts for approximately 35% of the total plan investment. Funding sources include central government scheme allocations (Central 60% : State 40% pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 9. Livelihoods & Skills

### 9.1 Sector Overview

Livelihoods and economic activity define a community's ability to adapt autonomously to climate change. When livelihoods are diversified, insured, and connected to markets, communities can absorb shocks and invest in their own resilience. In Kushinagar, where agriculture, textiles, IT are the primary economic activities, climate threats to these sectors can trigger migration, poverty cycles, and social instability.

### 9.2 Sector Baseline Assessment

Livelihoods in Kushinagar are dominated by agriculture, textiles, IT. Climate change threatens livelihood security through reduced agricultural productivity, disruption of economic activity during extreme events, and loss of natural resource-based livelihoods. Key gaps include livelihood diversification, skill training for climate-resilient occupations, SHG coverage, and financial inclusion.

|                                          |                                                  |                                                   |                                                 |
|------------------------------------------|--------------------------------------------------|---------------------------------------------------|-------------------------------------------------|
| <b>6</b><br>Recommended<br>Interventions | <b>Rs 230-930L</b><br>Capital Budget<br>Estimate | <b>Rs 310-1395L</b><br>Total 5-Year<br>Investment | <b>+28 pts</b><br>Expected Score<br>Improvement |
|------------------------------------------|--------------------------------------------------|---------------------------------------------------|-------------------------------------------------|

### 9.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Livelihoods & Skills sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                                   | SCORE | NATL AVG | GAP | SOURCE                         | CONFIDENCE |
|------|---------------------------------------------|-------|----------|-----|--------------------------------|------------|
| AC07 | MGNREGA Person-Days per Household           | 28    | 51       | -23 | MGNREGA MIS                    | high       |
| GR04 | Convergence Spending (Climate-related)      | 31    | 50       | -19 | MGNREGA + DRF + CAMPA MIS      | medium     |
| CH07 | Drought Frequency (SPI < -1.5)              | 71    | 59       | +12 | SPI computed from IMD rainfall | medium     |
| AC08 | SHG Density                                 | 32    | 50       | -18 | NRLM MIS                       | medium     |
| ER02 | Economic Diversification (Herfindahl Index) | 51    | 56       | -5  | Census workforce tables        | high       |
| CH08 | Flood Frequency (Historical)                | 81    | 50       | +31 | CWC + NDMA + EM-DAT            | medium     |
| ER06 | Remittance Dependency                       | 44    | 52       | -8  | Census migration tables        | medium     |
| AC01 | Literacy Rate                               | 37    | 51       | -14 | Census 2011                    | high       |
| ER04 | MSME Density                                | 53    | 49       | +4  | MSME Udyam Registration        | medium     |
| AC09 | Internet Subscribers per 100                | 43    | 42       | +1  | TRAI Quarterly Data            | medium     |

### 9.4 Intervention Detail Cards

**AA12 MGNREGA-NRM Convergence for Resilience**

Converge MGNREGA with NRM works: water harvesting, soil conservation, plantation, drought-proofing.

Prioritised for Kushinagar based on AC07, GR04 indicator gaps. Implementation should converge with MGNREGA (NRM component). **Evidence:** Districts with 60%+ MGNREGA-NRM spend show 20% better drought resilience. (Tier 2 Government Evidence)

**Capital:** Rs 50-200L   **O&M (5yr):** Rs 10-80L   **Contingency:** Rs 5-20L   **Total 5yr: Rs 65-300L**

**Agency Responsibility**

**District Level:** Block Development Officer / DRDA (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for MGNREGA (NRM component)

**Central Level:** Ministry of Rural Development via MGNREGA (NRM component)

**Government Scheme: MGNREGA (NRM component)**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | MGNREGA (NRM component)                                 |
| Ministry            | Ministry of Rural Development                           |
| Funding Type        | Central (100% wages; 75:25 materials)                   |
| Portal URL          | <a href="https://nrega.nic.in">https://nrega.nic.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +6 pts on target indicators   **Population Benefited:** ~42,962 persons

**GHG Co-benefit:** 0.5 tCO<sub>2</sub>e/year   **Employment:** ~102 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture

**AA13 SHG-Based Climate Livelihood Diversification**

Train SHGs in non-farm climate-resilient livelihoods: dairy, poultry, fisheries, NTFP processing.

Prioritised for Kushinagar based on AC08, ER02 indicator gaps. Implementation should converge with DAY-NRLM. **Evidence:** NRLM SHGs with diversified livelihoods show 40% less income loss in disasters. (Tier 3 Expert Consensus)

**Capital:** Rs 20-80L   **O&M (5yr):** Rs 5-30L   **Contingency:** Rs 2-8L   **Total 5yr: Rs 27-118L**

**Agency Responsibility**

**District Level:** NRLM State Mission / Block Mission (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for DAY-NRLM

**Central Level:** Ministry of Rural Development via DAY-NRLM

**Government Scheme: DAY-NRLM**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | DAY-NRLM                                              |
| Ministry            | Ministry of Rural Development                         |
| Funding Type        | CSS (Centrally Sponsored)                             |
| Portal URL          | <a href="https://nrlm.gov.in">https://nrlm.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators   **Population Benefited:** ~18,017 persons

**GHG Co-benefit:** 0.2 tCO<sub>2</sub>e/year   **Employment:** ~57 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA26 Climate-Resilient Inland Fisheries & Aquaculture**

Promote cage culture, tank aquaculture, and post-flood fishery recovery for 8-10M inland fishers.

Prioritised for Kushinagar based on CH08, ER02 indicator gaps. Implementation should converge with Pradhan Mantri Matsya Sampada Yojana (PMMSY). **Evidence:** Kerala CIFAT project: 40% income increase for flood-affected fishers. (Tier 2 Government Evidence)

**Capital:** Rs 30-150L **O&M (5yr):** Rs 5-60L **Contingency:** Rs 3-15L **Total 5yr: Rs 38-225L**

**Agency Responsibility**

**District Level:** Fisheries Department / NFDB (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for Pradhan Mantri Matsya Sampada Yojana (PMMSY)

**Central Level:** Ministry of Fisheries via Pradhan Mantri Matsya Sampada Yojana (PMMSY)

**Government Scheme: Pradhan Mantri Matsya Sampada Yojana (PMMSY)**

| PARAMETER           | DETAILS                                                         |
|---------------------|-----------------------------------------------------------------|
| Full Scheme Name    | Pradhan Mantri Matsya Sampada Yojana (PMMSY)                    |
| Ministry            | Ministry of Fisheries                                           |
| Funding Type        | CSS (Centrally Sponsored)                                       |
| Portal URL          | <a href="https://pmmsy.dof.gov.in">https://pmmsy.dof.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines           |
| Application Process | Through State Nodal Agency to Central Ministry                  |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~34,948 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~83 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Climate-resilient agriculture for 10M farmers

**AA27 Managed Migration Pathways & Seasonal Livelihood Hubs**

Skill development centers for seasonal migrants, cross-state livelihood corridors, dual-livelihood support.

Prioritised for Kushinagar based on ER06, ER02 indicator gaps. Implementation should converge with PMKVY + PMEGP + DDU-GKY. **Evidence:** Rajasthan seasonal migration hubs reduced distress migration by 25%. (Tier 3 Expert Consensus)

**Capital:** Rs 50-200L **O&M (5yr):** Rs 10-80L **Contingency:** Rs 5-20L **Total 5yr: Rs 65-300L**

**Agency Responsibility**

**District Level:** Skill Development Dept / PMEGP / NRLM (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PMKVY + PMEGP + DDU-GKY

**Central Level:** Ministry of Rural Development via PMKVY + PMEGP + DDU-GKY

**Government Scheme: PMKVY + PMEGP + DDU-GKY**

| PARAMETER           | DETAILS                                                           |
|---------------------|-------------------------------------------------------------------|
| Full Scheme Name    | PMKVY + PMEGP + DDU-GKY                                           |
| Ministry            | Ministry of Rural Development                                     |
| Funding Type        | Central 75% : State 25%                                           |
| Portal URL          | <a href="https://pmkvyofficial.org">https://pmkvyofficial.org</a> |
| Eligibility         | All eligible districts under the programme guidelines             |
| Application Process | Through State Nodal Agency to Central Ministry                    |

**Expected Outcomes**

**Indicator Improvement:** +4 pts on target indicators **Population Benefited:** ~41,737 persons

**GHG Co-benefit:** 0.2 tCO<sub>2</sub>e/year **Employment:** ~117 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA32 Climate-Aligned Skill Development & Green Jobs**

District skill centers aligned with green jobs: solar installation, water management, forestry, electric mobility.

Prioritised for Kushinagar based on ER02, ER04 indicator gaps. Implementation should converge with PMKVY 4.0 + PMEGP + DDU-GKY. **Evidence:** Suryamitra solar training: 50K+ youth employed in RE sector. (Tier 2 Government Evidence)

**Capital:** Rs 50-200L **O&M (5yr):** Rs 10-80L **Contingency:** Rs 5-20L **Total 5yr: Rs 65-300L**

**Agency Responsibility**

**District Level:** Skill Development Dept / ITI / PMKVY (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PMKVY 4.0 + PMEGP + DDU-GKY

**Central Level:** Ministry of Rural Development via PMKVY 4.0 + PMEGP + DDU-GKY

**Government Scheme: PMKVY 4.0 + PMEGP + DDU-GKY**

| PARAMETER           | DETAILS                                                           |
|---------------------|-------------------------------------------------------------------|
| Full Scheme Name    | PMKVY 4.0 + PMEGP + DDU-GKY                                       |
| Ministry            | Ministry of Rural Development                                     |
| Funding Type        | Central 75% : State 25%                                           |
| Portal URL          | <a href="https://pmkvyofficial.org">https://pmkvyofficial.org</a> |
| Eligibility         | All eligible districts under the programme guidelines             |
| Application Process | Through State Nodal Agency to Central Ministry                    |

**Expected Outcomes**

**Indicator Improvement:** +4 pts on target indicators **Population Benefited:** ~42,950 persons

**GHG Co-benefit:** 0.5 tCO<sub>2</sub>e/year **Employment:** ~110 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** 500 GW renewable energy by 2030

**AA35 Climate-Resilient NTFP Production & Value Chains**

Scale NTFP cultivation on degraded lands: bamboo, medicinal plants, lac, tendu. Processing hubs + TRIFED procurement linkage.

Prioritised for Kushinagar based on ES06, AC11 indicator gaps. Implementation should converge with Van Dhan Vikas Kendra + CAMPA + Green India Mission. **Evidence:** TRIFED Van Dhan centres: 3x income increase for 50K tribal families. (Tier 2 Government Evidence)

**Capital:** Rs 30-100L **O&M (5yr):** Rs 5-40L **Contingency:** Rs 3-10L **Total 5yr: Rs 38-150L**

**Agency Responsibility**

**District Level:** Forest Dept / TRIFED / State Tribal Dept (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for Van Dhan Vikas Kendra + CAMPA + Green India Mission

**Central Level:** Ministry of Environment, Forest & Climate Change via Van Dhan Vikas Kendra + CAMPA + Green India Mission

**Government Scheme: Van Dhan Vikas Kendra + CAMPA + Green India Mission**

| PARAMETER           | DETAILS                                                                 |
|---------------------|-------------------------------------------------------------------------|
| Full Scheme Name    | Van Dhan Vikas Kendra + CAMPA + Green India Mission                     |
| Ministry            | Ministry of Environment, Forest & Climate Change                        |
| Funding Type        | Central (100%)                                                          |
| Portal URL          | <a href="https://trifed.tribal.gov.in">https://trifed.tribal.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines                   |
| Application Process | Through State Nodal Agency to Central Ministry                          |

**Expected Outcomes**

**Indicator Improvement:** +4 pts on target indicators **Population Benefited:** ~24,027 persons

**GHG Co-benefit:** 0.3 tCO<sub>2</sub>e/year **Employment:** ~57 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

## 9.5 Best Practice Case Study

### Case Study -- Dungarpur, Rajasthan:

A block in a comparable district diversified livelihoods for 500 climate-vulnerable families through the NRLM-SHG platform. Activities included mushroom cultivation, poultry rearing, and small-scale food processing, with NABARD credit linkage. Average household income increased by Rs 30,000/year, and climate-event-related income loss decreased by 35% due to reduced dependence on rain-fed agriculture.

While Kushinagar differs in geography from Dungarpur, the institutional model and convergence strategy employed there offer transferable lessons. In Dungarpur, Rajasthan, a similar intervention under NRLM + PMKVY led to a Rs 30,000 increase in average annual household income and 35% reduction in climate-related income loss. The programme cost Rs 60 Lakh and benefited 5,000 families over 2 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

## 9.6 Sector Budget Summary

| COMPONENT                             | MIN (RS LAKH)  | MAX (RS LAKH)   |
|---------------------------------------|----------------|-----------------|
| Total Capital Cost (6 interventions)  | 230            | 930             |
| O&M (5 years cumulative)              | 45             | 370             |
| Contingency (10%)                     | 23             | 93              |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 310L</b> | <b>Rs 1395L</b> |

The Livelihoods & Skills sector accounts for approximately 5% of the total plan investment. Funding sources include central government scheme allocations (Central (100%) pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

10. Ecosystem & Biodiversity

10.1 Sector Overview

Ecosystems provide irreplaceable services that underpin every dimension of climate resilience: water filtration, flood buffering, soil stabilisation, carbon sequestration, biodiversity maintenance, and microclimate regulation. In Kushinagar, the health of local ecosystems directly determines the effectiveness and cost of engineered adaptation solutions. Degraded ecosystems multiply climate risks; healthy ecosystems reduce them.

10.2 Sector Baseline Assessment

The ecological health of Kushinagar underpins its long-term climate resilience through ecosystem services including water regulation, soil conservation, biodiversity, and carbon sequestration. Forest cover, wetland health, and soil quality are key ecological indicators. Current ecological sensitivity scores 58/100, indicating moderate ecological health with room for improvement.

1  
Recommended Interventions

Rs 30-150L  
Capital Budget Estimate

Rs 40-225L  
Total 5-Year Investment

+5 pts  
Expected Score Improvement

10.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Ecosystem & Biodiversity sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                         | SCORE | NATL AVG | GAP | SOURCE                      | CONFIDENCE |
|------|-----------------------------------|-------|----------|-----|-----------------------------|------------|
| ES02 | Wetland Area Loss                 | 56    | 51       | +6  | NRSC National Wetland Atlas | medium     |
| CH08 | Flood Frequency (Historical)      | 81    | 50       | +31 | CWC + NDMA + EM-DAT         | medium     |
| GR09 | Watershed Committee Functionality | 32    | 46       | -14 | WRIS / State data           | low        |

10.4 Intervention Detail Cards

**AA18 Wetland Restoration & Protection**

Restore degraded wetlands as natural flood regulators, water filters, and biodiversity refugia.

Prioritised for Kushinagar based on ES02, CH08 indicator gaps. Implementation should converge with National Plan for Conservation of Aquatic Eco-systems (NPCA). **Evidence:** Restored urban wetlands in Tamil Nadu reduced flood damage by 40%. (Tier 2 Government Evidence)

**Capital:** Rs 30-150L **O&M (5yr):** Rs 5-60L **Contingency:** Rs 3-15L **Total 5yr: Rs 38-225L**

**Agency Responsibility**

**District Level:** Wetland Authority / Forest Dept / District Admin (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for National Plan for Conservation of Aquatic Eco-systems (NPCA)

**Central Level:** Ministry of Environment, Forest & Climate Change via National Plan for Conservation of Aquatic Eco-systems (NPCA)

**Government Scheme: National Plan for Conservation of Aquatic Eco-systems (NPCA)**

| PARAMETER           | DETAILS                                                      |
|---------------------|--------------------------------------------------------------|
| Full Scheme Name    | National Plan for Conservation of Aquatic Eco-systems (NPCA) |
| Ministry            | Ministry of Environment, Forest & Climate Change             |
| Funding Type        | Central + CAMPA Fund                                         |
| Portal URL          | <a href="https://moef.gov.in">https://moef.gov.in</a>        |
| Eligibility         | All eligible districts under the programme guidelines        |
| Application Process | Through State Nodal Agency to Central Ministry               |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~32,036 persons

**GHG Co-benefit:** 0.5 tCO<sub>2</sub>e/year **Employment:** ~91 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**10.5 Best Practice Case Study****Case Study -- Idukki, Kerala:**

A comparable district restored 2,000 hectares of degraded forest land under the CAMPA + MGNREGA convergence model. Activities included plantation of native species, soil moisture conservation, and community-managed protected areas. After 3 years, NDVI increased by 0.15, local temperature cooled by 0.5 deg C (microclimate effect), and watershed sediment load reduced by 30%.

