
# Children and Loss & Damage, Udaipur

October 2024

Study commissioned by:

**UNEP - Copenhagen Climate Centre (CCC)**

Report produced by:

**ICLEI South Asia in partnership with Transitions Research**

## Acknowledgements

ICLEI South Asia would like to express its sincere gratitude to the government officials that have been consulted and the private stakeholders from Udaipur whose work has been referenced.

## Disclaimer

This document includes findings from the review of policies and plans at the National, State, and City level, largely based on the secondary background research conducted to arrive at the policy landscape that governs the loss and damage assessment in Udaipur city, Rajasthan, India and may require detailing as per the dedicated studies in the subsequent phases of the project.

## Authors

Emani Kumar, Divyaprakash Vyas, Prerna Singh, Bedoshruti Sadhukhan, Avantika Arjuna, Yougal Tak, Om Prakash, Manasa Garikaparthi



## Contact

**ICLEI - Local Governments for Sustainability, South Asia**
C-3 Lower Ground Floor, Green Park Extension,
New Delhi - 110016, India
Tel: +91–11–4974 7200;
Email: iclei-southasia@iclei.org

# Contents


**1. Introduction** **5**
**2. Scope of work for Work Package (WP)** **6**
To be updated 6
**3. Ex-post system characteristics** **7**
3.1 Current Status of Loss and Damage Assessment 7
3.1.1 Overview of Loss and Damage Assessment Methodologies - Global & National 7
3.1.2 Overview of National Disaster Management Act, 2005 10
3.1.3 Overview of the National Policy on Disaster Management (NPDM), 2009 12
3.1.4 Overview of Rajasthan State Disaster Management Act 2005 13
3.1.5 Overview of Rajasthan State Disaster Management Plan (SDMP) 2014 14
3.1.6 Overview of Udaipur District Disaster Management Plan (DDMP) 2024-25 16
3.1.7 Existing official process for estimating Loss and Damage 17
3.2 Loss and Damage Assessment: Udaipur City 18
3.2.1 Economic Impacts 19
3.2.2 Non-Economic Impacts 19
3.3 Loss and Damage Assessment for Young Children and Pregnant Women in Udaipur 21
3.3.1 Health Impacts 21
3.3.2 Nutritional Impacts 22
3.3.3 Delay in Referral Services 22
3.3.4 Education Loss 23
3.3.5 Safety and Protection issues 23
3.3.6 WASH related issues 24
3.3.7 Loss of Cultural Identity Due to In-Migration 24
3.3.8 Impact on Family Livelihoods and Economic Loss 24
3.3.9 Children at Construction sites 25
**4 Stakeholder engagement and thematic analysis** **25**
4.1 Focus Group Discussions (FGDs) 25
4.2 Stakeholder Interviews 26
4.2.1 Stakeholder Identification and Recruitment: 26
4.2.2 Engagement Approach: 26
4.2.3 Data Collection and Analysis: 27
**5 City Profile** **27**
5.1 Demography 28
5.2 Road Network 32
5.3 Vehicular Growth 33
5.4 Air Quality 33
5.5 Economic Activities 34
5.5.1 In-migration 35
5.6 Main Urban Services in Udaipur & Responsibility Matrix 35
**6 Udaipur's Climate Journey** **35**
6.1 Climate Risk and Vulnerability Assessment 36
6.1.1 Vulnerability to Urban Heat 38
6.1.2 Vulnerability to Urban Flooding 38
6.2 Future Climate Projections 42
6.2.1 Rainfall Projections 42
6.2.2 Temperature Projections: 42
6.2.3 City level Plan and Policies related to Environment and Climate Change 43
**7 Loss and Damage Metrics and rationale for Inclusion** **43**
**8 Climate Vulnerability Assessment** **45**
**9 Conclusion** **49**
**10. Annexures** **50**

# 1. Introduction

*[To be UPDATED once all sections are complete]*

This assessment presents a review of loss and damage aspects specific to Udaipur, drawing from policy plans, reports, and published literature, with a focus on the impacts of extreme weather events such as floods and extreme heat on children. Udaipur's vulnerability to extreme weather events such as floods and heatwaves has significant economic and non-economic impacts. Children and vulnerable communities are disproportionately affected, with severe consequences for their health, safety, and well-being.

The database encompasses six critical areas essential to their well-being: health, education, WASH (Water, Sanitation, and Hygiene), nutrition, protection, and cultural identity.

The selection of these indicators was informed by studies conducted globally, across India, and specifically in Udaipur. This approach ensures a comprehensive and grounded understanding of how climate change affects children. The organisation of the categories was adapted from a study by the Gorakhpur Environmental Action Group (2017), with additional areas tailored specifically for Udaipur.

# 2. Scope of Work Package

*[To be UPDATED]*

# 3. Ex-post system characteristics

## 3.1 Current Status of Loss and Damage Assessment

### 3.1.1 Overview of Loss and Damage Assessment Methodologies - Global & National

Globally, five methodologies are widely used for the assessment of damages, losses, and recovery needs caused by disaster (DLRND), namely-

1) Damage and Loss Assessment (DaLA),
2) Post Disaster Need Assessment (PDNA),
3) Recovery Need Assessment (RNA),
4) Global Rapid Post-Disaster Damage Estimation (GRADE), and
5) Rapid Impact & Needs Assessment (RINA).

In India, two methodologies are used to assess the damages and losses of natural disasters:

1) Damage and Loss Assessment (DaLA) and
2) Post Disaster Need Assessment (PDNA).