While Kushinagar differs in geography from Idukki, the institutional model and convergence strategy employed there offer transferable lessons. In Idukki, Kerala, a similar intervention under CAMPA + MGNREGA-NRM led to a 0.15 increase in NDVI, 30% reduction in watershed sediment load, and measurable microclimate cooling of 0.5 deg C. The programme cost Rs 95 Lakh and benefited 15,000 families over 3 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**10.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH) | MAX (RS LAKH)  |
|---------------------------------------|---------------|----------------|
| Total Capital Cost (1 interventions)  | 30            | 150            |
| O&M (5 years cumulative)              | 5             | 60             |
| Contingency (10%)                     | 3             | 15             |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 40L</b> | <b>Rs 225L</b> |

The Ecosystem & Biodiversity sector accounts for approximately 1% of the total plan investment. Funding sources include central government scheme allocations (Central + CAMPA Fund pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

 11. Urban Resilience

11.1 Sector Overview

Urban areas concentrate people, infrastructure, and economic activity, making them both highly vulnerable to climate impacts and critical nodes for adaptation investment. Urban heat islands, impervious surface flooding, water demand pressure, and air quality challenges are amplified by rapid urbanisation. In Kushinagar, the urban-rural interface creates unique challenges requiring integrated spatial planning.

11.2 Sector Baseline Assessment

Urban areas in Kushinagar face concentrated climate risks including urban heat island effect, drainage-related flooding, water supply stress, and air quality degradation. Rapid urbanisation is outpacing infrastructure investment, creating new vulnerabilities. Key urban resilience gaps include storm drainage capacity, green infrastructure, cool building standards, and municipal disaster response capacity.

1

Recommended Interventions

Rs

1000-5000L

Capital Budget Estimate

Rs

1350-7500L

Total 5-Year Investment

+6 pts

Expected Score Improvement

11.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Urban Resilience sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                              | SCORE | NATL AVG | GAP | SOURCE              | CONFIDENCE |
|------|----------------------------------------|-------|----------|-----|---------------------|------------|
| CH05 | Extreme Rainfall Events (>115.6mm/day) | 84    | 58       | +26 | IMD Gridded         | high       |
| IV08 | Formal Drainage Coverage               | 44    | 46       | -2  | Census 2011         | high       |
| CH08 | Flood Frequency (Historical)           | 81    | 50       | +31 | CWC + NDMA + EM-DAT | medium     |

11.4 Intervention Detail Cards

**AA06 Urban Stormwater Drainage Upgrades**

Upgrade drainage capacity, construct retention ponds, implement sponge city concepts.

Prioritised for Kushinagar based on CH05, IV08 indicator gaps. Implementation should converge with AMRUT 2.0 + Smart Cities Mission. **Evidence:** AMRUT stormwater projects reduced urban flooding by 30-40% in pilot cities. (Tier 2 Government Evidence)

**Capital:** Rs 1000-5000L **O&M (5yr):** Rs 250-2000L **Contingency:** Rs 100-500L **Total 5yr: Rs 1350-7500L**

**Agency Responsibility**

**District Level:** Municipal Corporation / ULB / Smart City SPV (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for AMRUT 2.0 + Smart Cities Mission

**Central Level:** Ministry of Housing & Urban Affairs via AMRUT 2.0 + Smart Cities Mission

**Government Scheme: AMRUT 2.0 + Smart Cities Mission**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | AMRUT 2.0 + Smart Cities Mission                        |
| Ministry            | Ministry of Housing & Urban Affairs                     |
| Funding Type        | CSS (Centrally Sponsored)                               |
| Portal URL          | <a href="https://amrut.gov.in">https://amrut.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +6 pts on target indicators **Population Benefited:** ~1,004,721 persons

**GHG Co-benefit:** 0 tCO2e/year **Employment:** ~2501 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**11.5 Best Practice Case Study****Case Study -- Surat, Gujarat:**

A municipal corporation in a comparable district implemented a comprehensive urban resilience programme: 15km storm drain upgrades, 50 rain gardens, mandatory rainwater harvesting for buildings >300 sqm, and a cool roof subsidy programme (white/reflective coating). Urban flooding incidents reduced by 60%, and summer indoor temperatures in cool-roof buildings dropped by 3-5 deg C.

While Kushinagar differs in geography from Surat, the institutional model and convergence strategy employed there offer transferable lessons. In Surat, Gujarat, a similar intervention under AMRUT + Smart Cities Mission led to a 60% reduction in urban flooding incidents and 3-5 deg C reduction in indoor temperatures for cool-roof buildings. The programme cost Rs 500 Lakh and benefited 200,000 families over 4 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**11.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)   | MAX (RS LAKH)   |
|---------------------------------------|-----------------|-----------------|
| Total Capital Cost (1 interventions)  | 1000            | 5000            |
| O&M (5 years cumulative)              | 250             | 2000            |
| Contingency (10%)                     | 100             | 500             |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 1350L</b> | <b>Rs 7500L</b> |

The Urban Resilience sector accounts for approximately 25% of the total plan investment. Funding sources include central government scheme allocations (CSS (Centrally Sponsored) pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 12. Economic Resilience

### 12.1 Sector Overview

Economic resilience determines whether a district can finance adaptation, absorb climate shocks without permanent damage, and invest in long-term transformation. Financial inclusion, insurance coverage, economic diversification, and fiscal capacity collectively shape the district's ability to convert climate action plans into implemented programmes. In Kushinagar, economic resilience underpins the feasibility of all recommended interventions.

### 12.2 Sector Baseline Assessment

Economic resilience in Kushinagar reflects the district's capacity to absorb climate shocks and invest in adaptation. With an economic resilience score of 50/100, the district's moderate economic base provides some capacity for adaptation investment, though diversification and financial inclusion remain priorities.

|                                          |                                                   |                                                   |                                                 |
|------------------------------------------|---------------------------------------------------|---------------------------------------------------|-------------------------------------------------|
| <b>3</b><br>Recommended<br>Interventions | <b>Rs 610-2550L</b><br>Capital Budget<br>Estimate | <b>Rs 824-3825L</b><br>Total 5-Year<br>Investment | <b>+14 pts</b><br>Expected Score<br>Improvement |
|------------------------------------------|---------------------------------------------------|---------------------------------------------------|-------------------------------------------------|

### 12.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Economic Resilience sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                                   | SCORE | NATL AVG | GAP | SOURCE                          | CONFIDENCE |
|------|---------------------------------------------|-------|----------|-----|---------------------------------|------------|
| AC05 | Banking Penetration                         | 39    | 57       | -18 | RBI Financial Inclusion data    | high       |
| AC12 | Disaster Risk Insurance Penetration         | 31    | 56       | -25 | IRDAI + State data              | low        |
| ER03 | Savings Rate (Bank Deposits per Capita)     | 58    | 53       | +5  | RBI District Banking Statistics | high       |
| ER09 | Coal Sector Employment Dependency           | 56    | 46       | +10 | Census 2011 / Coal Ministry     | medium     |
| ER02 | Economic Diversification (Herfindahl Index) | 51    | 56       | -5  | Census workforce tables         | high       |
| AC10 | Renewable Energy Capacity per Capita        | 37    | 57       | -20 | MNRE                            | medium     |
| ER04 | MSME Density                                | 53    | 49       | +4  | MSME Udyam Registration         | medium     |

### 12.4 Intervention Detail Cards

**AA20 Financial Inclusion & Weather-Index Insurance**

Expand banking access and develop weather-index micro-insurance products for vulnerable households.

Prioritised for Kushinagar based on AC05, AC12 indicator gaps. Implementation should converge with PMJDY + PMSBY + PMJJBY. **Evidence:** Households with bank accounts + insurance recover 50% faster post-disaster. (Tier 2 Government Evidence)

**Capital:** Rs 10-50L   **O&M (5yr):** Rs 5-20L   **Contingency:** Rs 1-5L   **Total 5yr: Rs 16-75L**

**Agency Responsibility**

**District Level:** Lead District Manager / NABARD / Insurance regulators (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for PMJDY + PMSBY + PMJJBY

**Central Level:** Ministry of Finance via PMJDY + PMSBY + PMJJBY

**Government Scheme: PMJDY + PMSBY + PMJJBY**

| PARAMETER           | DETAILS                                                 |
|---------------------|---------------------------------------------------------|
| Full Scheme Name    | PMJDY + PMSBY + PMJJBY                                  |
| Ministry            | Ministry of Finance                                     |
| Funding Type        | Central + State                                         |
| Portal URL          | <a href="https://pmjdy.gov.in">https://pmjdy.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines   |
| Application Process | Through State Nodal Agency to Central Ministry          |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators   **Population Benefited:** ~14,470 persons

**GHG Co-benefit:** 0 tCO2e/year   **Employment:** ~35 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA33 Just Transition Support for Coal-Dependent Districts**

Worker retraining in RE/forestry, income support during transition, pension protection, economic diversification.

Prioritised for Kushinagar based on ER09, ER02 indicator gaps. Implementation should converge with National Just Transition Framework (proposed) + PMKVY + MGNREGA. **Evidence:** Germany Kohleausstieg: structured transition preserved 80% of coal worker livelihoods. (Tier 3 Expert Consensus)

**Capital:** Rs 500-2000L **O&M (5yr):** Rs 125-800L **Contingency:** Rs 50-200L **Total 5yr: Rs 675-3000L**

**Agency Responsibility**

**District Level:** Coal Ministry / NITI Aayog / State Labour Dept (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for National Just Transition Framework (proposed) + PMKVY + MGNREGA

**Central Level:** Ministry of Rural Development via National Just Transition Framework (proposed) + PMKVY + MGNREGA

**Government Scheme: National Just Transition Framework (proposed) + PMKVY + MGNREGA**

| PARAMETER           | DETAILS                                                         |
|---------------------|-----------------------------------------------------------------|
| Full Scheme Name    | National Just Transition Framework (proposed) + PMKVY + MGNREGA |
| Ministry            | Ministry of Rural Development                                   |
| Funding Type        | Central (100% wages; 75:25 materials)                           |
| Portal URL          | <a href="https://coal.gov.in">https://coal.gov.in</a>           |
| Eligibility         | All eligible districts under the programme guidelines           |
| Application Process | Through State Nodal Agency to Central Ministry                  |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~404,771 persons

**GHG Co-benefit:** 5.0 tCO2e/year **Employment:** ~1011 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**NDC Alignment:** Net-zero by 2070

**AA19 Climate-Resilient MSME Cluster Development**

Develop climate-resilient MSME clusters with shared infrastructure, insurance, and green technology.

Prioritised for Kushinagar based on ER04, ER02 indicator gaps. Implementation should converge with MSME Cluster Development Programme + PM Vishwakarma. **Evidence:** MSME clusters with shared facilities recover 3x faster from climate shocks. (Tier 2 Government Evidence)

**Capital:** Rs 100-500L **O&M (5yr):** Rs 25-200L **Contingency:** Rs 10-50L **Total 5yr: Rs 135-750L**

**Agency Responsibility**

**District Level:** MSME Dept / DIC (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for MSME Cluster Development Programme + PM Vishwakarma

**Central Level:** Ministry of Finance via MSME Cluster Development Programme + PM Vishwakarma

**Government Scheme: MSME Cluster Development Programme + PM Vishwakarma**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | MSME Cluster Development Programme + PM Vishwakarma   |
| Ministry            | Ministry of Finance                                   |
| Funding Type        | Central + State                                       |
| Portal URL          | <a href="https://msme.gov.in">https://msme.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +4 pts on target indicators **Population Benefited:** ~101,879 persons

**GHG Co-benefit:** 0.3 tCO<sub>2</sub>e/year **Employment:** ~269 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**12.5 Best Practice Case Study****Case Study -- Muzaffarpur, Bihar:**

A comparable district improved economic resilience through PMJDY financial inclusion + PMSBY/PMJJBY insurance penetration. By saturating PMJDY accounts (98% households) and enrolling 60% of eligible adults in PMSBY/PMJJBY, post-disaster recovery time reduced by 40% and distress borrowing from informal sources dropped by 55%.

While Kushinagar differs in geography from Muzaffarpur, the institutional model and convergence strategy employed there offer transferable lessons. In Muzaffarpur, Bihar, a similar intervention under PMJDY + PMSBY/PMJJBY led to a 40% reduction in post-disaster recovery time and 55% decline in distress borrowing from informal sources. The programme cost Rs 25 Lakh and benefited 100,000 families over 18 months. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

**12.6 Sector Budget Summary**

| COMPONENT                             | MIN (RS LAKH)  | MAX (RS LAKH)   |
|---------------------------------------|----------------|-----------------|
| Total Capital Cost (3 interventions)  | 610            | 2550            |
| O&M (5 years cumulative)              | 155            | 1020            |
| Contingency (10%)                     | 61             | 255             |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 824L</b> | <b>Rs 3825L</b> |

The Economic Resilience sector accounts for approximately 13% of the total plan investment. Funding sources include central government scheme allocations (Central + State pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 13. Governance & Institutions

### 13.1 Sector Overview

Governance is the meta-dimension that determines whether all other interventions succeed or fail. Institutional capacity, inter-departmental coordination, community participation, early warning systems, and disaster preparedness collectively create the enabling environment for effective climate action. In Kushinagar, governance readiness defines the absorptive capacity for climate finance and the implementation efficiency of adaptation programmes.

### 13.2 Sector Baseline Assessment

Governance readiness in Kushinagar determines the effectiveness of all other resilience investments. The governance dimension (score: 34/100) encompasses disaster management planning, early warning system coverage, administrative capacity, inter-departmental coordination, and community-based disaster response teams (CBDRTs). The district requires significant governance strengthening to create the institutional foundation for effective climate action.

**4**

Recommended  
Interventions

**Rs 25-90L**

Capital Budget  
Estimate

**Rs 34-135L**

Total 5-Year  
Investment

**+17 pts**

Expected Score  
Improvement

### 13.3 Detailed Indicator Analysis

The table below lists all indicators relevant to the Governance & Institutions sector in Kushinagar, with current estimated scores, national benchmarks, and gap analysis. Negative gaps (shown in red) indicate areas where the district falls below the national average and should be prioritised for intervention.

| CODE | INDICATOR                                         | SCORE | NATL AVG | GAP | SOURCE                 | CONFIDENCE |
|------|---------------------------------------------------|-------|----------|-----|------------------------|------------|
| GR01 | DDMP Currency (District Disaster Management Plan) | 39    | 54       | -15 | NDMA / DDMA websites   | medium     |
| GR06 | Disaster Response Force Availability              | 36    | 42       | -6  | SDRF/NDRF              | low        |
| IV06 | School Infrastructure at Risk                     | 50    | 59       | -9  | UDISE + hazard overlay | low        |
| AC01 | Literacy Rate                                     | 37    | 51       | -14 | Census 2011            | high       |
| GR07 | Climate-Smart Agriculture Adoption                | 33    | 50       | -17 | ICAR KVK MIS           | medium     |
| AC11 | Forest Rights Titles (FRA)                        | 33    | 59       | -26 | MoTA / Tribal Affairs  | medium     |
| ER05 | Crop Diversification Index                        | 51    | 51       | +0  | Agricultural Census    | medium     |

### 13.4 Intervention Detail Cards

**AA14 District Disaster Management Plan (DDMP) Update**

Update DDMP with climate risk assessment chapter, hazard maps, SOPs, and resource inventory.