The National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Government of India has also developed the Post Disaster Needs Assessment (PDNA) Tools for India under the National Cyclone Risk Mitigation Project assisted by the World Bank. The objective of these tools is to establish a standardized mechanism based on scientific approach for conducting post disaster needs assessment for long term recovery and reconstruction. The newly developed tools are based on the existing damage assessment system in India and an internationally-accepted methodology which has been used worldwide and adopted by the United Nations Development Group (UNDG), the European Union (EU) and the World Bank (WB) which signed a joint declaration in 2008 on Post-Crisis Assessments and Recovery Planning.

NIDM has completed the tools for calculating indirect loss, opportunity cost loss and its impact on the macro economy of the affected state. The current tool is an improvisation on the international tool initially developed by UNECLAC (United Nation Economic Commission of Latin American Countries). It has been customized to the Indian context and procedures and has been made easy to use by the officials at the local levels.

The PDNA is the most updated methodology that includes DaLA and RNA (World Bank 2013). This (PDNA) methodology has been used only twice in India:

1) the Kerala flood and
2) the FANI cyclone in Odisha,

During the Kerala flood, with the help of the government of Kerala, the United Nations, the World Bank, and the Asian Development Bank, a PDNA was conducted to assess the damages, losses, and need for reconstruction. The PDNA estimated the total damages to be around INR 10,557 crore and total losses to be around INR 16,163 crore (Govt. of Kerala 2018).

With the joint effort of the Department of Economic Affairs, Ministry of Finance, Government of India; the United Nations, the World Bank, and Asian Development Bank, detailed damage, loss, and needs assessment (DLNA) was conducted in Odisha to support the recovery process after the FANI cyclone. The assessment report estimated the total damages to be worth INR 16,465 crore (USD 2,352 million) and total losses to be worth INR 7,712 crore (USD 1,102 million). The recovery needs were estimated at INR 29,315 crore (USD 4,188 million) (Govt. of Odisha 2019).

For incurring expenditure from the Calamity Relief Fund (CRF) and the National Calamity Contingency Fund (NCCF), the Govt. of India, Ministry of Home Affairs, New Delhi, Existing approach which States use for the development of the Relief Memorandum – eg. kerala to avail through SDRF and NDRF.

**Brief comparison of DaLa and PDNA methodology –**

| Methodology | Year of Launch | Developed by | Strength | Weaknesses | Used by (States/ Countries) |
|---|---|---|---|---|---|
| DaLA (Damage and Loss Assessment) | 1972 | UN-ECLAC (United Nations-Economic Commission for Latin America & Caribbean). | a. Includes direct and indirect losses. b. Assess disaster effects across most of the sectors of society & economy. c. Give inputs for economic recovery and reconstruction. | a. Assess only the value of destroyed assets & change in production flows of goods and services but not overall macro-economic impact. b. No assessment of impacts at personal or household levels on income & costs of living. c. Does not include all the sectors of the economy. | Managua (Earthquake), Gujarat (Earthquake), Indonesia, Thailand, India, Sri Lanka, Maldives (Indian Ocean Tsunami) |

| Methodology | Year of Launch | Developed by | Strength | Weaknesses | Used by (States/ Countries) |
|---|---|---|---|---|---|
| PDNA (Post Disaster Need Assessment) | 2008 | UNDP, EU, World Bank | a. Detailed and globally accepted methodology.<br>b. Covers every sector of the economy. Comprehensive & systematic methodology.<br>c. In-depth analysis of Damages, Losses, and needs of the country. | a. Limited evidence of inclusion of the Private sector.<br>b. Exclusion of marginalised & vulnerable people.<br>c. Accountability issue.<br>d. There is no specific assessment procedure to cater to the needs of smaller countries. | More than 60 countries have used it. |
| PDNA (Post Disaster Need Assessment) | 2019 | National Institute of Disaster Management, under the Ministry of Home Affairs, Govt. Of India | a. A systematic and comprehensive version of PDNA methodology.<br>b. Include the needs of India specifically.<br>c. Provide a long- term recovery & reconstruction plan.<br>d. Indirect losses, opportunity costs, and macroeconomic impacts are included. | a. Some sectors are yet to be included.<br>b. Unavailability of data for each sector.<br>c. Private losses are not accounted for.<br>d.Underestimation of building back better cost.<br>e. Local government, villagers, and communities are not given much importance in the study. | India (Kerala Flood and Odisha FANI Cyclone) |

### 3.1.2 Overview of National Disaster Management Act, 2005

Under the act, the following institutions, committees, plans and policies have been set-up at national, state and district level–

- Disaster Management Authority with clearly defined powers and functions
- Advisory committee for overall coordination, hand-holding and technical assistance
- Executive committee and sub-committee
- Formulation of disaster management plans
- Guidelines for minimum standards of relief
- National Institute of Disaster Management – responsible for planning and promoting training and research in the area of disaster management, documentation and development of information base relating to disaster management policies, prevention mechanisms and mitigation measures.
- National Disaster Response Force
- Disaster Response Fund and Disaster Mitigation Fund

**Core focus of National Disaster Management Plan –**

- Measures to be taken for the prevention of disasters, or the mitigation of their effects;
- Measures to be taken for the integration of mitigation measures in the development plans;
- Measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster;
- Roles and responsibilities of different Ministries or Departments of the Government of India in respect of measures specified in clauses (a), (b) and (c).

Guidelines for minimum standards of relief at national level—

- The minimum requirements to be provided in the relief camps in relation to shelter, food, drinking water, medical cover and sanitation;
- The special provisions to be made for widows and orphans;
- Ex-gratia assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood;
- Such other relief as may be necessary.

**Core focus of State Disaster Management Plan –**

- The vulnerability of different parts of the State to different forms of disasters;
- The measures to be adopted for prevention and mitigation of disasters;
- The manner in which the mitigation measures shall be integrated with the development plans and projects;
- The capacity-building and preparedness measures to be taken;
- The roles and responsibilities of each Department of the Government of the State in relation to the measures specified in clauses (b), (c) and (d) above;
- The roles and responsibilities of different Departments of the Government of the State in responding to any threatening disaster situation or disaster.

Guidelines for minimum standard of relief by State Authority—

The State Authority shall lay down detailed guidelines for providing standards of relief to persons affected by disaster in the State, provided that such standards shall in no case be less than the minimum standards in the guidelines laid down by the National Authority in this regard.

**Core focus of District Disaster Management Plan** –

- The areas in the district vulnerable to different forms of disasters;
- The measures to be taken, for prevention and mitigation of disaster, by the Departments of the Government at the district level and local authorities in the district;
- The capacity-building and preparedness measures required to be taken by the Departments of the Government at the district level and the local authorities in the district to respond to any threatening disaster situation or disaster;
- The response plans and procedures, in the event of a disaster.

Responsibilities of National, State level Ministries or Departments—

- Take measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the Authority;
- Integrate into its development plans and projects, the measures for prevention or mitigation of disasters in accordance with the guidelines laid down by the Authority;
- Respond effectively and promptly to any threatening disaster situation or disaster in accordance with the guidelines of the Authority or the directions of the Executive Committee in this behalf;
- Review the enactments administered by it, its policies, rules and regulations, with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness;
- Allocate funds for measures for prevention of disaster, mitigation, capacity-building and preparedness;
- Provide assistance to the National Authority and State Governments for—
    - drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management;
    - carrying out rescue and relief operations in the affected area;
    - assessing the damage from any disaster;
    - carrying out rehabilitation and reconstruction;
- Make available its resources to the National Executive Committee or a State Executive Committee for the purposes of responding promptly and effectively to any threatening disaster situation or disaster

Responsibilities ofLocal authorities –

Subject to the directions of the District Authority, a local authority shall—

- Ensure that its officers and employees are trained for disaster management;
- Ensure that resources relating to disaster management are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster;

- Ensure all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National Authority, State Authority and the District Authority;
- Carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the State Plan and the District Plan.

### 3.1.3 Overview of the National Policy on Disaster Management (NPDM), 2009

The objectives of the National Policy on Disaster Management are:

- Promoting a culture of prevention, preparedness and resilience at all levels through knowledge, innovation and education.
- Encouraging mitigation measures based on technology, traditional wisdom and environmental sustainability.
- Mainstreaming disaster management into the developmental planning process.
- Establishing institutional and techno-legal frameworks to create an enabling regulatory environment and a compliance regime.
- Ensuring efficient mechanism for identification, assessment and monitoring of disaster risks.
- Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communication with information technology support.
- Ensuring efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society.
- Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat for ensuring safer living.
- Promoting a productive and proactive partnership with the media for disaster management.

Financial Arrangements–

- Information on the National and state disaster response and mitigation funds.
- Considering that the assistance provided by the Government for rescue, relief, rehabilitation and reconstruction needs cannot compensate for massive losses on account of disasters, new financial tools such as catastrophe risk financing, risk insurance, catastrophe bonds, micro-finance and insurance etc., will be promoted with innovative fiscal incentives to cover such losses of individuals, communities and the corporate sector.

Reconstruction and Recovery Approach –

- The approach to the reconstruction process has to be comprehensive so as to convert adversity into opportunity.
- Incorporating disaster resilient features to ‘build back better’ will be the guiding principle.
- This phase requires the most patient and painstaking effort by all concerned.
- The appropriate choice of technology and project impact assessment needs to be carried out to establish that the projects contemplated do not create any side effects on the physical, socio-cultural or economic environment of the communities in the affected areas or in their neighbourhood.

Linking Recovery with Safe Development –

- Emphasis will be laid on plugging the gaps in the social and economic infrastructure and infirmities in the backward and forward linkages.
- Efforts will be made to support and enhance the viability of livelihood systems, education, health care facilities, care of the elderly, women and children, etc.
- Other aspects warranting attention will be roads, housing, drinking water sources, provision for sanitary facilities, availability of credit, supply of agricultural inputs, upgradation of technologies in the on-farm and off-farm activities, storage, processing, marketing, etc.

Livelihood restoration –

- State governments will have to lay emphasis on the restoration of permanent livelihood of those affected by disasters and special attention to the needs of women-headed households, artisans, farmers and people belonging to marginalised and vulnerable sections.

### 3.1.4 Overview of Rajasthan State Disaster Management Act 2005

The Rajasthan State Disaster Management Act, 2005 provides the legislative framework for managing disasters in Rajasthan. It lays out guidelines for disaster prevention, preparedness, mitigation, response, and recovery. The Act's provisions aim to create a structured approach to deal with both natural and man-made disasters and ensure the safety and resilience of the state's population. This legislative framework ensures a coordinated approach to disaster management across Rajasthan, enhancing the state's preparedness and response capabilities while fostering community participation in building disaster resilience. Below are the key provisions of the Act.

**Formation of Disaster Management Authorities**

The Rajasthan State Disaster Management Authority (RSDMA) was established to oversee the coordination of disaster management activities in the state. Additional key organizations include the district-level District Disaster Management Authorities (DDMAs), headed by the District Collector, along with local authorities, municipal bodies, and other relevant agencies.

**Function of State Government**

The state government's role is to develop policies, guidelines, and disaster management plans. This includes overseeing preparedness, mitigation, and recovery efforts across departments. Functions include collecting and maintaining data on hazards, developing disaster management plans, conducting awareness programs, and ensuring that resources are in place for disaster response. The State Executive Committee (SEC) assists the RSDMA in policy formulation and implementation.

**Roles of Local Authorities and Community Organizations**

- Local authorities, in consultation with state agencies, are responsible for drafting and implementing disaster management plans for their jurisdictions.
- The Act emphasizes community involvement in disaster preparedness, capacity building, and relief operations. Non-governmental organizations (NGOs), community groups, and the private sector are also encouraged to participate in disaster response activities.