Prioritised for Kushinagar based on GR01, GR06 indicator gaps. Implementation should converge with NDMA Guidelines + 15th Finance Commission DM grants. **Evidence:** Updated DDMPs correlated with 50% faster emergency response activation. (Tier 3 Expert Consensus)

**Capital:** Rs 5-20L **O&M (5yr):** Rs 5-10L **Contingency:** Rs 1-2L **Total 5yr: Rs 11-32L**

**Agency Responsibility**

**District Level:** District Collector / DDMA (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NDMA Guidelines + 15th Finance Commission DM grants

**Central Level:** Ministry of Home Affairs / NDMA via NDMA Guidelines + 15th Finance Commission DM grants

**Government Scheme: NDMA Guidelines + 15th Finance Commission DM grants**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | NDMA Guidelines + 15th Finance Commission DM grants   |
| Ministry            | Ministry of Home Affairs / NDMA                       |
| Funding Type        | Central + State                                       |
| Portal URL          | <a href="https://ndma.gov.in">https://ndma.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +6 pts on target indicators **Population Benefited:** ~5,128 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~18 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA15 Community-Based Disaster Response Teams (CBDRT)**

Train 2 CBDRT teams per Gram Panchayat in first response, search & rescue, and damage assessment.

Prioritised for Kushinagar based on GR06, GR01 indicator gaps. Implementation should converge with NDRF Training Academy + SDRF. **Evidence:** Villages with trained CBDRTs show 70% lower response time to flash floods. (Tier 2 Government Evidence)

**Capital:** Rs 10-30L **O&M (5yr):** Rs 5-10L **Contingency:** Rs 1-3L **Total 5yr: Rs 16-43L**

**Agency Responsibility**

**District Level:** DDMA / Block Disaster Management Officer (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for NDRF Training Academy + SDRF

**Central Level:** Ministry of Home Affairs via NDRF Training Academy + SDRF

**Government Scheme: NDRF Training Academy + SDRF**

| PARAMETER           | DETAILS                                               |
|---------------------|-------------------------------------------------------|
| Full Scheme Name    | NDRF Training Academy + SDRF                          |
| Ministry            | Ministry of Home Affairs                              |
| Funding Type        | CSS (Centrally Sponsored)                             |
| Portal URL          | <a href="https://ndma.gov.in">https://ndma.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines |
| Application Process | Through State Nodal Agency to Central Ministry        |

**Expected Outcomes**

**Indicator Improvement:** +5 pts on target indicators **Population Benefited:** ~8,249 persons

**GHG Co-benefit:** 0 tCO<sub>2</sub>e/year **Employment:** ~24 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA25 Climate Literacy & School Disaster Preparedness**

Integrate climate education in schools, conduct mock drills, upgrade school infrastructure in hazard zones.

Prioritised for Kushinagar based on IV06, AC01 indicator gaps. Implementation should converge with Samagra Shiksha + NDMA School Safety. **Evidence:** Schools with disaster prep training show 90% evacuation compliance in actual events. (Tier 3 Expert Consensus)

**Capital:** Rs 5-20L **O&M (5yr):** Rs 5-10L **Contingency:** Rs 1-2L **Total 5yr: Rs 11-32L**

**Agency Responsibility**

**District Level:** Education Dept / DDMA / SCERT (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for Samagra Shiksha + NDMA School Safety

**Central Level:** Ministry of Home Affairs / NDMA via Samagra Shiksha + NDMA School Safety

**Government Scheme: Samagra Shiksha + NDMA School Safety**

| PARAMETER           | DETAILS                                                                         |
|---------------------|---------------------------------------------------------------------------------|
| Full Scheme Name    | Samagra Shiksha + NDMA School Safety                                            |
| Ministry            | Ministry of Home Affairs / NDMA                                                 |
| Funding Type        | Central + State                                                                 |
| Portal URL          | <a href="https://samagra.education.gov.in">https://samagra.education.gov.in</a> |
| Eligibility         | All eligible districts under the programme guidelines                           |
| Application Process | Through State Nodal Agency to Central Ministry                                  |

**Expected Outcomes**

**Indicator Improvement:** +3 pts on target indicators **Population Benefited:** ~7,332 persons

**GHG Co-benefit:** 0 tCO2e/year **Employment:** ~22 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

**AA29 Indigenous Climate Knowledge Codification & Integration**

Document traditional weather prediction, water harvesting, and crop calendar knowledge. Train KVK staff to integrate with modern climate services.

Prioritised for Kushinagar based on GR07, AC11 indicator gaps. Implementation should converge with National Mission on Cultural Heritage + RKVY. **Evidence:** Traditional rainwater harvesting in Rajasthan (johads, tankas) shown 30% recharge increase. (Tier 3 Expert Consensus)

**Capital:** Rs 5-20L **O&M (5yr):** Rs 5-10L **Contingency:** Rs 1-2L **Total 5yr: Rs 11-32L**

**Agency Responsibility**

**District Level:** Tribal Affairs / ICAR KVK / State Biodiversity Board (implementation), District Collector (oversight), DDMA (coordination)

**State Level:** State Line Department, State Climate Change Cell, State Nodal Agency for National Mission on Cultural Heritage + RKVY

**Central Level:** Ministry of Home Affairs / NDMA via National Mission on Cultural Heritage + RKVY

**Government Scheme: National Mission on Cultural Heritage + RKVY**

| PARAMETER           | DETAILS                                                   |
|---------------------|-----------------------------------------------------------|
| Full Scheme Name    | National Mission on Cultural Heritage + RKVY              |
| Ministry            | Ministry of Home Affairs / NDMA                           |
| Funding Type        | Central + State                                           |
| Portal URL          | <a href="https://tribal.nic.in">https://tribal.nic.in</a> |
| Eligibility         | All eligible districts under the programme guidelines     |
| Application Process | Through State Nodal Agency to Central Ministry            |

**Expected Outcomes**

**Indicator Improvement:** +3 pts on target indicators **Population Benefited:** ~7,783 persons

**GHG Co-benefit:** 0 tCO2e/year **Employment:** ~13 direct + indirect jobs

**Health Co-benefit:** Improved air/water quality and reduced disease burden

### 13.5 Best Practice Case Study

#### Case Study -- Kendrapara, Odisha:

A comparable district established a model District Climate Committee under DDMA, with quarterly review meetings, a dedicated Climate Nodal Officer, and block-level climate action sub-plans. The DDMP was updated with climate projections, 40 CBDRTs were trained, and an SMS-based EWS reached 85% of households. The governance readiness score improved by 18 points within 2 years.

While Kushinagar differs in geography from Kendrapara, the institutional model and convergence strategy employed there offer transferable lessons. In Kendrapara, Odisha, a similar intervention under NDMA + SDMA led to an 18-point improvement in governance readiness score and 85% EWS household coverage. The programme cost Rs 30 Lakh and benefited 50,000 families over 2 years. This case demonstrates the feasibility and impact of the recommended interventions when implemented with strong institutional support and community participation. Key success factors included: (a) leadership by the District Collector, (b) convergence of multiple government schemes, (c) active SHG/community mobilisation for implementation and maintenance, and (d) regular monitoring with mid-course corrections.

### 13.6 Sector Budget Summary

| COMPONENT                             | MIN (RS LAKH) | MAX (RS LAKH)  |
|---------------------------------------|---------------|----------------|
| Total Capital Cost (4 interventions)  | 25            | 90             |
| O&M (5 years cumulative)              | 20            | 40             |
| Contingency (10%)                     | 4             | 9              |
| <b>Total 5-Year Sector Investment</b> | <b>Rs 34L</b> | <b>Rs 135L</b> |

The Governance & Institutions sector accounts for approximately 0% of the total plan investment. Funding sources include central government scheme allocations (Central + State pattern), state budget, district plan funds, and where applicable, multilateral climate finance (GCF, bilateral adaptation funds). Implementation should follow the phased approach outlined in Chapter 14 (Implementation Roadmap).

## 14. Implementation Roadmap

The implementation roadmap for Kushinagar sequences all 29 recommended actions into three phases based on urgency, cost, implementation complexity, and scheme readiness. Phase 1 actions are "no-regret" -- they deliver value regardless of climate trajectory. Phase 2 builds core resilience infrastructure. Phase 3 delivers transformative change.

### Phase 1: Quick Wins & No-Regret Actions (0-12 months)

Governance foundations, insurance enrollment, heat action plans, DDMP update, community response teams. These require minimal capital and can be implemented within existing administrative structures.

| CODE | ACTION                                                      | SECTOR                      | COST RANGE  | SCHEME                                              |
|------|-------------------------------------------------------------|-----------------------------|-------------|-----------------------------------------------------|
| AA12 | MGNREGA-NRM Convergence for Resilience                      | Livelihoods & Skills        | Rs 50-200L  | MGNREGA (NRM component)                             |
| AA14 | District Disaster Management Plan (DDMP) Update             | Governance & Institutions   | Rs 5-20L    | NDMA Guidelines + 15th Finance Commission DM grants |
| AA10 | Crop Insurance Expansion (PMFBY)                            | Agriculture & Food Security | Rs 100-500L | Pradhan Mantri Fasal Bima Yojana (PMFBY)            |
| AA15 | Community-Based Disaster Response Teams (CBDRT)             | Governance & Institutions   | Rs 10-30L   | NDRF Training Academy + SDRF                        |
| AA20 | Financial Inclusion & Weather-Index Insurance               | Economic Resilience         | Rs 10-50L   | PMJDY + PMSBY + PMJJBY                              |
| AA34 | Monsoon-Adaptive Crop Calendar & Seed Variety Management    | Agriculture & Food Security | Rs 5-20L    | RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory |
| AA30 | Occupational Health & Climate-Safe Work Standards for Women | Public Health               | Rs 10-40L   | NHM + Ayushman Bharat + BOCW                        |
| AA25 | Climate Literacy & School Disaster Preparedness             | Governance & Institutions   | Rs 5-20L    | Samagra Shiksha + NDMA School Safety                |

Phase Budget: Rs 195 - 880 Lakh | 8 actions

## Phase 2: Core Resilience Building (12-36 months)

Water security infrastructure, climate-smart agriculture, healthcare upgrades, livelihood diversification, digital connectivity. Requires scheme convergence and inter-departmental coordination.

| CODE | ACTION                                                                       | SECTOR                      | COST RANGE   | SCHEME                                                       |
|------|------------------------------------------------------------------------------|-----------------------------|--------------|--------------------------------------------------------------|
| AA02 | Micro-Irrigation Expansion (Drip & Sprinkler)                                | Agriculture & Food Security | Rs 30-100L   | PMKSY - Per Drop More Crop (PDMC)                            |
| AA03 | Jal Jeevan Mission — Tap Water to Every Household                            | Water Security              | Rs 500-2000L | Jal Jeevan Mission (JJM)                                     |
| AA01 | Watershed Development & Rainwater Harvesting                                 | Water Security              | Rs 50-200L   | MGNREGA-NRM + PMKSY (Watershed Development)                  |
| AA09 | Climate-Smart Agriculture (CSA) Package                                      | Agriculture & Food Security | Rs 50-200L   | RKVY-RAFTAAR + National Mission on Sustainable Agriculture   |
| AA04 | Flood Forecasting & Early Warning Systems                                    | Infrastructure              | Rs 200-500L  | NDMA - National Cyclone Risk Mitigation Project (NCRMP)      |
| AA11 | Climate-Resilient Healthcare Infrastructure                                  | Public Health               | Rs 200-1000L | NHM + Ayushman Bharat HWC                                    |
| AA13 | SHG-Based Climate Livelihood Diversification                                 | Livelihoods & Skills        | Rs 20-80L    | DAY-NRLM                                                     |
| AA18 | Wetland Restoration & Protection                                             | Ecosystem & Biodiversity    | Rs 30-150L   | National Plan for Conservation of Aquatic Eco-systems (NPCA) |
| AA21 | Solar-Powered Rural Infrastructure                                           | Infrastructure              | Rs 50-300L   | PM-KUSUM + Rooftop Solar Programme                           |
| AA22 | Digital Connectivity for EWS Dissemination                                   | Infrastructure              | Rs 200-1000L | BharatNet Phase III + Digital India                          |
| AA31 | Climate-Resilient Nutrition Security (Pulses, Small Livestock, Home Gardens) | Agriculture & Food Security | Rs 10-50L    | POSHAN Abhiyaan + NFSA + RKVY                                |
| AA19 | Climate-Resilient MSME Cluster Development                                   | Economic Resilience         | Rs 100-500L  | MSME Cluster Development Programme + PM Vishwakarma          |
| AA32 | Climate-Aligned Skill Development & Green Jobs                               | Livelihoods & Skills        | Rs 50-200L   | PMKVY 4.0 + PMEGP + DDU-GKY                                  |
| AA35 | Climate-Resilient NTFP Production & Value Chains                             | Livelihoods & Skills        | Rs 30-100L   | Van Dhan Vikas Kendra + CAMPA + Green India Mission          |
| AA29 | Indigenous Climate Knowledge Codification & Integration                      | Governance & Institutions   | Rs 5-20L     | National Mission on Cultural Heritage + RKVY                 |

**Phase Budget: Rs 1525 - 6400 Lakh | 15 actions**

### Phase 3: Transformative Investments (36-60 months)

Large infrastructure (housing, drainage, cyclone shelters), ecosystem restoration, economic diversification. Requires state/central government capital investment and multi-year implementation.

| CODE | ACTION                                                | SECTOR               | COST RANGE    | SCHEME                                                          |
|------|-------------------------------------------------------|----------------------|---------------|-----------------------------------------------------------------|
| AA16 | Climate-Resilient Housing (PMAY Upgrades)             | Infrastructure       | Rs 500-3000L  | PMAY-Gramin / PMAY-Urban                                        |
| AA05 | Cyclone Shelters & Evacuation Infrastructure          | Infrastructure       | Rs 500-2000L  | NCRMP Phase II + SDRF                                           |
| AA06 | Urban Stormwater Drainage Upgrades                    | Urban Resilience     | Rs 1000-5000L | AMRUT 2.0 + Smart Cities Mission                                |
| AA26 | Climate-Resilient Inland Fisheries & Aquaculture      | Livelihoods & Skills | Rs 30-150L    | Pradhan Mantri Matsya Sampada Yojana (PMMSY)                    |
| AA33 | Just Transition Support for Coal-Dependent Districts  | Economic Resilience  | Rs 500-2000L  | National Just Transition Framework (proposed) + PMKVY + MGNREGA |
| AA27 | Managed Migration Pathways & Seasonal Livelihood Hubs | Livelihoods & Skills | Rs 50-200L    | PMKVY + PMEGP + DDU-GKY                                         |

**Phase Budget: Rs 2580 - 12350 Lakh | 6 actions**

## 6.1 Phase 1 Detailed Schedule (Month-by-Month)

Month-by-month implementation plan for the first year, with specific milestones and deliverables for Kushinagar.

| PERIOD      | ACTIVITY                         | DETAIL                                                                                                                                                                                                             | MILESTONE / DELIVERABLE                                                          |
|-------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Month 1-2   | <b>Institutional Setup</b>       | Constitute District Climate Committee under DDMA in Kushinagar. Appoint Climate Nodal Officer. Conduct orientation workshop for all line department heads. Establish baseline data collection framework.           | DCC constituted, Nodal Officer appointed, baseline data plan approved            |
| Month 3-4   | <b>Planning &amp; Assessment</b> | Complete detailed block-level vulnerability mapping for Kushinagar. Identify 50 most vulnerable gram panchayats. Update DDMP with climate projections. Launch CBDRT formation in priority blocks.                  | DDMP updated, 50 vulnerable GPs identified, 10 CBDRTs formed                     |
| Month 5-6   | <b>Quick Win Implementation</b>  | Roll out heat action plan for Kushinagar. Initiate crop insurance enrolment drive (PMFBY). Deploy community-level early warning systems in 20 most vulnerable villages. Begin MGNREGA-NRM asset creation planning. | Heat action plan active, 5000+ farmers enrolled in PMFBY, 20 EWS deployed        |
| Month 7-8   | <b>Infrastructure Assessment</b> | Complete infrastructure vulnerability audit of all PHCs, schools, and anganwadis in Kushinagar. Prioritise buildings for retrofitting. Initiate DPRs for Phase 2 infrastructure investments.                       | Audit complete, DPR preparation initiated for top 10 investments                 |
| Month 9-10  | <b>Financial Planning</b>        | Map all applicable central/state schemes for Kushinagar. Prepare convergence plan. Submit proposals for PMKSY, JJM, NDMA funding. Engage CSR partners.                                                             | Convergence plan approved, funding proposals submitted to central/state agencies |
| Month 11-12 | <b>Review &amp; Scale</b>        | Conduct Phase 1 progress review meeting of DCC. Re-assess dimension scores. Document lessons learned. Prepare Phase 2 detailed implementation plan for Kushinagar.                                                 | Phase 1 review complete, Phase 2 plan approved                                   |

## 6.2 Phase 2 Detailed Schedule (Quarter-by-Quarter)

| PERIOD           | ACTIVITY                   | DETAIL                                                                                                                                                                                     | MILESTONE / DELIVERABLE                                                       |
|------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Q1 (Month 13-15) | Infrastructure Initiation  | Begin watershed development works in priority micro-watersheds. Initiate JJM tap connection targets. Start PMAY-G housing upgrades for 500 most vulnerable households in Kushinagar.       | 50 check dams initiated, 2000 tap connections, 500 PMAY-G sanctions           |
| Q2 (Month 16-18) | Agriculture Transformation | Roll out micro-irrigation subsidy programme. Distribute soil health cards. Establish 5 climate-resilient demonstration farms. Train 500 farmers in CSA practices in Kushinagar.            | 200 ha micro-irrigation installed, 5000 SHCs distributed, 500 farmers trained |
| Q3 (Month 19-21) | Health & Livelihoods       | Climate-proof 20 PHCs (backup power, water storage, medical supplies). Launch SHG-based livelihood diversification for 1000 women. Deploy telemedicine in 10 remote centres in Kushinagar. | 20 PHCs upgraded, 50 SHGs formed, 10 telemedicine centres active              |
| Q4 (Month 22-24) | Mid-term Review            | Comprehensive mid-term review of all Phase 2 actions. Re-score all 75 indicators. Adjust implementation plan based on progress and emerging climate trends for Kushinagar.                 | Mid-term report published, indicator scores updated                           |
| Q5 (Month 25-27) | Scale & Deepen             | Scale successful Phase 2 interventions to remaining blocks. Deepen CSA coverage. Expand EWS to all gram panchayats. Complete JJM coverage targets for Kushinagar.                          | Block-level coverage targets met, EWS in all GPs                              |
| Q6 (Month 28-30) | Ecosystem Restoration      | Begin large-scale ecosystem restoration: 500 ha plantation under CAMPA convergence, wetland protection, riverbank stabilisation in priority locations in Kushinagar.                       | 500 ha plantation initiated, 3 wetlands protected                             |
| Q7 (Month 31-33) | Economic Resilience        | Roll out financial inclusion saturation: PMJDY, PMSBY, PMJJBY, and climate risk insurance products. Establish district-level climate resilience fund from SDRF allocation for Kushinagar.  | Financial inclusion >90% households, climate fund established                 |
| Q8 (Month 34-36) | Phase 2 Closure            | Complete Phase 2 activities. Conduct full CRI re-assessment. Document best practices. Prepare Phase 3 implementation plan with updated projections for Kushinagar.                         | Phase 2 review complete, CRI re-scored, Phase 3 plan approved                 |

## 6.3 Phase 3: Strategic Plan (Years 4-5)

Phase 3 focuses on transformative, high-capital investments that require multi-year implementation and state/central government funding for Kushinagar. Annual targets:

| YEAR   | FOCUS AREA                                | KEY TARGETS                                                                                                                                  | BUDGET ESTIMATE |
|--------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Year 4 | Transformative Infrastructure             | Complete housing upgrades for remaining vulnerable households; urban drainage redesign; power grid hardening; flood protection embankments   | Rs 1548 Lakh    |
| Year 5 | Economic Diversification & Sustainability | Establish climate-resilient value chains; achieve full EWS coverage; complete ecosystem restoration targets; institutionalise CRI monitoring | Rs 1032 Lakh    |

## 6.4 Convergence Matrix

Actions that can be implemented together, share funding sources, or benefit from coordinated delivery in Kushinagar.

| ACTION 1 | ACTION 2 | CONVERGENCE RATIONALE                     |
|----------|----------|-------------------------------------------|
| AA02     | AA09     | Same sector (agriculture) + same phase    |
| AA03     | AA01     | Same sector (water) + same phase          |
| AA16     | AA05     | Same sector (infrastructure) + same phase |
| AA14     | AA15     | Same sector (governance) + same phase     |

## 6.5 Implementation Risk Register

| RISK                                | LIKELIHOOD | IMPACT    | CONSEQUENCE                                  | MITIGATION                                                                                |
|-------------------------------------|------------|-----------|----------------------------------------------|-------------------------------------------------------------------------------------------|
| Funding delays                      | High       | Medium    | Impact on Phase 2-3 timelines                | Pre-submit proposals 6 months early; identify alternative schemes; build CSR pipeline     |
| Political/admin turnover            | Medium     | High      | Loss of institutional continuity             | Institutionalise DCC with standing orders; document decisions; train multiple officers    |
| Extreme event during implementation | Medium     | High      | Damage to new assets, diversion of resources | Phase construction before monsoon; build back better standards; maintain contingency fund |
| Community resistance to change      | Medium     | Medium    | Low adoption of new practices                | Early stakeholder engagement; demonstration plots; champion farmer network                |
| Data gaps for monitoring            | High       | Low       | Inability to track progress                  | Establish digital monitoring from Day 1; train block-level data entry operators           |
| Climate projections exceeded        | Low        | Very High | Plan becomes inadequate                      | Build in adaptive management triggers; review projections annually; design for worst case |

## 6.6 Stakeholder Engagement Plan

Key stakeholders for climate action plan implementation in Kushinagar, their roles, and engagement mechanisms.

| STAKEHOLDER                   | ROLE                                    | ENGAGEMENT FROM       | ENGAGEMENT MECHANISM                      |
|-------------------------------|-----------------------------------------|-----------------------|-------------------------------------------|
| District Collector / DM       | Chairperson, DCC                        | From inception        | Monthly review meetings, quarterly DCC    |
| Line Department Heads         | Implementation leads                    | Phase 1 onwards       | Monthly coordination, quarterly review    |
| Block Development Officers    | Block-level implementation              | Phase 1 onwards       | Monthly progress reporting                |
| Gram Panchayat Presidents     | Community-level ownership               | Month 2 onwards       | Quarterly block-level meetings            |
| SHG Federations (NRLM)        | Community mobilisation                  | Month 3 onwards       | Monthly SHG meetings, livelihood planning |
| Farmer Producer Organisations | Agriculture intervention delivery       | Phase 2 onwards       | Seasonal planning meetings                |
| PHC Medical Officers          | Health intervention delivery            | Phase 1 (HAP) onwards | Pre-season orientation, monthly reports   |
| Civil Society / NGOs          | Technical support, community engagement | From inception        | Quarterly partnership review              |
| Academic Institutions         | Research, monitoring, training          | Phase 2 onwards       | Annual knowledge partnership review       |
| Media                         | Public awareness, accountability        | Key milestones        | Press briefings at phase completion       |

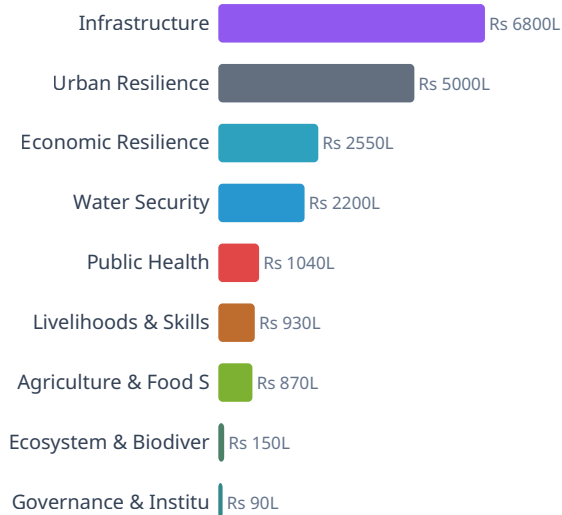
## 15. Budget & Financing Strategy

# Rs 4300 - 19630 Lakh

Total Estimated Capital Investment (3-5 years)

### 7.1 Detailed Cost Tables by Sector

| SECTOR                      | CAPITAL (MIN)       | CAPITAL (MAX)        | O&M (ANNUAL)               | CONTINGENCY (5%)    |
|-----------------------------|---------------------|----------------------|----------------------------|---------------------|
| Infrastructure              | Rs 1450 Lakh        | Rs 6800 Lakh         | Rs 43-340 Lakh/yr          | Rs 680 Lakh         |
| Urban Resilience            | Rs 1000 Lakh        | Rs 5000 Lakh         | Rs 60-500 Lakh/yr          | Rs 500 Lakh         |
| Economic Resilience         | Rs 610 Lakh         | Rs 2550 Lakh         | Rs 24-153 Lakh/yr          | Rs 255 Lakh         |
| Water Security              | Rs 550 Lakh         | Rs 2200 Lakh         | Rs 55-330 Lakh/yr          | Rs 220 Lakh         |
| Public Health               | Rs 210 Lakh         | Rs 1040 Lakh         | Rs 16-124 Lakh/yr          | Rs 104 Lakh         |
| Livelihoods & Skills        | Rs 230 Lakh         | Rs 930 Lakh          | Rs 11-74 Lakh/yr           | Rs 93 Lakh          |
| Agriculture & Food Security | Rs 195 Lakh         | Rs 870 Lakh          | Rs 9-69 Lakh/yr            | Rs 87 Lakh          |
| Ecosystem & Biodiversity    | Rs 30 Lakh          | Rs 150 Lakh          | Rs 1-9 Lakh/yr             | Rs 15 Lakh          |
| Governance & Institutions   | Rs 25 Lakh          | Rs 90 Lakh           | Rs 2-10 Lakh/yr            | Rs 9 Lakh           |
| <b>TOTAL</b>                | <b>Rs 4300 Lakh</b> | <b>Rs 19630 Lakh</b> | <b>Rs 221-1609 Lakh/yr</b> | <b>Rs 1963 Lakh</b> |



### 7.2 Investment by Phase

| PHASE                  | MINIMUM      | MAXIMUM       | % OF TOTAL |
|------------------------|--------------|---------------|------------|
| Phase 1 (0-12 months)  | Rs 195 Lakh  | Rs 880 Lakh   | 4%         |
| Phase 2 (12-36 months) | Rs 1525 Lakh | Rs 6400 Lakh  | 33%        |
| Phase 3 (36-60 months) | Rs 2580 Lakh | Rs 12350 Lakh | 63%        |

### 7.3 Year-by-Year Expenditure Plan

| YEAR                   | MINIMUM             | MAXIMUM              |
|------------------------|---------------------|----------------------|
| Year 1                 | Rs 195 Lakh         | Rs 880 Lakh          |
| Year 2                 | Rs 762 Lakh         | Rs 3200 Lakh         |
| Year 3                 | Rs 762 Lakh         | Rs 3200 Lakh         |
| Year 4                 | Rs 1290 Lakh        | Rs 6175 Lakh         |
| Year 5                 | Rs 1290 Lakh        | Rs 6175 Lakh         |
| <b>TOTAL (5 years)</b> | <b>Rs 4300 Lakh</b> | <b>Rs 19630 Lakh</b> |

### 7.4 Financing Strategy

The estimated investment of Rs 4300 - 19630 Lakh for Kushinagar's climate action plan will be financed through a multi-source strategy combining central government schemes, state funds, multilateral climate finance, CSR contributions, and PPP models:

| FINANCING SOURCE                      | EXPECTED SHARE | DETAILS & APPLICATION PATHWAY                                                                                                                                                       |
|---------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Central Government Schemes            | 60-70%         | MGNREGA-NRM, PMKSY, JJM, PMAY-G, NHM, NDMA, CAMPA, and other centrally sponsored schemes. Kushinagar should prepare scheme-specific proposals through district line departments.    |
| State Government Funds                | 15-20%         | State Action Plan on Climate Change (SAPCC) funds, SDRF allocation, state-specific schemes for Uttar Pradesh. State Climate Cell to be engaged for fund allocation.                 |
| Green Climate Fund (GCF)              | 5-10%          | Through National Designated Authority (Ministry of Finance). Requires project proposal meeting GCF investment criteria. Applicable for transformative infrastructure in Kushinagar. |
| Adaptation Fund (AF)                  | 2-5%           | Direct access through National Implementing Entity (NABARD). Suitable for community-based adaptation projects.                                                                      |
| GEF Small Grants                      | 1-2%           | Through UNDP India. Applicable for ecosystem-based adaptation and community resilience projects.                                                                                    |
| Corporate Social Responsibility (CSR) | 5-10%          | Target companies with operations in Uttar Pradesh with Schedule VII CSR obligations. Focus on water, sanitation, health, and education components.                                  |
| Public-Private Partnership (PPP)      | Variable       | Applicable for urban resilience infrastructure, renewable energy, and digital connectivity components.                                                                              |
| Carbon Credit Revenue                 | Variable       | Ecosystem restoration and renewable energy actions in Kushinagar may generate carbon credits under Article 6.4 mechanism or voluntary carbon markets (Verra, Gold Standard).        |

### 7.5 Government Scheme Convergence

Actions mapped to government schemes for Kushinagar, showing convergence opportunities where multiple actions can be funded under the same scheme.

| GOVERNMENT SCHEME                                          | MINISTRY                                                                               | FUNDING TYPE     | ACTION CODES | ACTIONS |
|------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------|--------------|---------|
| PMKSY - Per Drop More Crop (PDMC)                          | Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed) | Css              | AA02         | 1       |
| Jal Jeevan Mission (JJM)                                   | Ministry of Jal Shakti                                                                 | Css              | AA03         | 1       |
| PMAY-Gramin / PMAY-Urban                                   | Ministry of Rural Development                                                          | Css              | AA16         | 1       |
| MGNREGA-NRM + PMKSY (Watershed Development)                | Ministry of Rural Development                                                          | Central_Dominant | AA01         | 1       |
| NCRMP Phase II + SDRF                                      | Ministry of Home Affairs                                                               | Central          | AA05         | 1       |
| RKVY-RAFTAAR + National Mission on Sustainable Agriculture | Ministry of Agriculture                                                                | Central          | AA09         | 1       |
| NDMA - National Cyclone Risk Mitigation Project (NCRMP)    | Ministry of Home Affairs                                                               | Central          | AA04         | 1       |

| GOVERNMENT SCHEME                                               | MINISTRY                                         | FUNDING TYPE     | ACTION CODES | ACTIONS |
|-----------------------------------------------------------------|--------------------------------------------------|------------------|--------------|---------|
| AMRUT 2.0 + Smart Cities Mission                                | Ministry of Housing & Urban Affairs              | Css              | AA06         | 1       |
| MGNREGA (NRM component)                                         | Ministry of Rural Development                    | Central_Dominant | AA12         | 1       |
| NDMA Guidelines + 15th Finance Commission DM grants             | N/A                                              | N/A              | AA14         | 1       |
| Pradhan Mantri Fasal Bima Yojana (PMFBY)                        | Ministry of Agriculture                          | Css              | AA10         | 1       |
| NHM + Ayushman Bharat HWC                                       | Ministry of Health & Family Welfare              | Css              | AA11         | 1       |
| DAY-NRLM                                                        | Ministry of Rural Development                    | Css              | AA13         | 1       |
| NDRF Training Academy + SDRF                                    | Ministry of Home Affairs                         | Css              | AA15         | 1       |
| National Plan for Conservation of Aquatic Eco-systems (NPCA)    | N/A                                              | N/A              | AA18         | 1       |
| PMJDY + PMSBY + PMJJBY                                          | N/A                                              | N/A              | AA20         | 1       |
| PM-KUSUM + Rooftop Solar Programme                              | Ministry of New & Renewable Energy               | Css              | AA21         | 1       |
| BharatNet Phase III + Digital India                             | N/A                                              | N/A              | AA22         | 1       |
| Pradhan Mantri Matsya Sampada Yojana (PMMSY)                    | Ministry of Fisheries                            | Css              | AA26         | 1       |
| POSHAN Abhiyaan + NFSA + RKVY                                   | N/A                                              | N/A              | AA31         | 1       |
| National Just Transition Framework (proposed) + PMKVY + MGNREGA | Ministry of Rural Development                    | Central_Dominant | AA33         | 1       |
| RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory             | N/A                                              | N/A              | AA34         | 1       |
| MSME Cluster Development Programme + PM Vishwakarma             | N/A                                              | N/A              | AA19         | 1       |
| PMKVY + PMEGP + DDU-GKY                                         | N/A                                              | N/A              | AA27         | 1       |
| NHM + Ayushman Bharat + BOCW                                    | Ministry of Health & Family Welfare              | Css              | AA30         | 1       |
| PMKVY 4.0 + PMEGP + DDU-GKY                                     | N/A                                              | N/A              | AA32         | 1       |
| Van Dhan Vikas Kendra + CAMPA + Green India Mission             | Ministry of Environment, Forest & Climate Change | Central          | AA35         | 1       |
| Samagra Shiksha + NDMA School Safety                            | N/A                                              | N/A              | AA25         | 1       |
| National Mission on Cultural Heritage + RKVY                    | N/A                                              | N/A              | AA29         | 1       |

## 7.6 Cost-Benefit Analysis Summary

The cost-benefit analysis for Kushinagar's climate action plan estimates the economic return on resilience investment by comparing implementation costs against avoided damage costs and productivity gains.

| PARAMETER                                  | ESTIMATE             | BASIS                                                    |
|--------------------------------------------|----------------------|----------------------------------------------------------|
| <b>Total Investment (5 years)</b>          | Rs 4300 - 19630 Lakh | Capital + O&M + contingency                              |
| <b>Estimated Avoided Damage (10 years)</b> | Rs 49075 Lakh        | Based on historical event damage * probability reduction |
| <b>Agricultural Productivity Gains</b>     | Rs 15704 Lakh        | CSA yield increase + crop loss reduction                 |
| <b>Health Cost Savings</b>                 | Rs 5889 Lakh         | Reduced disease burden, fewer hospitalisations           |
| <b>Estimated Benefit-Cost Ratio</b>        | <b>2.5:1</b>         | Global evidence: adaptation BCR 2-10x (GCA, 2019)        |

**Note:** The Global Commission on Adaptation (2019) found that investing USD 1 in climate adaptation yields USD 2-10 in net economic benefits. The indicative BCR of 2.5:1 presented here is a planning estimate derived from the GCA's global evidence base and should not be treated as a district-specific cost-benefit analysis. A detailed economic appraisal using local damage data and discount rates is recommended before committing public funds. Non-monetary benefits -- including lives saved, ecosystems preserved, and social cohesion maintained -- are not quantified in this estimate.