**Response and Relief**

The Relief Commissioner and District Collectors are empowered to organize and coordinate emergency relief efforts during a disaster. These efforts may involve managing evacuations, providing medical aid,

setting up temporary shelters, and securing affected areas. Essential services and infrastructure restoration, such as transportation and communication, are prioritized during relief operations.

### Areas at Risk of Disaster

The Act allows for the declaration of certain regions as disaster-prone areas, enabling targeted interventions like risk assessments, early warning systems, and infrastructure improvements in those zones.

### Violations and Related Penalties

The Act provides for penalties for obstructing disaster management operations, spreading false information about disasters, or making fraudulent claims for relief and assistance.

### Accounts, Audit, and Finance

The Rajasthan Disaster Management Fund is created under the Act to finance disaster-related activities. This includes relief operations, preparedness measures, and recovery projects. ○ Provisions for the proper use, auditing, and budgeting of funds are included, ensuring transparency and accountability in disaster management finance.

## 3.1.5 Overview of Rajasthan State Disaster Management Plan (SDMP) 2014

The Rajasthan State Disaster Management Plan (SDMP) 2014 aligns with the National Disaster Management Act, 2005 and serves as a comprehensive framework for disaster preparedness, response, recovery, and risk reduction in the state. The Rajasthan SDMP 2014 provides a robust framework for managing disasters with a focus on building resilience, enhancing preparedness, and improving risk governance. The plan integrates disaster risk reduction with development policies, emphasizing both immediate response and long-term recovery. Below is an overview of the plan's key features:

### Vulnerability Snapshot

The SDMP highlights vulnerable populations in the state, disaggregated by various social factors such as Below Poverty Line (BPL) population, Persons with Disabilities (PwDs), the elderly and children (Census 2011), and registered pregnancies (NFHS 2019). It further analyzes the structural vulnerabilities related to housing, infrastructure, and services in high-risk areas, alongside economic and environmental vulnerabilities identified through the 2011 census.

### Key Hazards

The plan identifies nine major hazards in Rajasthan: earthquakes, floods, droughts, extreme heat, epidemics, chemical disasters, and industrial accidents. The framework takes a proactive approach toward risk reduction by focusing on hazard-specific preparedness and mitigation measures.

### Thematic Areas of Focus

The SDMP integrates key themes from the Sendai Framework for Disaster Risk Reduction and focuses on the following six thematic areas for disaster risk management:

1. **Understanding Risk**: Improving risk assessment and hazard mapping.

2. **Inter-Agency Coordination**: Ensuring coordination between government agencies, local authorities, and community organizations.
3. **Investing in DRR – Structural Measures**: Strengthening physical infrastructure like dams, buildings, and flood controls.
4. **Investing in DRR – Non-Structural Measures**: Emphasizing policies, awareness, and capacity building.
5. **Capacity Building**: Training government officials and local communities in disaster management.
6. **Climate Change Risk Management**: Integrating climate change adaptation strategies into disaster management plans.

### Preparedness and Awareness

The plan emphasizes public awareness campaigns, regular mock drills, and community-level preparedness. Special focus is placed on technological solutions like early warning systems and disaster mapping. Training programs for government personnel, NGOs, and community volunteers are outlined to ensure prompt and coordinated responses during disasters.

### Disaster Response and Relief

The SDMP outlines detailed procedures for disaster response, including search and rescue operations, health services, and the provision of temporary shelters. Relief efforts include the immediate restoration of essential services, distribution of emergency kits, and financial aid to affected populations. The "Build Back Better" principle is central to post-disaster recovery efforts, aiming to rebuild with resilience and sustainability.

### Community and Stakeholder Involvement

The plan encourages active participation from local communities, NGOs, and businesses. Gender sensitivity and inclusion of vulnerable groups such as women, children, and PwDs are emphasized. The role of local disaster management committees in risk assessment, preparedness, and relief efforts is highlighted.

### Loss and Damage Assessment

The SDMP provides a framework for assessing the social, economic, and environmental impacts of disasters, focusing on both immediate losses (lives, livelihoods, infrastructure) and long-term damage (environmental degradation, social dislocation). It recommends conducting a Post-Disaster Needs Assessment (PDNA) to guide recovery efforts, starting with immediate damage assessments for urgent response, followed by detailed evaluations to address long-term impacts on housing, agriculture, and infrastructure. The plan emphasizes rebuilding with the "Build Back Better" approach to enhance future disaster resilience.

### Relief and Compensation

The plan outlines relief mechanisms, including compensation for affected populations, and prioritizes vulnerable groups for the disbursement of relief funds. Relief measures such as financial assistance, the provision of relief kits, and the reconstruction of infrastructure are initiated based on the damage assessment.

### Governance and Coordination

The Rajasthan State Disaster Management Authority (RSDMA) is the lead agency responsible for overseeing disaster management efforts in the state, in collaboration with district-level authorities and local governance bodies. Disaster Management Funds are earmarked to ensure a steady flow of financial resources for disaster preparedness, response, and recovery.

### 3.1.6 Overview of Udaipur District Disaster Management Plan (DDMP) 2024-25

The Udaipur District Disaster Management Plan (DDMP) 2024-25 outlines a comprehensive approach to disaster preparedness, mitigation, response, and recovery. The plan focuses on reducing the loss of life and property due to disasters in the district, which is prone to hazards such as floods, droughts, earthquakes, landslides, and extreme heat. The Udaipur DDMP focuses on strengthening local capacity, improving disaster risk governance, and building resilience in the district through proactive disaster risk reduction measures. The plan aims to minimize the impacts of disasters and ensure a coordinated and efficient response to protect lives and livelihoods.