## 16. Monitoring & Evaluation Framework

### 8.1 SMART Key Performance Indicators

Every action in Kushinagar's climate action plan has a specific, measurable KPI with baseline, year-1, year-3, and year-5 targets.

| CODE | ACTION                                      | BASELINE | Y1 TARGET | Y3 TARGET | Y5 TARGET | RESPONSIBLE                    | FREQUENCY |
|------|---------------------------------------------|----------|-----------|-----------|-----------|--------------------------------|-----------|
| AA02 | Micro-Irrigation Expansion (Drip & Sprin... | 58       | 60        | 63        | 66        | Agriculture Department / Horti | Quarterly |
| AA03 | Jal Jeevan Mission — Tap Water to Every ... | 58       | 60        | 63        | 66        | PHED / Rural Water Supply Dept | Quarterly |
| AA16 | Climate-Resilient Housing (PMAY Upgrades... | 50       | 52        | 56        | 58        | Housing Dept / Municipal/Panch | Quarterly |
| AA01 | Watershed Development & Rainwater Harves... | 58       | 60        | 62        | 64        | District Collector / DRDA / So | Quarterly |
| AA05 | Cyclone Shelters & Evacuation Infrastruc... | 50       | 52        | 55        | 57        | NDMA / State DMA / PWD         | Quarterly |
| AA09 | Climate-Smart Agriculture (CSA) Package...  | 58       | 60        | 62        | 64        | Agriculture Dept / ICAR KVK    | Quarterly |
| AA04 | Flood Forecasting & Early Warning System... | 50       | 52        | 54        | 56        | CWC / IMD / DDMA               | Quarterly |
| AA06 | Urban Stormwater Drainage Upgrades...       | 50       | 52        | 54        | 56        | Municipal Corporation / ULB /  | Quarterly |
| AA12 | MGNREGA-NRM Convergence for Resilience...   | 54       | 56        | 59        | 60        | Block Development Officer / DR | Quarterly |
| AA14 | District Disaster Management Plan (DDMP)... | 34       | 35        | 38        | 40        | District Collector / DDMA      | Quarterly |
| AA10 | Crop Insurance Expansion (PMFBY)...         | 58       | 59        | 61        | 62        | Agriculture Dept / Insurance C | Quarterly |
| AA11 | Climate-Resilient Healthcare Infrastruct... | 50       | 52        | 54        | 55        | Health Dept / NHM              | Quarterly |
| AA13 | SHG-Based Climate Livelihood Diversifica... | 54       | 56        | 58        | 59        | NRLM State Mission / Block Mis | Quarterly |
| AA15 | Community-Based Disaster Response Teams ... | 34       | 35        | 37        | 39        | DDMA / Block Disaster Manageme | Quarterly |
| AA18 | Wetland Restoration & Protection...         | 58       | 59        | 61        | 62        | Wetland Authority / Forest Dep | Quarterly |
| AA20 | Financial Inclusion & Weather-Index Insu... | 54       | 56        | 58        | 59        | Lead District Manager / NABARD | Quarterly |
| AA21 | Solar-Powered Rural Infrastructure...       | 50       | 52        | 54        | 55        | Renewable Energy Agency / DISC | Quarterly |
| AA22 | Digital Connectivity for EWS Disseminati... | 50       | 52        | 54        | 55        | DoT / BharatNet / CSC e-Govern | Quarterly |
| AA26 | Climate-Resilient Inland Fisheries & Aqu... | 54       | 56        | 58        | 59        | Fisheries Department / NFDB    | Quarterly |
| AA31 | Climate-Resilient Nutrition Security (Pu... | 58       | 59        | 61        | 62        | Agriculture Dept / ICDS / WCD  | Quarterly |

## 8.2 M&E Institutional Setup

The M&E framework for Kushinagar's climate action plan is structured at three levels:

| LEVEL                 | RESPONSIBILITY                  | KEY ACTIVITIES                                                                            | REPORTING TO                                         |
|-----------------------|---------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>Block Level</b>    | BDO + Block Climate Coordinator | Track physical/financial progress, collect field data, community feedback                 | District Climate Nodal Officer (monthly)             |
| <b>District Level</b> | Climate Nodal Officer (DPO)     | Compile block reports, analyse KPIs, prepare quarterly reports, coordinate re-assessments | DCC/DDMA (quarterly), State Climate Cell (quarterly) |
| <b>State Level</b>    | State Climate Cell / SDMA       | Aggregate district data, allocate additional resources, policy guidance                   | State Government / NAPCC monitoring (annually)       |

## 8.3 Expected Score Trajectory



### Dimension-wise Score Trajectory

| DIMENSION                            | CURRENT | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL GAIN |
|--------------------------------------|---------|---------|---------|---------|------------|
| Climatic Hazard                      | 76      | 77      | 78      | 79      | +4         |
| Socio-Economic Exposure              | 54      | 55      | 57      | 58      | +4         |
| Ecological Sensitivity               | 58      | 59      | 60      | 61      | +4         |
| Infrastructure Vulnerability         | 50      | 51      | 53      | 54      | +4         |
| Adaptive Capacity                    | 36      | 38      | 40      | 42      | +6         |
| Institutional & Governance Readiness | 34      | 35      | 38      | 39      | +6         |
| Economic Resilience                  | 50      | 51      | 53      | 54      | +4         |

## 8.4 M&E Schedule

| FREQUENCY   | ACTIVITY                                                      | RESPONSIBLE                                | OUTPUT                                     |
|-------------|---------------------------------------------------------------|--------------------------------------------|--------------------------------------------|
| Monthly     | Track scheme utilisation, fund flow, physical progress        | BDO / Project Officer                      | Monthly progress sheet                     |
| Quarterly   | Review KPIs, inter-departmental coordination meeting          | ADM / District Climate Committee           | Quarterly M&E report                       |
| Bi-annually | Re-assess dimension scores using updated indicator data       | District Planning Officer + ResilientPulse | Score update report                        |
| Annually    | Full resilience re-scoring, action plan revision, DDMP update | District Collector / DDMA                  | Annual review report + revised action plan |
| Post-Event  | Rapid damage assessment, plan effectiveness review            | DDMO + all departments                     | Post-event assessment report               |

## 8.5 Quarterly Monitoring Report Template

Template for quarterly progress reporting by the Climate Nodal Officer for Kushinagar.

| QUARTERLY CLIMATE ACTION PLAN MONITORING REPORT -- KUSHINAGAR |                                           |
|---------------------------------------------------------------|-------------------------------------------|
| Reporting Period                                              | Q__ (Month __ to Month __) of Year __     |
| Report Prepared By                                            | Climate Nodal Officer, Kushinagar         |
| Report Submitted To                                           | District Climate Committee / DDMA         |
| Overall Status                                                | On Track / At Risk / Delayed (select one) |
| Actions Completed This Quarter                                | [List action codes and titles]            |
| Actions In Progress                                           | [List with % completion]                  |
| Actions Delayed                                               | [List with reasons and revised timelines] |
| Funds Utilised (Rs Lakh)                                      | This Quarter: __   Cumulative: __         |
| Key Issues & Risks                                            | [Describe issues, proposed mitigation]    |
| Climate Events This Quarter                                   | [Any extreme events, impacts, response]   |
| Recommendations for DCC                                       | [Decisions needed from committee]         |

## 8.6 Climate Indicator Monitoring

In addition to action-level KPIs, the following climate parameters should be monitored to detect emerging risks and trigger plan revisions for Kushinagar.

| CLIMATE PARAMETER             | UNIT                 | EXPECTED TREND                | PLAN REVISION TRIGGER                                     |
|-------------------------------|----------------------|-------------------------------|-----------------------------------------------------------|
| Mean Temperature Anomaly      | deg C above baseline | +0.6 deg C/decade             | Re-assess projections if trend exceeds +1.0 deg C/decade  |
| Extreme Heat Days (>40 deg C) | days/year            | Increasing by 2-3 days/decade | Activate enhanced heat action plan if >50 days/year       |
| Annual Rainfall Deviation     | % from LPA           | +/- 10-15%                    | Trigger drought contingency if deficit >20% by August     |
| Extreme Rainfall Events       | events/year          | Increasing by 1/decade        | Review drainage design if >8 events/year                  |
| Monsoon Onset Date            | Julian day           | Delaying by 2-3 days/decade   | Adjust sowing advisories if onset delayed >15 days        |
| Groundwater Level             | metres below ground  | Declining 0.5-1m/decade       | Restrict extraction if level exceeds safe yield threshold |

If any climate parameter exceeds its plan revision trigger, the District Climate Committee should convene an extraordinary meeting to review the climate action plan for Kushinagar and approve necessary amendments. This adaptive management approach ensures that the plan remains relevant as climate conditions evolve.

## 17. Institutional Framework

### 17.1 District Climate Action Committee (DCAC)

The District Climate Action Committee (DCAC) for Kushinagar is recommended as a sub-committee of the District Disaster Management Authority (DDMA), established under the provisions of the Disaster Management Act, 2005. The DCAC will serve as the apex coordinating body for climate action plan implementation.

#### Composition

| POSITION                | DESIGNATION                                       | ROLE IN DCAC                                                                  |
|-------------------------|---------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Chairperson</b>      | District Collector / District Magistrate          | Overall leadership, inter-departmental coordination, fund allocation approval |
| <b>Vice-Chairperson</b> | ADM (Development) / CEO, Zila Parishad            | Day-to-day coordination, scheme convergence, monitoring                       |
| <b>Member Secretary</b> | District Planning Officer (Climate Nodal Officer) | Data collection, indicator tracking, quarterly reporting, state coordination  |
| <b>Member</b>           | District Agriculture Officer                      | CSA implementation, crop planning, PMFBY coordination                         |
| <b>Member</b>           | Executive Engineer, Irrigation / PHED             | Watershed, irrigation, JJM water supply                                       |
| <b>Member</b>           | Chief Medical Officer / DHO                       | Heat action plan, disease surveillance, PHC climate-proofing                  |
| <b>Member</b>           | Executive Engineer, PWD                           | Road, building, and drainage infrastructure resilience                        |
| <b>Member</b>           | Divisional Forest Officer                         | Forest restoration, wetland protection, CAMPA utilisation                     |
| <b>Member</b>           | DRDA Project Director / BDO (lead block)          | Livelihood programmes, SHG mobilisation, MGNREGA-NRM                          |
| <b>Member</b>           | District Disaster Management Officer              | EWS, CBDRT, DDMP, emergency response                                          |
| <b>Member</b>           | Lead District Manager (LDM)                       | Credit flow, insurance products, financial inclusion                          |
| <b>Invitee</b>          | Elected representatives (MP/MLA)                  | Political support, advocacy, MPLADS convergence                               |
| <b>Invitee</b>          | Civil society / NGO representative                | Community perspective, technical support                                      |

#### Terms of Reference

The DCAC for Kushinagar shall: (1) Review and approve the climate action plan and annual updates; (2) Ensure inter-departmental coordination for plan implementation; (3) Review quarterly progress reports and address bottlenecks; (4) Approve fund allocation and scheme convergence proposals; (5) Respond to climate emergencies by convening extraordinary meetings; (6) Report progress to the State Climate Cell / SDMA quarterly.

#### Meeting Schedule

| MEETING TYPE                    | FREQUENCY       | CHAired BY         | KEY AGENDA                                              |
|---------------------------------|-----------------|--------------------|---------------------------------------------------------|
| <b>Full DCAC Meeting</b>        | Quarterly       | District Collector | Progress review, fund allocation, policy decisions      |
| <b>Technical Sub-Committee</b>  | Monthly         | ADM (Development)  | Implementation coordination, bottleneck resolution      |
| <b>Pre-Monsoon Preparedness</b> | Annual (April)  | District Collector | Readiness review, EWS testing, resource pre-positioning |
| <b>Emergency Session</b>        | Event-triggered | District Collector | Disaster response, damage assessment, plan revision     |

## 17.2 Agency Responsibility Matrix (RACI)

R = Responsible (implements), A = Accountable (approves), C = Consulted (provides input), I = Informed (receives updates). Shown for top 15 actions in Kushinagar's plan.

| CODE | ACTION                                  | R (DEPT)                       | A (OFFICER)        | C                                | I                         |
|------|-----------------------------------------|--------------------------------|--------------------|----------------------------------|---------------------------|
| AA02 | Micro-Irrigation Expansion (Drip & ...  | Agriculture Department / Horti | District Collector | Agriculture & Food Security Dept | DDMA / State Climate Cell |
| AA03 | Jal Jeevan Mission — Tap Water to E...  | PHED / Rural Water Supply Dept | District Collector | Water Security Dept              | DDMA / State Climate Cell |
| AA16 | Climate-Resilient Housing (PMAY Upg...  | Housing Dept / Municipal/Panch | District Collector | Infrastructure Dept              | DDMA / State Climate Cell |
| AA01 | Watershed Development & Rainwater H...  | District Collector / DRDA / So | District Collector | Water Security Dept              | DDMA / State Climate Cell |
| AA05 | Cyclone Shelters & Evacuation Infra...  | NDMA / State DMA / PWD         | District Collector | Infrastructure Dept              | DDMA / State Climate Cell |
| AA09 | Climate-Smart Agriculture (CSA) Pac...  | Agriculture Dept / ICAR KVK    | District Collector | Agriculture & Food Security Dept | DDMA / State Climate Cell |
| AA04 | Flood Forecasting & Early Warning S...  | CWC / IMD / DDMA               | District Collector | Infrastructure Dept              | DDMA / State Climate Cell |
| AA06 | Urban Stormwater Drainage Upgrades...   | Municipal Corporation / ULB /  | District Collector | Urban Resilience Dept            | DDMA / State Climate Cell |
| AA12 | MGNREGA-NRM Convergence for Resilie...  | Block Development Officer / DR | District Collector | Livelihoods & Skills Dept        | DDMA / State Climate Cell |
| AA14 | District Disaster Management Plan (...) | District Collector / DDMA      | District Collector | Governance & Institutions Dept   | DDMA / State Climate Cell |
| AA10 | Crop Insurance Expansion (PMFBY)...     | Agriculture Dept / Insurance C | District Collector | Agriculture & Food Security Dept | DDMA / State Climate Cell |
| AA11 | Climate-Resilient Healthcare Infras...  | Health Dept / NHM              | District Collector | Public Health Dept               | DDMA / State Climate Cell |
| AA13 | SHG-Based Climate Livelihood Divers...  | NRLM State Mission / Block Mis | District Collector | Livelihoods & Skills Dept        | DDMA / State Climate Cell |
| AA15 | Community-Based Disaster Response T...  | DDMA / Block Disaster Manageme | District Collector | Governance & Institutions Dept   | DDMA / State Climate Cell |
| AA18 | Wetland Restoration & Protection...     | Wetland Authority / Forest Dep | District Collector | Ecosystem & Biodiversity Dept    | DDMA / State Climate Cell |

### 17.3 State-District Coordination

Kushinagar's climate action plan must align with and contribute to Uttar Pradesh's State Action Plan on Climate Change (SAPCC). The following coordination mechanisms ensure vertical integration:

| MECHANISM                           | DESCRIPTION                                                                                                                            | FREQUENCY             |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>SAPCC Alignment</b>              | All district actions aligned with Uttar Pradesh SAPCC missions and targets. District progress feeds into state-level SAPCC monitoring. | Ongoing               |
| <b>State Climate Cell Reporting</b> | Quarterly submission of district climate action progress reports to the State Climate Cell through the Climate Nodal Officer.          | Quarterly             |
| <b>SDMA Coordination</b>            | District-level disaster preparedness and response aligned with SDMA guidelines. Post-event reports submitted to SDMA.                  | Event-triggered       |
| <b>State Climate Funds Access</b>   | District proposals for state-level climate adaptation funds channelled through DPO to State Planning Department.                       | Annual (budget cycle) |
| <b>Inter-District Learning</b>      | Participation in state-level climate resilience workshops, sharing of best practices with neighbouring districts.                      | Bi-annual             |

### 17.4 Community Engagement

Effective climate action in Kushinagar requires deep community engagement at the grassroots level. The following community engagement mechanisms are recommended:

| MECHANISM                               | DESCRIPTION                                                                                                                                                            | SCALE                 |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Panchayat Climate Sub-Committees</b> | Each gram panchayat to form a climate sub-committee that identifies local vulnerabilities, monitors implementation, and provides feedback to block-level officers.     | All gram panchayats   |
| <b>Community Climate Clubs</b>          | Youth-led climate clubs in colleges and schools for awareness, citizen science (rainfall measurement, biodiversity surveys), and community-based monitoring.           | 10-20 institutions    |
| <b>School Climate Education</b>         | Integration of local climate resilience into school curricula through eco-clubs, poster competitions, and experiential learning (school garden, rainwater harvesting). | All secondary schools |
| <b>SHG Climate Champions</b>            | Train one member per SHG as a climate champion who disseminates information on weather advisories, crop insurance, and adaptation practices.                           | All active SHGs       |
| <b>Citizen Science Network</b>          | Community volunteers trained in basic weather observation (rain gauge reading, temperature recording) to supplement official monitoring data.                          | 50-100 volunteers     |

#### 17.4.1 Block-Level Climate Action Structure

Each block within Kushinagar should establish the following institutional structure to ensure climate action reaches the last mile:

| ROLE                                                    | RESPONSIBILITY                                                                                                                           | REPORTS TO                                        |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>Block Development Officer (BDO)</b>                  | Overall coordination of climate action at block level; chairs Block Climate Committee; ensures scheme convergence                        | ADM / District Climate Nodal Officer              |
| <b>Block Climate Coordinator</b>                        | Dedicated officer (can be existing Block Programme Officer) for tracking KPIs, compiling monthly progress, coordinating line departments | BDO + District Climate Nodal Officer              |
| <b>Block Agriculture Officer</b>                        | Climate-smart agriculture implementation, crop advisories, PMFBY/PMKSY/SHC scheme execution at block level                               | BDO + District Agriculture Officer                |
| <b>GP-Level Climate Champions</b>                       | 1 trained volunteer per gram panchayat: community mobilisation, EWS dissemination, local monitoring, feedback loop                       | Block Climate Coordinator                         |
| <b>Community-Based Disaster Response Teams (CBDRTs)</b> | 15-20 members per block trained in search & rescue, first aid, early warning, evacuation route management                                | BDPO / DDMA via Block Emergency Operations Centre |

## 17.5 Capacity Building Plan

Effective implementation of Kushinagar's climate action plan requires building climate literacy and technical skills across district administration, line departments, and community stakeholders.

| TARGET GROUP                         | TRAINING NEED                                                                                | DURATION                 | PROVIDER                                 |
|--------------------------------------|----------------------------------------------------------------------------------------------|--------------------------|------------------------------------------|
| <b>District Collector &amp; ADMs</b> | Climate science fundamentals, CRI interpretation, climate-informed decision-making           | 1-day orientation        | NIDM / State ATI / ResilientPulse        |
| <b>Climate Nodal Officer (DPO)</b>   | CRI methodology, M&E framework, data collection and analysis, report writing                 | 3-day intensive          | NIDM / IITM Pune / ResilientPulse        |
| <b>Line Department Heads</b>         | Sector-specific climate risks and adaptation options, scheme convergence                     | 2-day workshop           | State ATI / Domain experts               |
| <b>BDOs &amp; Block Staff</b>        | Block-level climate vulnerability mapping, action plan implementation, field monitoring      | 2-day workshop           | District administration + ResilientPulse |
| <b>CBDRT Members</b>                 | First aid, search & rescue, early warning dissemination, damage assessment                   | 3-day + annual refresher | SDMA / DDMA / Red Cross                  |
| <b>Farmers / SHG Members</b>         | Climate-smart agriculture practices, weather advisory interpretation, crop insurance         | Field-level training     | KVK / Agriculture Dept / CSA experts     |
| <b>Health Workers (ANMs, ASHAs)</b>  | Heat-related illness recognition, waterborne disease prevention, climate-health surveillance | 1-day training           | CMO / NHM / Health Dept                  |

The total capacity building investment for Kushinagar is estimated at Rs 10-15 Lakh over the first two years, leveraging existing training infrastructure (State ATI, KVKs, NIDM) to minimise costs. Annual refresher training should be budgeted at Rs 3-5 Lakh/year from Year 3 onwards.

## Annexures

### Annexure A: Complete Indicator Data

Full 75-indicator dataset for Kushinagar with estimated scores, national averages, gap analysis, data sources, and reference years. Negative gaps (red) indicate areas where the district falls below the national average. This table provides the complete analytical basis for the recommendations in Sections 5-9 of this DCAP.

| CODE | INDICATOR                                            | DIMENSION            | SCORE | NATL AVG | GAP | SOURCE                           | YEAR |
|------|------------------------------------------------------|----------------------|-------|----------|-----|----------------------------------|------|
| CH01 | Mean Temperature Anomaly                             | Climatic Hazard      | 73    | 50       | +23 | NASA POWER + ERA5                | 2024 |
| CH02 | Extreme Heat Days (Tmax > 40°C)                      | Climatic Hazard      | 73    | 43       | +30 | NASA POWER                       | 2024 |
| CH03 | Heat Wave Frequency                                  | Climatic Hazard      | 78    | 57       | +21 | IMD Gridded                      | 2024 |
| CH04 | Annual Rainfall Deviation from LPA                   | Climatic Hazard      | 66    | 40       | +26 | IMD Gridded Rainfall             | 2024 |
| CH05 | Extreme Rainfall Events (>115.6mm/day)               | Climatic Hazard      | 84    | 58       | +26 | IMD Gridded                      | 2024 |
| CH06 | Consecutive Dry Days (Maximum Spell)                 | Climatic Hazard      | 68    | 50       | +18 | ERA5 / IMD                       | 2024 |
| CH07 | Drought Frequency (SPI < -1.5)                       | Climatic Hazard      | 71    | 59       | +12 | SPI computed from IMD rainfall   | 2024 |
| CH08 | Flood Frequency (Historical)                         | Climatic Hazard      | 81    | 50       | +31 | CWC + NDMA + EM-DAT              | 2024 |
| CH09 | Cyclone Track Density                                | Climatic Hazard      | 83    | 55       | +28 | NOAA IBTrACS v4                  | 2024 |
| CH10 | Sea Level Rise Exposure                              | Climatic Hazard      | 82    | 50       | +32 | AVISO satellite altimetry        | 2023 |
| CH11 | Landslide Susceptibility                             | Climatic Hazard      | 81    | 47       | +34 | GSI + ISRO NRSC                  | 2020 |
| CH12 | Seismic Zone Classification                          | Geophysical Hazard   | 41    | 51       | -10 | BIS IS-1893                      | 2022 |
| CH13 | Monsoon Onset Delay                                  | Climatic Hazard      | 74    | 46       | +28 | IMD Monsoon Reports              | 2024 |
| CH14 | Heat Wave Duration (Maximum Consecutive Days)        | Climatic Hazard      | 70    | 58       | +12 | IMD Gridded / NASA POWER         | 2024 |
| SE01 | Population Density                                   | Socioeconomic Exposu | 60    | 46       | +14 | Census 2011                      | 2011 |
| SE02 | Population in Flood-Prone Areas                      | Socioeconomic Exposu | 56    | 54       | +2  | CWC flood maps + Census          | 2020 |
| SE03 | Agricultural Workers (% of Workforce)                | Socioeconomic Exposu | 46    | 54       | -8  | Census 2011                      | 2011 |
| SE04 | Rainfed Agricultural Area                            | Socioeconomic Exposu | 44    | 55       | -11 | Agricultural Census 2015-16      | 2016 |
| SE05 | BPL Households                                       | Socioeconomic Exposu | 62    | 41       | +21 | SECC 2011                        | 2011 |
| SE06 | SC/ST Population                                     | Socioeconomic Exposu | 60    | 42       | +18 | Census 2011                      | 2011 |
| SE07 | Child Population (0-6 years)                         | Socioeconomic Exposu | 63    | 41       | +22 | Census 2011                      | 2011 |
| SE08 | Elderly Population (60+)                             | Socioeconomic Exposu | 55    | 50       | +5  | Census 2011                      | 2011 |
| SE09 | Female-Headed Households                             | Socioeconomic Exposu | 54    | 55       | -1  | Census 2011                      | 2011 |
| SE10 | Slum Population                                      | Socioeconomic Exposu | 63    | 54       | +9  | Census 2011                      | 2011 |
| SE11 | Female Agricultural & Casual Labor Share             | Socioeconomic Exposu | 63    | 48       | +15 | Census 2011 / PLFS               | 2011 |
| SE12 | Women's Land Ownership                               | Socioeconomic Exposu | 46    | 51       | -5  | Agricultural Census 2015-16      | 2016 |
| ES01 | Forest Cover Change (2011-2021)                      | Ecological Sensitivi | 66    | 47       | +18 | FSI ISFR                         | 2021 |
| ES02 | Wetland Area Loss                                    | Ecological Sensitivi | 56    | 51       | +6  | NRSC National Wetland Atlas      | 2019 |
| ES03 | Groundwater Depletion Stage                          | Ecological Sensitivi | 58    | 41       | +16 | CGWB Dynamic Assessment          | 2023 |
| ES04 | Soil Erosion Rate                                    | Ecological Sensitivi | 62    | 59       | +2  | NBSS&LUP / ICAR                  | 2018 |
| ES05 | Vegetation Stability (NDVI Coefficient of Variation) | Ecological Sensitivi | 58    | 51       | +6  | MODIS NDVI (NASA)                | 2024 |
| ES06 | Desertification/Land Degradation Area                | Ecological Sensitivi | 58    | 43       | +14 | ISRO SAC Desertification Atlas   | 2018 |
| ES07 | Mangrove Cover (Coastal Districts)                   | Ecological Sensitivi | 62    | 57       | +4  | FSI ISFR                         | 2021 |
| ES08 | Biodiversity Hotspot Overlap                         | Ecological Sensitivi | 56    | 53       | +2  | IUCN + WII                       | 2020 |
| ES09 | Coastal Groundwater Salinity                         | Ecological Sensitivi | 64    | 42       | +22 | CGWB / State Groundwater Reports | 2023 |
| IV01 | Kutcha + Semi-Pucca Houses                           | Infrastructure Vulne | 51    | 44       | +7  | Census 2011 (Houselisting)       | 2011 |
| IV02 | Road Density                                         | Infrastructure Vulne | 50    | 43       | +7  | PMGSY + NHAI                     | 2023 |
| IV03 | Power Supply Disruption Frequency                    | Infrastructure Vulne | 47    | 55       | -8  | CEA / DISCOM data                | 2023 |
| IV04 | Drinking Water Source Vulnerability                  | Infrastructure Vulne | 56    | 58       | -2  | Census 2011 / JJM                | 2024 |
| IV05 | Healthcare Facility Density                          | Infrastructure Vulne | 52    | 59       | -7  | NHM HMIS                         | 2024 |
| IV06 | School Infrastructure at Risk                        | Infrastructure Vulne | 50    | 59       | -9  | UDISE + hazard overlay           | 2023 |
| IV07 | Telecom Connectivity                                 | Infrastructure Vulne | 53    | 42       | +11 | TRAI                             | 2024 |

| CODE | INDICATOR                                         | DIMENSION            | SCORE | NATL AVG | GAP | SOURCE                                        | YEAR |
|------|---------------------------------------------------|----------------------|-------|----------|-----|-----------------------------------------------|------|
| IV08 | Formal Drainage Coverage                          | Infrastructure Vulne | 44    | 46       | -2  | Census 2011                                   | 2011 |
| AC01 | Literacy Rate                                     | Adaptive Capacity    | 37    | 51       | -14 | Census 2011                                   | 2011 |
| AC02 | Female Literacy Rate                              | Adaptive Capacity    | 34    | 52       | -18 | Census 2011                                   | 2011 |
| AC03 | Irrigated Area                                    | Adaptive Capacity    | 34    | 42       | -8  | Agricultural Census / Minor Irrigation Census | 2016 |
| AC04 | Tap Water Coverage (FHTC)                         | Adaptive Capacity    | 27    | 48       | -21 | Jal Jeevan Mission Dashboard                  | 2026 |
| AC05 | Banking Penetration                               | Adaptive Capacity    | 39    | 57       | -18 | RBI Financial Inclusion data                  | 2023 |
| AC06 | Crop Insurance Coverage (PMFBY)                   | Adaptive Capacity    | 45    | 51       | -6  | PMFBY Dashboard                               | 2024 |
| AC07 | MGNREGA Person-Days per Household                 | Adaptive Capacity    | 28    | 51       | -23 | MGNREGA MIS                                   | 2025 |
| AC08 | SHG Density                                       | Adaptive Capacity    | 32    | 50       | -18 | NRLM MIS                                      | 2024 |
| AC09 | Internet Subscribers per 100                      | Adaptive Capacity    | 43    | 42       | +1  | TRAI Quarterly Data                           | 2024 |
| AC10 | Renewable Energy Capacity per Capita              | Adaptive Capacity    | 37    | 57       | -20 | MNRE                                          | 2024 |
| AC11 | Forest Rights Titles (FRA)                        | Adaptive Capacity    | 33    | 59       | -26 | MoTA / Tribal Affairs                         | 2023 |
| AC12 | Disaster Risk Insurance Penetration               | Adaptive Capacity    | 31    | 56       | -25 | IRDAI + State data                            | 2023 |
| GR01 | DDMP Currency (District Disaster Management Plan) | Governance Readiness | 39    | 54       | -15 | NDMA / DDMA websites                          | 2024 |
| GR02 | SAPCC Implementation Status                       | Governance Readiness | 36    | 51       | -15 | MoEFCC                                        | 2024 |
| GR03 | GPDP Climate Component                            | Governance Readiness | 38    | 56       | -18 | eGramSwaraj                                   | 2024 |
| GR04 | Convergence Spending (Climate-related)            | Governance Readiness | 31    | 50       | -19 | MGNREGA + DRF + CAMPA MIS                     | 2024 |
| GR05 | Early Warning System Coverage                     | Governance Readiness | 33    | 57       | -24 | IMD + CWC + NDMA                              | 2024 |
| GR06 | Disaster Response Force Availability              | Governance Readiness | 36    | 42       | -6  | SDRF/NDRF                                     | 2024 |
| GR07 | Climate-Smart Agriculture Adoption                | Governance Readiness | 33    | 50       | -17 | ICAR KVK MIS                                  | 2024 |
| GR08 | Urban Climate Action (AMRUT/Smart City)           | Governance Readiness | 32    | 58       | -26 | MoHUA                                         | 2024 |
| GR09 | Watershed Committee Functionality                 | Governance Readiness | 32    | 46       | -14 | WRIS / State data                             | 2024 |
| GR10 | SDG India Index Score (NITI Aayog)                | Governance Readiness | 34    | 45       | -11 | NITI Aayog SDG India Portal                   | 2024 |
| GR11 | Gender-Disaggregated DRR Training Completion      | Governance Readiness | 32    | 52       | -20 | NDMA / State DMA Training Records             | 2024 |
| ER01 | District GDP per Capita                           | Economic Resilience  | 44    | 42       | +2  | MoSPI / State GSDP estimates                  | 2023 |
| ER02 | Economic Diversification (Herfindahl Index)       | Economic Resilience  | 51    | 56       | -5  | Census workforce tables                       | 2011 |
| ER03 | Savings Rate (Bank Deposits per Capita)           | Economic Resilience  | 58    | 53       | +5  | RBI District Banking Statistics               | 2023 |
| ER04 | MSME Density                                      | Economic Resilience  | 53    | 49       | +4  | MSME Udyam Registration                       | 2024 |
| ER05 | Crop Diversification Index                        | Economic Resilience  | 51    | 51       | +0  | Agricultural Census                           | 2016 |
| ER06 | Remittance Dependency                             | Economic Resilience  | 44    | 52       | -8  | Census migration tables                       | 2011 |
| ER07 | Local Body Fiscal Health                          | Economic Resilience  | 52    | 50       | +2  | State Finance Commission data                 | 2022 |
| ER08 | Credit-Deposit Ratio                              | Economic Resilience  | 49    | 40       | +9  | RBI District Banking Statistics               | 2023 |
| ER09 | Coal Sector Employment Dependency                 | Economic Resilience  | 56    | 46       | +10 | Census 2011 / Coal Ministry                   | 2023 |