**Institutional Arrangements**

The Udaipur District Disaster Management Committee (DDMC), chaired by the District Collector, is responsible for overseeing all disaster management efforts. The DDMC coordinates between various government departments, NGOs, local authorities, and community organizations to ensure an integrated disaster response. Specific tasks, such as search and rescue operations, shelter management, health services, and sanitation, are delegated to designated task forces.

**Hazard Vulnerability and Risk Assessment**

Udaipur is vulnerable to multiple hazards, with particular susceptibility to floods due to its proximity to lakes and rivers, earthquakes (located in Seismic Zone II), and drought due to recurring water scarcity.

A detailed risk assessment is conducted for key areas in the district, including Girwa, Bargaon, Gogunda, and Kherwara blocks, which have been identified as high-risk zones for natural disasters. The plan incorporates a multi-hazard risk assessment to understand the district's vulnerabilities better.

**Preparedness and Mitigation**

The DDMP emphasizes preparedness through regular mock drills, public awareness programs, and capacity-building exercises for government officials, community leaders, and local volunteers. Mitigation measures focus on retrofitting vulnerable buildings, enforcing disaster-resilient building codes, and improving early warning systems for floods and other hazards. The engagement of local communities in disaster preparedness activities, such as village-level disaster management plans and training programs, is a key focus of the plan.

**Response Mechanism**

During disasters, the District Emergency Operation Centre (DEOC) is activated to coordinate the response across various agencies. Task forces led by different government departments ensure timely rescue, relief, and rehabilitation. The plan details standard operating procedures for evacuation, search and rescue operations, and the provision of essential services like food, water, medical aid, and shelter during emergencies. The Incident Response System (IRS) is used to streamline roles and responsibilities, ensuring quick decision-making and resource mobilization.

### Recovery and Rehabilitation

Post-disaster recovery efforts focus on restoring essential infrastructure, including roads, water supply, and healthcare facilities. The plan emphasizes long-term recovery through the "Build Back Better" strategy, ensuring reconstruction efforts result in more resilient infrastructure and communities. Rehabilitation of affected populations, including livelihood support and the restoration of community infrastructure, is a key priority.

### Public Awareness and Capacity Building

A strong focus is placed on raising public awareness about disaster risks through educational campaigns, school programs, and community training sessions. The DDMP promotes capacity building for local disaster response teams, and encourages the involvement of local governance institutions like Panchayati Raj Institutions (PRIs) in planning and preparedness activities. Regular training programs for government staff and community leaders ensure a state of readiness to handle disasters effectively.

### Focus on Climate-Related Hazards

The Udaipur DDMP highlights the district's vulnerability to climate-induced hazards like drought and extreme heat, which have worsened due to climate change. The plan emphasizes preparedness through targeted action plans, including public health advisories, community shelters, and water conservation measures to protect at-risk populations. Special focus is given to vulnerable groups such as children, pregnant women, the elderly, and the economically disadvantaged, ensuring they are equipped to handle these hazards. By integrating mitigation and adaptation strategies, the DDMP aims to build climate resilience and safeguard lives and livelihoods in Udaipur.

## 3.1.7 Existing official process for estimating Loss and Damage

### Assessment of losses and damages

- Once a disaster is announced, the first step is to coordinate rescue and relief operations.
- At the same time, the team on the ground, whose size and composition are determined by the magnitude of the disaster, collects damage-related data.
- Once the disaster ends, the revenue department and disaster management officials at the district level verify the information and upload it to the centralised National Disaster Information Management System.
- The state disaster management authority reverifies the information and calculates the economic value based on the **Norms of Assistance, a Central document** which assigns values to different losses, to avail funding from the state disaster relief fund and the state government's budget.
- If there is a gap in funding, they prepare a memorandum to close the gap with funding from the National Disaster Relief Fund. It is subject to approval by a central team that revisits the data.
- In the case of slow-onset extreme events like drought, agencies monitor its onset by looking at precipitation and soil moisture levels. After the onset, district and panchayat level teams create seed, fodder banks and create jobs under Mahatma Gandhi National Rural Employment Guarantee Act 2005.
- When state decides that the existing mechanism is unable to handle disaster management operations, international agencies like World Bank are roped in to carry out Joint Rapid Damage

and Needs Assessment. It was used during the Uttarakhand floods of 2013 and the Kerala floods of 2018 and 2021.

**Use robust tools**

- In 2018, India for the first time, used the **post-disaster needs assessment** tool for the Kerala floods, which had already been used across the world since 2008. In 2019, cyclone Fani in Odisha was the second disaster that used this tool. A post-disaster needs assessment has been undertaken for the Assam floods of 2022 as well.
- It replaces an internationally accepted tool called damage, loss and needs assessment, which focuses on physical infrastructure and not on social sectors. In India, the Bhuj Earthquake of 2001 and tsunami of 2004, used damage, loss and needs assessment for funding from the World Bank.
- Besides analysing immediate damage, a post-disaster needs assessment, carried out along with international agencies such as World Bank, looks at macro-economic costs such as the impact of the disaster on the local economy**.** It has a third component that looks at improving the resilience of the region.
- In 2019, India released a manual for this assessment, and this year at least eight states are using it for floods. The country plans to migrate to this tool for all kinds of disasters over the next three years.

**Fund compensation**

- While the disaster is underway, only relief is provided. All compensation occurs post-disaster.
- Each state has a disaster relief fund, which is financed by the Union Ministry of Home Affairs, and the respective state/UT budget. The amount and the Centre-state share is decided by the Finance Commission.
- State relief funds are allocated money based on a combination of capacity (as reflected through expenditure), risk exposure (area and population) and hazard and vulnerability (risk index).
- In the 15th Finance Commission (2021-26) (https://shorturl.at/0A2fb), the corpus for the entire period is `160,153 crore. The Centre's share is Rs 1,22,601 crore. The amount is broken down into six instalments and released annually to state funds.
- Finance Commission allocates additional funds for urban floods, landslide-prone states and others.
- State governments, at times, announce additional compensation to either augment the existing amount or cover a bigger population. Maharashtra, in the past, has announced compensation for farmer suicides.