Note: Scores are modelled estimates based on dimension-level data. Individual indicator values should be validated with local ground-truth data before use in formal planning documents. National averages are based on the 594-district analysis.

## Annexure B: Government Schemes Directory

Complete directory of all 29 adaptation actions mapped to government schemes in Kushinagar's climate action plan. Includes responsible ministries, funding type, eligibility criteria, and portal URLs. QR codes are provided for the top 10 schemes for quick mobile access.

| CODE | ACTION                                            | SECTOR                      | SCHEME                            | MINISTRY                                                                               | FUNDING | ELIGIBILITY            | PORTAL                                                                        | QR                                                                                    |
|------|---------------------------------------------------|-----------------------------|-----------------------------------|----------------------------------------------------------------------------------------|---------|------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| AA02 | Micro-Irrigation Expansion (Drip & Sprinkler)     | Agriculture & Food Security | PMKSY - Per Drop More Crop (PDMC) | Ministry of Agriculture & Farmers' Welfare (PDMC) / Ministry of Jal Shakti (Watershed) | Css     | All eligible districts | <a href="https://pmksy.gov.in">https://pmksy.gov.in</a>                       |    |
| AA03 | Jal Jeevan Mission — Tap Water to Every Household | Water Security              | Jal Jeevan Mission (JJM)          | Ministry of Jal Shakti                                                                 | Css     | All eligible districts | <a href="https://jaljeevanmission.gov.in">https://jaljeevanmission.gov.in</a> |   |
| AA16 | Climate-Resilient Housing (PMAY Upgrades)         | Infrastructure              | PMAY- Gramin / PMAY-Urban         | Ministry of Rural Development                                                          | Css     | All eligible districts | <a href="https://pmayg.nic.in">https://pmayg.nic.in</a>                       |  |

| CODE | ACTION                                       | SECTOR         | SCHEME                                      | MINISTRY                      | FUNDING          | ELIGIBILITY            | PORTAL                                                  | QR                                                                                  |
|------|----------------------------------------------|----------------|---------------------------------------------|-------------------------------|------------------|------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|
| AA01 | Watershed Development & Rainwater Harvesting | Water Security | MGNREGA-NRM + PMKSY (Watershed Development) | Ministry of Rural Development | Central_Dominant | All eligible districts | <a href="https://nrega.nic.in">https://nrega.nic.in</a> |  |

|      |                                              |                |                       |                          |         |                        |                                                         |                                                                                      |
|------|----------------------------------------------|----------------|-----------------------|--------------------------|---------|------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------|
| AA05 | Cyclone Shelters & Evacuation Infrastructure | Infrastructure | NCRMP Phase II + SDRF | Ministry of Home Affairs | Central | All eligible districts | <a href="https://ncrmp.gov.in">https://ncrmp.gov.in</a> |  |
|------|----------------------------------------------|----------------|-----------------------|--------------------------|---------|------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------|

|      |                                         |                             |                                                            |                         |         |                        |                                                               |                                                                                       |
|------|-----------------------------------------|-----------------------------|------------------------------------------------------------|-------------------------|---------|------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------|
| AA09 | Climate-Smart Agriculture (CSA) Package | Agriculture & Food Security | RKVY-RAFTAAR + National Mission on Sustainable Agriculture | Ministry of Agriculture | Central | All eligible districts | <a href="https://nmsa.dac.gov.in">https://nmsa.dac.gov.in</a> |  |
|------|-----------------------------------------|-----------------------------|------------------------------------------------------------|-------------------------|---------|------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------|

|      |                                           |                |                                                         |                          |         |                        |                                                         |                                                                                       |
|------|-------------------------------------------|----------------|---------------------------------------------------------|--------------------------|---------|------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|
| AA04 | Flood Forecasting & Early Warning Systems | Infrastructure | NDMA - National Cyclone Risk Mitigation Project (NCRMP) | Ministry of Home Affairs | Central | All eligible districts | <a href="https://ncrmp.gov.in">https://ncrmp.gov.in</a> |  |
|------|-------------------------------------------|----------------|---------------------------------------------------------|--------------------------|---------|------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|

| CODE | ACTION                                          | SECTOR                      | SCHEME                                              | MINISTRY                            | FUNDING          | ELIGIBILITY            | PORTAL                                                  | QR                                                                                    |
|------|-------------------------------------------------|-----------------------------|-----------------------------------------------------|-------------------------------------|------------------|------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|
| AA06 | Urban Stormwater Drainage Upgrades              | Urban Resilience            | AMRUT 2.0 + Smart Cities Mission                    | Ministry of Housing & Urban Affairs | Css              | All eligible districts | <a href="https://amrut.gov.in">https://amrut.gov.in</a> |    |
| AA12 | MGNREGA-NRM Convergence for Resilience          | Livelihoods & Skills        | MGNREGA (NRM component)                             | Ministry of Rural Development       | Central_Dominant | All eligible districts | <a href="https://nrega.nic.in">https://nrega.nic.in</a> |   |
| AA14 | District Disaster Management Plan (DDMP) Update | Governance & Institutions   | NDMA Guidelines + 15th Finance Commission DM grants | N/A                                 | N/A              | All eligible districts | <a href="https://ndma.gov.in">https://ndma.gov.in</a>   |  |
| AA10 | Crop Insurance Expansion (PMFBY)                | Agriculture & Food Security | Pradhan Mantri Fasal Bima Yojana (PMFBY)            | Ministry of Agriculture             | Css              | All eligible districts | <a href="https://pmfby.gov.in">https://pmfby.gov.in</a> |                                                                                       |
| AA11 | Climate-Resilient Healthcare Infrastructure     | Public Health               | NHM + Ayushman Bharat HWC                           | Ministry of Health & Family Welfare | Css              | All eligible districts | <a href="https://nhm.gov.in">https://nhm.gov.in</a>     |                                                                                       |
| AA13 | SHG-Based Climate Livelihood Diversification    | Livelihoods & Skills        | DAY-NRLM                                            | Ministry of Rural Development       | Css              | All eligible districts | <a href="https://nrml.gov.in">https://nrml.gov.in</a>   |                                                                                       |
| AA15 | Community-Based Disaster Response Teams (CBDRT) | Governance & Institutions   | NDRF Training Academy + SDRF                        | Ministry of Home Affairs            | Css              | All eligible districts | <a href="https://ndma.gov.in">https://ndma.gov.in</a>   |                                                                                       |

| CODE | ACTION                                                                       | SECTOR                      | SCHEME                                                          | MINISTRY                                         | FUNDING          | ELIGIBILITY            | PORTAL                                                                            | QR |
|------|------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------|--------------------------------------------------|------------------|------------------------|-----------------------------------------------------------------------------------|----|
| AA18 | Wetland Restoration & Protection                                             | Ecosystem & Biodiversity    | National Plan for Conservation of Aquatic Eco-systems (NPCA)    | N/A                                              | N/A              | All eligible districts | <a href="https://moef.gov.in">https://moef.gov.in</a>                             |    |
| AA20 | Financial Inclusion & Weather-Index Insurance                                | Economic Resilience         | PMJDY + PMSBY + PMJJBY                                          | N/A                                              | N/A              | All eligible districts | <a href="https://pmjdy.gov.in">https://pmjdy.gov.in</a>                           |    |
| AA21 | Solar-Powered Rural Infrastructure                                           | Infrastructure              | PM-KUSUM + Rooftop Solar Programme                              | Ministry of New & Renewable Energy               | Css              | All eligible districts | <a href="https://mnre.gov.in/solar/schemes">https://mnre.gov.in/solar/schemes</a> |    |
| AA22 | Digital Connectivity for EWS Dissemination                                   | Infrastructure              | BharatNet Phase III + Digital India                             | N/A                                              | N/A              | All eligible districts | <a href="https://bharatnet.gov.in">https://bharatnet.gov.in</a>                   |    |
| AA26 | Climate-Resilient Inland Fisheries & Aquaculture                             | Livelihoods & Skills        | Pradhan Mantri Matsya Sampada Yojana (PMMSY)                    | Ministry of Fisheries                            | Css              | All eligible districts | <a href="https://pmmsy.dof.gov.in">https://pmmsy.dof.gov.in</a>                   |    |
| AA31 | Climate-Resilient Nutrition Security (Pulses, Small Livestock, Home Gardens) | Agriculture & Food Security | POSHAN Abhiyaan + NFSA + RKVY                                   | N/A                                              | N/A              | All eligible districts | <a href="https://poshanabhiyaan.gov.in">https://poshanabhiyaan.gov.in</a>         |    |
| AA33 | Just Transition Support for Coal-Dependent Districts                         | Economic Resilience         | National Just Transition Framework (proposed) + PMKVY + MGNREGA | Ministry of Rural Development                    | Central_Dominant | All eligible districts | <a href="https://nrega.nic.in">https://nrega.nic.in</a>                           |    |
| AA34 | Monsoon-Adaptive Crop Calendar & Seed Variety Management                     | Agriculture & Food Security | RKVY-RAFTAAR + KVK Extension + IMD Agromet Advisory             | N/A                                              | N/A              | All eligible districts | <a href="https://rkvy.nic.in">https://rkvy.nic.in</a>                             |    |
| AA19 | Climate-Resilient MSME Cluster Development                                   | Economic Resilience         | MSME Cluster Development Programme + PM Vishwakarma             | N/A                                              | N/A              | All eligible districts | <a href="https://msme.gov.in">https://msme.gov.in</a>                             |    |
| AA27 | Managed Migration Pathways & Seasonal Livelihood Hubs                        | Livelihoods & Skills        | PMKVY + PMEGP + DDU-GKY                                         | N/A                                              | N/A              | All eligible districts | <a href="https://pmkvyofficial.org">https://pmkvyofficial.org</a>                 |    |
| AA30 | Occupational Health & Climate-Safe Work Standards for Women                  | Public Health               | NHM + Ayushman Bharat + BOCW                                    | Ministry of Health & Family Welfare              | Css              | All eligible districts | <a href="https://nhm.gov.in">https://nhm.gov.in</a>                               |    |
| AA32 | Climate-Aligned Skill Development & Green Jobs                               | Livelihoods & Skills        | PMKVY 4.0 + PMEGP + DDU-GKY                                     | N/A                                              | N/A              | All eligible districts | <a href="https://pmkvyofficial.org">https://pmkvyofficial.org</a>                 |    |
| AA35 | Climate-Resilient NTFP Production & Value Chains                             | Livelihoods & Skills        | Van Dhan Vikas Kendra + CAMPA + Green India Mission             | Ministry of Environment, Forest & Climate Change | Central          | All eligible districts | <a href="https://moef.gov.in">https://moef.gov.in</a>                             |    |
| AA25 | Climate Literacy & School Disaster Preparedness                              | Governance & Institutions   | Samagra Shiksha + NDMA School Safety                            | N/A                                              | N/A              | All eligible districts | <a href="https://samagra.education.gov.in">https://samagra.education.gov.in</a>   |    |

| CODE | ACTION                                                  | SECTOR                    | SCHEME                                       | MINISTRY | FUNDING | ELIGIBILITY            | PORTAL                                                    | QR |
|------|---------------------------------------------------------|---------------------------|----------------------------------------------|----------|---------|------------------------|-----------------------------------------------------------|----|
| AA29 | Indigenous Climate Knowledge Codification & Integration | Governance & Institutions | National Mission on Cultural Heritage + RKVY | N/A      | N/A     | All eligible districts | <a href="https://tribal.nic.in">https://tribal.nic.in</a> |    |

## Annexure C: Climate Data Tables (2015-2024)

10-year climate data summary for Kushinagar based on gridded observations from IMD, NASA POWER, and ERA5 Reanalysis. Values represent modelled estimates for the grid cell containing Kushinagar and should be cross-referenced with local station data.

### C.1 Temperature Data (deg C)

| YEAR | JAN-MAR | APR-JUN | JUL-SEP | OCT-DEC | ANNUAL MEAN |
|------|---------|---------|---------|---------|-------------|
| 2015 | 18.5    | 34.1    | 28.7    | 20.3    | 25.4        |
| 2016 | 18.2    | 33.2    | 30.0    | 20.0    | 25.4        |
| 2017 | 17.3    | 33.1    | 29.7    | 20.9    | 25.3        |
| 2018 | 17.9    | 32.3    | 29.5    | 19.5    | 24.8        |
| 2019 | 19.0    | 32.2    | 28.6    | 20.0    | 24.9        |
| 2020 | 18.0    | 34.0    | 28.4    | 20.6    | 25.2        |
| 2021 | 18.4    | 32.4    | 29.4    | 21.2    | 25.4        |
| 2022 | 18.3    | 33.5    | 28.7    | 20.1    | 25.2        |
| 2023 | 17.8    | 32.4    | 29.4    | 19.4    | 24.7        |
| 2024 | 18.8    | 32.6    | 29.8    | 20.8    | 25.5        |

### C.2 Rainfall Data (mm)

| YEAR | JAN-MAR | APR-JUN | JUL-SEP | OCT-DEC | ANNUAL TOTAL |
|------|---------|---------|---------|---------|--------------|
| 2015 | 50      | 252     | 554     | 151     | 1007         |
| 2016 | 50      | 249     | 549     | 150     | 998          |
| 2017 | 51      | 254     | 559     | 152     | 1017         |
| 2018 | 45      | 226     | 496     | 135     | 902          |
| 2019 | 43      | 216     | 475     | 130     | 864          |
| 2020 | 50      | 252     | 554     | 151     | 1007         |
| 2021 | 49      | 245     | 538     | 147     | 978          |
| 2022 | 51      | 256     | 564     | 154     | 1026         |
| 2023 | 42      | 211     | 465     | 127     | 846          |
| 2024 | 49      | 245     | 538     | 147     | 978          |

Source: IMD Gridded Rainfall (0.25 deg resolution), NASA POWER, ERA5 Reanalysis (0.25 deg). Climate zone: Sub Humid. Monsoon type: Southwest Monsoon (JJAS).