  (Source: https://www.downtoearth.org.in/climate-change/run-up-to-cop27-here-is-how-india-counts-loss-and-damage-due-to-extreme-weather-85659).

## 3.2 Loss and Damage Assessment: Udaipur City

This assessment presents a review of loss and damage aspects specific to Udaipur, drawing from policy plans, reports, and published literature, with a focus on the impacts of extreme weather events such as floods and extreme heat.

Udaipur's vulnerability to extreme weather events such as floods and heatwaves has significant economic and non-economic impacts. Children and vulnerable communities are disproportionately affected, with severe consequences for their health, safety, and well-being.


हिंदी समाचार / न्यूज / राजस्थान / उदयपुर में बरस रही आग! सूने पड़े पर्यटन स्थल, 7 साल बाद इतनी तेज गर्मी, पारा पहुंचा 45 डिग्री

उदयपुर में बरस रही आग! सूने पड़े पर्यटन स्थल, 7 साल बाद इतनी तेज गर्मी, पारा पहुंचा 45 डिग्री

LOCAL 18

टूर गाइड ओम सिंह राठौड़ ने बताया कि इस बार गर्मी का मौसम होने की वजह से उदयपुर शहर का तापमान भी काफी ज्यादा बड़ा हुआ है इसी वजह से उदयपुर शहर में पर्यटकों का आना बहुत कम हो गया है. उम्मीद लगाई जा रही है कि जुलाई मध्य के बाद उदयपुर शहर एक बार फिर से पर्यटकों से गुलजार होगा.

• NEWS18 RAJASTHAN
• LAST UPDATED : MAY 28, 2024, 11:16 IST

Join our Channel

REPORTED BY : Nisha Rathore
EDITED BY : Mohd Majid

## 3.2.1Economic Impacts

### Trade and Livelihoods

**Impact on Trade and Supply Chains**: Udaipur's local markets, particularly small vendors and traders, are highly vulnerable to extreme weather events. During heavy rains and flooding, vendors selling perishable goods face the risk of spoilage, leading to increased debt. The supply chain for goods is also disrupted, reducing availability and raising costs.

**Loss of Infrastructure**: Udaipur has experienced substantial infrastructure damage due to flooding. Reports indicate that major trade centers, roads, and market areas have been affected, with severe waterlogging disrupting transportation networks and access to markets. Flooding in 2022 led to an estimated loss of INR 500 crore in trade and infrastructure.

**Loss of Property**: Flooding in areas near the Ayad River has caused significant property damage in low-lying settlements. Informal settlements in particular lack adequate infrastructure to withstand such events, leading to higher losses in assets. An estimated 400 houses were severely damaged during recent flooding events, with numerous vehicles submerged in waterlogged areas.

### Livelihoods

**Loss of Livelihoods**: Extreme rainfall and subsequent flooding have resulted in loss of working days, particularly for those living in informal settlements. In these areas, workers face severe difficulties in reaching their places of employment due to waterlogged roads and damaged infrastructure. The informal workforce, including daily-wage laborers and street vendors, is disproportionately affected.

**Heat-related Livelihood Losses**: Extreme heat events are increasingly affecting productivity, especially for outdoor workers. With rising temperatures, vendors, laborers, and small traders face health risks, which in turn reduces their working hours and income. Extended periods of heatwaves have intensified economic vulnerabilities for these populations.

## 3.2.2 Non-Economic Impacts

### Loss of Life

**Heat-Related Mortality**: Udaipur has seen a steady rise in heat-related mortality. During the 2023 heatwave, the city recorded over 15 heat-related fatalities, primarily among vulnerable groups such as the elderly and young children. The increasing frequency and intensity of heatwaves pose significant risks to public health.

**Flood-Related Mortality**: Flooding events have also led to casualties, with several deaths reported in areas affected by severe waterlogging. The lack of preparedness in low-lying areas, particularly informal settlements, has heightened the risks faced by vulnerable populations.

### Displacement

**Flood-Induced Displacement**: Flooding along the Ayad River and other low-lying areas of Udaipur has led to temporary displacement of families, particularly those residing in informal settlements. Displacement disrupts access to essential services, including healthcare and education for children, and often forces families to seek shelter in overcrowded and unsafe conditions.

**Impact on Informal Settlements**: Informal settlements, with inadequate infrastructure and poor drainage, are highly susceptible to flooding. Residents in these areas often face repeated displacement, compounding the challenges of rebuilding their lives and livelihoods after each event.

### Increased Health-Related Issues

**Post-Flood Health Burden**: Flooding has increased the prevalence of waterborne diseases such as diarrhea and dengue, particularly in children. The health burden in informal settlements is especially high, as inadequate sanitation and water management exacerbate the spread of infections during and after flooding.

**Heat-Related Health Issues**: The rising frequency of heatwaves has resulted in an increase in heat-related illnesses, particularly among young children and the elderly. In 2023, Udaipur recorded over 400 cases of heat-related illnesses, including heatstroke.

### Socio-Economic Inequality

**Unequal Access to Services**: Vulnerable populations, particularly those living in informal settlements, have limited access to early warning systems, healthcare, and relief during extreme weather events. This lack of access exacerbates socio-economic inequalities, as those with fewer resources are less able to recover from the impacts of floods and heatwaves.