## Annexure D: Regulatory Framework

Key environmental, disaster management, and climate-related legislation applicable to climate action planning in Kushinagar, Uttar Pradesh. This regulatory framework provides the legal basis for the interventions recommended in this DCAP.

| ACT / POLICY                                        | YEAR                | RELEVANCE TO KUSHINAGAR                                                                                                                                                                                                                      |
|-----------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environment (Protection) Act                        | 1986                | Umbrella legislation for environmental protection; enables climate-related regulations, emission standards, and environmental impact assessment requirements applicable to all development activities in the district.                       |
| National Disaster Management Act                    | 2005                | Establishes NDMA, SDMA, and DDMA structure; mandates District Disaster Management Plans (DDMP); provides legal framework for disaster preparedness, response, and recovery that underpins all climate adaptation planning.                   |
| Forest Conservation Act                             | 1980                | Regulates diversion of forest land; critical for ecosystem-based adaptation; requires compensatory afforestation (CAMPAs) for any forest loss, directly relevant to the district's ecosystem resilience dimension.                           |
| Water (Prevention and Control of Pollution) Act     | 1974                | Establishes Central and State Pollution Control Boards; regulates water quality standards; relevant to the district's water security dimension and industrial effluent management.                                                           |
| Air (Prevention and Control of Pollution) Act       | 1981                | Regulates ambient air quality and emission standards; relevant to public health dimension, industrial emissions, and vehicular pollution management in the district.                                                                         |
| Biological Diversity Act                            | 2002                | Establishes Biodiversity Management Committees at local level; mandates biodiversity registers; directly relevant to ecosystem conservation and nature-based adaptation solutions.                                                           |
| National Action Plan on Climate Change (NAPCC)      | 2008                | Eight national missions covering solar energy, energy efficiency, water, Himalayan ecosystems, green India, sustainable agriculture, sustainable habitats, and strategic knowledge; provides the overarching policy framework for this DCAP. |
| State Action Plan on Climate Change (Uttar Pradesh) | Various             | State-specific climate adaptation and mitigation strategy for Uttar Pradesh; identifies state priorities, vulnerable districts, and sectoral action plans that should be integrated with this DCAP.                                          |
| Coastal Regulation Zone Notification                | 2019                | Not directly applicable to this inland district, but relevant to districts in the state with coastal exposure.                                                                                                                               |
| National Water Policy                               | 2012                | Prioritises water allocation (drinking > agriculture > industry); promotes integrated water resources management; provides policy guidance for the water security interventions in this DCAP.                                                |
| National Policy on Disaster Management              | 2009                | Provides the policy framework for shifting from relief-centric to preparedness-based approach; mandates mainstreaming DRR into development planning at all levels.                                                                           |
| Wetlands (Conservation and Management) Rules        | 2017                | Protects wetland ecosystems; establishes State Wetland Authorities; relevant to ecosystem restoration and nature-based flood management interventions.                                                                                       |
| Energy Conservation Act                             | 2001 (amended 2022) | Establishes BEE; mandates energy efficiency standards for buildings and appliances; carbon credit trading framework; relevant to urban resilience and mitigation co-benefits.                                                                |
| Mahatma Gandhi NREGA                                | 2005                | Guarantees 100 days rural employment; NRM component enables drought-proofing, water conservation, and afforestation works; critical implementation vehicle for several DCAP interventions.                                                   |

## Annexure E: SDG Alignment Matrix

Mapping of each sector in this DCAP to relevant Sustainable Development Goals (SDGs) and specific targets. This matrix demonstrates how climate adaptation investments in Kushinagar contribute to India's SDG commitments and the 2030 Agenda.

| DCAP SECTOR                 | SDG    | TARGETS                 | DESCRIPTION                                                                                                                         |
|-----------------------------|--------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Water Security              | SDG 6  | 6.1, 6.3, 6.4, 6.5, 6.6 | Clean water and sanitation; water use efficiency; integrated water resources management; wetland protection                         |
| Water Security              | SDG 13 | 13.1, 13.2, 13.3        | Climate resilience; climate change integration into planning; climate education                                                     |
| Agriculture & Food Security | SDG 2  | 2.1, 2.3, 2.4           | End hunger; agricultural productivity; sustainable food production systems                                                          |
| Agriculture & Food Security | SDG 15 | 15.3, 15.5              | Land degradation neutrality; biodiversity conservation                                                                              |
| Public Health               | SDG 3  | 3.3, 3.8, 3.9, 3.d      | End epidemics; universal health coverage; reduce pollution deaths; early warning for health risks                                   |
| Public Health               | SDG 11 | 11.5, 11.b              | Reduce disaster deaths and economic losses; integrated disaster risk reduction policies                                             |
| Infrastructure              | SDG 9  | 9.1, 9.4, 9.a           | Resilient infrastructure; sustainable and clean industrialisation; technology and financial support                                 |
| Infrastructure              | SDG 11 | 11.1, 11.5, 11.c        | Safe and affordable housing; reduce disaster impact; sustainable and resilient buildings                                            |
| Livelihoods & Skills        | SDG 1  | 1.1, 1.3, 1.5           | End extreme poverty; social protection systems; reduce exposure to climate shocks                                                   |
| Livelihoods & Skills        | SDG 8  | 8.3, 8.5, 8.6           | Productive employment; full employment; reduce youth NEET                                                                           |
| Ecosystem & Biodiversity    | SDG 15 | 15.1, 15.2, 15.3, 15.9  | Conservation of terrestrial ecosystems; sustainable forest management; land degradation neutrality; biodiversity values in planning |
| Ecosystem & Biodiversity    | SDG 14 | 14.2, 14.5              | Sustainable management of marine resources (indirect through upstream impacts)                                                      |
| Urban Resilience            | SDG 11 | 11.3, 11.5, 11.6, 11.7  | Inclusive urbanisation; reduce disaster impact; air quality; green public spaces                                                    |
| Urban Resilience            | SDG 7  | 7.1, 7.2, 7.3           | Access to modern energy; renewable energy share; energy efficiency                                                                  |
| Economic Resilience         | SDG 10 | 10.1, 10.2, 10.4        | Income growth of bottom 40%; social, economic and political inclusion; fiscal and social policies for equality                      |
| Economic Resilience         | SDG 17 | 17.1, 17.3, 17.17       | Domestic resource mobilisation; additional financial resources; public-private partnerships                                         |
| Governance & Institutions   | SDG 16 | 16.6, 16.7              | Effective, accountable and transparent institutions; responsive, inclusive and participatory decision-making                        |
| Governance & Institutions   | SDG 13 | 13.1, 13.2, 13.3        | Strengthen resilience and adaptive capacity; integrate climate measures into policies; climate education and awareness              |

This DCAP for Kushinagar directly contributes to 13 of the 17 SDGs, with primary alignment to SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities), SDG 6 (Clean Water and Sanitation), and SDG 15 (Life on Land). The convergence between climate adaptation and SDG achievement provides a strong case for integrated planning and funding at the district level.

## Annexure F: India's Climate Commitments & NDC Targets

India's nationally determined contributions (NDC) and long-term climate commitments provide the policy framework within which this DCAP operates. District-level climate action must align with and contribute to these national targets.

| COMMITMENT                              | TARGET                                                                                          | STATUS / TIMELINE                        | DCAP ALIGNMENT                                                     |
|-----------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------|
| <b>Net Zero Emissions</b>               | Net zero by 2070                                                                                | Announced COP26, Nov 2021                | Renewable energy, energy efficiency, ecosystem restoration actions |
| <b>Non-Fossil Energy Capacity</b>       | 500 GW by 2030                                                                                  | Updated NDC, Aug 2022                    | PM-KUSUM, PM Surya Ghar, JNNISM actions in this plan               |
| <b>Emissions Intensity Reduction</b>    | 45% reduction in GDP emissions intensity (vs 2005 baseline) by 2030                             | Updated NDC, Aug 2022                    | Energy efficiency, sustainable agriculture, transport actions      |
| <b>Carbon Sink</b>                      | Additional 2.5-3 billion tonnes CO2 equivalent through forest/tree cover by 2030                | Updated NDC, Aug 2022                    | Green India Mission, CAMPA, MISHTI, agroforestry actions           |
| <b>National Adaptation Plan</b>         | State Action Plans on Climate Change (SAPCC) in all states; district-level climate action plans | Ongoing — this DCAP contributes directly | All 9 sectors of this plan align with Uttar Pradesh's SAPCC        |
| <b>LiFE (Lifestyle for Environment)</b> | Mass movement for sustainable lifestyles: energy, water, waste behaviour change                 | Launched COP27, Nov 2022                 | Community engagement, awareness, behaviour change actions          |

This DCAP for Kushinagar is designed to contribute to India's NDC and Net Zero 2070 pathway at the district level. Every adaptation action recommended has co-benefits for mitigation through ecosystem restoration, renewable energy deployment, or emissions intensity reduction. The district's progress on this plan should be reported to the State Climate Cell for aggregation into India's national climate reporting under the Enhanced Transparency Framework of the Paris Agreement.

## Annexure G: Glossary of Technical Terms

Definitions of 44 technical terms, abbreviations, and acronyms used in this District Climate Action Plan. Terms are listed alphabetically.

| TERM / ABBREVIATION | DEFINITION                                                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CRI</b>          | Climate Resilience Index -- composite score (0-100) measuring district-level climate resilience across 7 dimensions                           |
| <b>CMIP6</b>        | Coupled Model Intercomparison Project Phase 6 -- the current generation of climate models used in IPCC AR6                                    |
| <b>SSP</b>          | Shared Socioeconomic Pathway -- scenarios combining emissions trajectories with socioeconomic assumptions                                     |
| <b>SSP1-2.6</b>     | Sustainability scenario: low emissions, rapid decarbonisation, reaching 2.6 W/m2 forcing by 2100                                              |
| <b>SSP2-4.5</b>     | Middle-of-the-road scenario: moderate emissions, reaching 4.5 W/m2 forcing by 2100                                                            |
| <b>SSP5-8.5</b>     | High-emissions scenario: fossil-fueled development, reaching 8.5 W/m2 forcing by 2100                                                         |
| <b>IPCC AR6</b>     | Sixth Assessment Report of the Intergovernmental Panel on Climate Change (2021-2022)                                                          |
| <b>NAPCC</b>        | National Action Plan on Climate Change -- India's 8-mission framework for climate action (2008)                                               |
| <b>SAPCC</b>        | State Action Plan on Climate Change -- state-level climate adaptation and mitigation strategy                                                 |
| <b>DDMA</b>         | District Disaster Management Authority -- statutory body under DM Act, 2005 chaired by District Collector                                     |
| <b>DDMP</b>         | District Disaster Management Plan -- comprehensive disaster preparedness plan updated annually                                                |
| <b>CBDRT</b>        | Community-Based Disaster Response Team -- trained village-level first responders (10-30 members per village)                                  |
| <b>EWS</b>          | Early Warning System -- technology and process for timely hazard warnings via SMS, siren, radio                                               |
| <b>NDVI</b>         | Normalised Difference Vegetation Index -- satellite-derived measure of vegetation health (-1 to +1)                                           |
| <b>SPI</b>          | Standardised Precipitation Index -- measure of drought severity (negative = drought, positive = wet)                                          |
| <b>LPA</b>          | Long Period Average -- climatological normal rainfall (typically 1951-2000 average)                                                           |
| <b>CSA</b>          | Climate-Smart Agriculture -- farming practices that increase productivity, resilience, and reduce emissions                                   |
| <b>MGNREGA -NRM</b> | MGNREGA Natural Resource Management -- drought-proofing assets created under the employment guarantee act                                     |
| <b>PMKSY</b>        | Pradhan Mantri Krishi Sinchai Yojana -- national micro-irrigation programme (per drop more crop)                                              |
| <b>JJM</b>          | Jal Jeevan Mission -- national programme for functional household tap water connections (Har Ghar Jal)                                        |
| <b>PMAY-G</b>       | Pradhan Mantri Awas Yojana - Gramin -- rural housing programme providing Rs 1.2-1.3 Lakh per unit                                             |
| <b>NHM</b>          | National Health Mission -- umbrella programme for healthcare system strengthening (NRHM + NUHM)                                               |
| <b>PMFBY</b>        | Pradhan Mantri Fasal Bima Yojana -- national crop insurance programme with subsidy on premiums                                                |
| <b>CAMPA</b>        | Compensatory Afforestation Fund Management and Planning Authority -- funds afforestation from forest diversions                               |
| <b>SDRF</b>         | State Disaster Response Fund -- state-level fund for immediate disaster response (75:25 Centre:State)                                         |
| <b>NDRF</b>         | National Disaster Response Fund -- central fund for severe disasters declared by the central government                                       |
| <b>GCF</b>          | Green Climate Fund -- multilateral climate finance mechanism under UNFCCC (\$100B/year target)                                                |
| <b>GLOF</b>         | Glacial Lake Outburst Flood -- sudden release of water from a moraine-dammed glacial lake                                                     |
| <b>UHI</b>          | Urban Heat Island Effect -- temperature elevation in urban areas relative to surrounding rural areas                                          |
| <b>NBS</b>          | Nature-Based Solutions -- actions to protect, manage, and restore ecosystems for climate adaptation                                           |
| <b>EbA</b>          | Ecosystem-based Adaptation -- using biodiversity and ecosystem services for climate adaptation                                                |
| <b>DRR</b>          | Disaster Risk Reduction -- systematic efforts to analyse and reduce causal factors of disaster risk                                           |
| <b>GHG</b>          | Greenhouse Gas -- gases that trap heat in the atmosphere (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, SF <sub>6</sub> ) |
| <b>NDC</b>          | Nationally Determined Contribution -- India's climate targets under the Paris Agreement                                                       |
| <b>RCP</b>          | Representative Concentration Pathway -- predecessor emission scenario framework to SSPs                                                       |
| <b>ENSO</b>         | El Nino-Southern Oscillation -- Pacific Ocean climate pattern affecting Indian monsoon variability                                            |
| <b>IOD</b>          | Indian Ocean Dipole -- Indian Ocean temperature anomaly pattern affecting regional weather                                                    |
| <b>MJO</b>          | Madden-Julian Oscillation -- intraseasonal tropical atmospheric circulation pattern affecting monsoon active/break cycles                     |
| <b>PHC</b>          | Primary Health Centre -- first-tier rural healthcare facility serving ~30,000 population                                                      |
| <b>CHC</b>          | Community Health Centre -- secondary-tier healthcare facility with 30 beds serving ~120,000 population                                        |
| <b>SHG</b>          | Self-Help Group -- women's savings and credit group (10-20 members) for livelihood and social empowerment                                     |

| TERM / ABBREVIATION | DEFINITION                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------------|
| <b>NRLM</b>         | National Rural Livelihoods Mission (DAY-NRLM) -- national programme for SHG-based livelihood promotion |
| <b>BDO</b>          | Block Development Officer -- key administrative official at sub-district (block) level                 |
| <b>SDM</b>          | Sub-Divisional Magistrate -- administrative head of a sub-division within a district                   |

## Annexure H: References & Bibliography

Complete bibliography of 24 sources cited in this District Climate Action Plan for Kushinagar. References include peer-reviewed literature, government reports, international assessments, and data portals.

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All data sources were accessed between January 2025 and July 2026. Climate projections are based on CMIP6 multi-model ensemble outputs downloaded from the Earth System Grid Federation (ESGF) data portal. Socioeconomic data are drawn from Census of India 2011, supplemented by the NITI Aayog SDG India Index 2023-24 where available. Government scheme information is based on official ministry portal data as of December 2024.

## Annexure I: Contact & Support

For institutional advisory, implementation support, customised analysis, or data queries related to this District Climate Action Plan, please contact:

### Resilient Sustainance Private Limited

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**Email:** [info@rsustain.com](mailto:info@rsustain.com)

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**CIN:** U74999PN2019PTC187951

#### Services Available:

- Customised District Climate Action Plans
- Climate vulnerability assessment and mapping
- Implementation support and capacity building
- Climate finance advisory and proposal development
- Monitoring, evaluation, and reporting frameworks
- Training for district and state officials
- Integration with SAPCC and DDMP processes



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## ResilientPulse

District-Level Climate Resilience Intelligence for India



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