### Loss of Ecosystem Services and Biodiversity

**Degradation of Green Spaces**: Udaipur's green cover is rapidly declining, further increasing the city's vulnerability to extreme heat. Green spaces such as parks and lakes, which provide relief from heat and improve air quality, are being lost to urbanization. This loss reduces the city's resilience to the urban heat island effect, particularly affecting children who rely on these areas for recreation and physical activity.

**Summary table of economic and non-economic loss and damage in Udaipur.**

| Sl. No. | Economic Loss and Damage | Non-Economic Loss & Damage |
|---|---|---|
| 1 | Trade | Loss of life |
| 2 | Loss of infrastructure | Displacement |

| Sl. No. | Economic Loss and Damage | Non-Economic Loss & Damage |
|---|---|---|
| 3 | Loss of property | Increased health-related issues / burden on the health systems |
| 4 | Loss of livelihoods | Heat related losses |
| 5 | - | Loss of community resilience |
| 6 | - | Socio-economic inequality |
| 7 | - | Loss of ecosystem services and biodiversity |

## 3.3 Loss and Damage Assessment for Young Children and Pregnant Women in Udaipur

Young children (0-6 years) and pregnant women are highly vulnerable to the impacts of extreme weather events such as floods and heatwaves. These events exacerbate health risks, nutritional deficiencies, and accessibility to essential services, further deepening socio-economic inequalities. The loss and damage experienced by these groups highlight the need for urgent policy interventions to build climate resilience in healthcare, education, and community infrastructure, while ensuring the protection of the most vulnerable.

### 3.3.1 Health Impacts

#### Vector, Water, and Airborne Diseases

**Increase in Vector-Borne Diseases**: Flooding and Waterlogging in low-lying colonies like Ayad, Nela Talab, and Roop Sagar create breeding grounds for mosquitoes, leading to a significant rise in vector-borne diseases like malaria and dengue. Post-monsoon, these areas report a surge in cases, severely affecting young children, who have weaker immune systems. In Mallah Talai and Alipura, stagnant water after flooding intensifies mosquito breeding, leading to outbreaks of diseases, particularly in households without proper sanitation.

**Waterborne Diseases**: During heavy rainfall and flooding in areas like Khempura, Bhilurana kacchi basti Area, Savina, Bohra Ganeshji- Pratap Nagar road and Ayad, the contamination of drinking water sources poses a severe risk of waterborne diseases such as diarrhea and cholera.

Young children in these colonies are particularly vulnerable, with a higher risk of severe dehydration and malnutrition if not treated promptly. Pregnant women in flood-affected areas are more susceptible to waterborne infections, increasing risks during pregnancy and childbirth.

**Airborne Diseases**: Increased dust, pollution, and poor air quality during extreme heat and post-flood recovery periods in Bhattiyani Chohatta (Old City), Sevashram- Pratap nagar road, Sardarpura, Shaheed Bhagat Singh Nagar, Chetak- Hathipol and Govardhan Vilas exacerbate respiratory conditions such as asthma and pneumonia. Pregnant women and young children, especially in colonies with poor waste management, suffer from aggravated respiratory issues due to the rise in airborne pollutants, which can lead to chronic health problems.

Hindi News / Local / Rajasthan / Jaisalmer / 1.94 Lakh Malnourished Children In Rajasthan, Most In Udaipur

राजस्थान में 1.94 लाख कुपोषित बच्चे, सबसे ज्यादा उदयपुर में

बच्चों को कुपोषण से बचाने के लिए प्रदेश सरकार कई स्तर पर प्रयास कर रही है। बावजूद इसके राज्य में अब भी 1.94 लाख बच्चे कुपोषित हैं। राज्य में आई ताजा पोषण ट्रेकर रिपोर्ट के अनुसार सबसे अधिक 12976 कुपोषित बच्चे उदयपुर में लिस्टेड हुए हैं। सबसे कम कुपोषित बच्चे 2246

### 3.3.2 Nutritional Impacts

**Worsening Malnutrition**: Extreme weather events, such as heatwaves and floods, disrupt food supplies and reduce access to nutritious food. These disruptions worsen malnutrition among young children, who are already at risk of stunting, wasting, and being underweight. Pregnant women, particularly those from low-income families, face food insecurity during such events, which increases the risk of delivering underweight babies.

Hindi News ▸ राजस्थान न्यूज़ ▸ bad condition of Anganwadi Centers in Udaipur rajasthan

उदयपुर: नौनिहालों की बाड़ियों के बदहाल होते आंगन, कई केंद्रों पर बच्चों के लिए नहीं पहुंच रहा पोषाहार

कई आंगनबाड़ी केंद्रों पर बिजली-पानी तक की व्यवस्था नहीं हैं तो कई किराए के भवनों में संचालित हो रहे हैं। 45 डिग्री तापमान के बीच इन आंगनबाड़ी केन्द्रों पर बच्चों के लिए पोषाहार तक नहीं पहुंच रहा है।



**Impact on Anemia**: Anemia already prevalent among young children and pregnant women in Udaipur, worsens due to inadequate access to iron-rich foods during extreme events. Anemia increases vulnerability to infections and compromises the health of both mothers and children.

### 3.3.3 Delay in Referral Services

**Interrupted Access to Healthcare**: During floods and heavy rainfall, accessibility to healthcare services, including referral services for pregnant women and children, is severely impacted. Delayed access to emergency care, antenatal care, and postnatal services can result in higher rates of maternal and child

mortality. Roads leading to healthcare facilities are often inaccessible, which puts both pregnant women and young children at high risk.

**Closure of PHCs & AWCs**: Primary Health Centres (PHCs) and AWCs, which provide essential healthcare, nutrition, and preschool education services to young children and pregnant women, often close during extreme weather events. This interruption not only limits access to essential services but also affects the overall development of children during their formative years.

> **Weather News: सर्दी के तेवर तीखे, स्कूलों के बाद अब आंगनबाड़ी केन्द्रों में भी शीतकालीन अवकाश बढ़ाया**
>
> weather News Today: तेज सर्दी के मद्देनजर सभी आंगनबाड़ी केन्द्रों में शीतकालीन अवकाश को बढ़ा दिया गया है। इस संबंध में समेकित बाल विकास सेवाएं निदेशक ने आदेश जारी किए हैं।

### 3.3.4 Education Loss

**Disruption of Early Childhood Education**: During extreme heat events, the Integrated Child Development Services (ICDS) often directs the closure of AWCs for pre-school activities, sometimes extending for a week or more. In Udaipur city, where over 80% of AWCs lack electricity and have small, poorly ventilated spaces, the AWCs become unbearably hot, putting both children and caregivers at risk. Prolonged exposure to such high temperatures heightens the chances of heat-related illnesses, necessitating the closure of these AWCs. This disruption impacts early childhood education, causing children to miss key developmental learning opportunities, potentially hindering cognitive growth. Without access to a safe, cool, and child-friendly environment, their ability to focus and engage in learning activities is significantly impaired.

In flood-prone areas like Ayad, Nela Talab, and Roop Sagar, AWCs are often forced to close during heavy rains and urban flooding. This not only disrupts the regular delivery of early childhood education but also deprives children of a stable, safe learning environment. Young children miss out on critical developmental activities, leading to delays in cognitive, social, and motor skills development. For many, these gaps in foundational learning during such formative years can result in longer-term challenges, including difficulty transitioning to formal schooling.

**Lack of Safe Play Areas**: Extreme weather events such as floods and heatwaves significantly impact children's access to safe outdoor play areas. In Udaipur, many parks and playgrounds are ill-equipped to handle these environmental changes, leading to various issues that disrupt children's opportunities for physical activity and play-based learning, both essential for their overall development. During heavy rains, parks in low-lying colonies like Ayad, Alipura, Pulaan, Sardarpura and Mallah Talai often experience severe waterlogging, creating hazardous conditions that render these areas unusable for extended periods. This not only prevents physical activity but also increases the risk of slips, falls, and injuries. Furthermore, the stagnant water attracts insects, creating an environment conducive to mosquito breeding and raising the risk of vector-borne diseases like dengue and malaria, which particularly affect vulnerable populations, including young children. The lack of green corridors and safe pathways exacerbates these challenges, limiting children's access to healthy recreational spaces and further hindering their physical and social development.

### 3.3.5 Safety and Protection issues

During extreme heat events, children are at heightened risk of heat-related illnesses, particularly in poorly ventilated environments such as overcrowded homes or Anganwadi centers lacking cooling systems. For instance, in colonies like university road, Old city, Govardhan vilas, Savina and Machhla Magra, where temperatures can soar, children often experience dehydration, heat exhaustion, and

heat strokes, leading to severe health complications. Additionally, during urban flooding, the safety of children is further compromised as they may be displaced from their homes, leading to exposure to hazardous conditions. Floodwaters can carry debris and pollutants, creating unsafe environments that threaten their well-being.

### 3.3.6 WASH related issues

Moreover, urban floods exacerbate WASH-related issues, severely limiting children's access to clean water and sanitation facilities. The flooding can contaminate water sources, leading to outbreaks of waterborne diseases such as diarrhea and cholera, which disproportionately affect young children with developing immune systems. For instance, areas like Mallah talai, Sajjan nagar, Sector 09, MIA, Ayad and Neemach Mata (Dewali) often face waterlogging, making it difficult for families to access safe drinking water and proper sanitation. Inadequate hygiene practices in the aftermath of flooding can also lead to increased risks of infections and illnesses. Furthermore, the loss of functional WASH facilities in schools and community centers limits opportunities for safe water and sanitation, impacting children's health and educational experiences. The cumulative effects of extreme heat and flooding create a cycle of vulnerability that hinders the physical and emotional development of young children in Udaipur.

### 3.3.7 Loss of Cultural Identity Due to In-Migration

**Displacement and Migration**: A significant number of low-income families with children migrate to Udaipur from nearby villages and districts. Extreme weather events, often force families—especially those living in low-lying and vulnerable areas—to seek safer locations. This displacement disrupts the cultural and social fabric of communities, resulting in a loss of cultural identity for young children. Pregnant women, who rely on community support systems, may experience social isolation, further affecting their mental health during this vulnerable period.

**Breakdown of Community Support Networks**: Migration disrupts traditional support systems for childcare and cultural practices related to childbirth and child-rearing. The loss of social and cultural cohesion can increase stress for pregnant women and negatively impact children’s sense of belonging and identity.

### 3.3.8 Impact on Family Livelihoods and Economic Loss

**Loss of Income and Employment**: Families reliant on daily wages or informal work face economic hardship during and after extreme weather events, directly affecting their ability to provide for young children and pregnant women. Loss of income during floods or heatwaves leads to reduced spending on healthcare, nutrition, and education, increasing vulnerability for these groups.

**Increased Health Expenditures**: Health-related costs rise significantly due to climate-related illnesses. For poor families, increased healthcare expenditures due to vector-borne, waterborne, and heat-related illnesses result in reduced ability to afford other basic needs for pregnant women and children.

### 3.3.9 Children at Construction sites

In Udaipur, particularly in vulnerable locations such as Navratna Complex, Bhuwana, Sukher, Pratap Nagar, Sector 11, Sector 14, and Govardhan Vilas, a significant number of young children, especially from low-income families, are often found at construction sites due to economic necessity. These children face

numerous challenges related to health, nutrition, protection, WASH (Water, Sanitation, and Hygiene), and preschool education, particularly during extreme heat and urban flooding. The health risks are particularly concerning, as children are vulnerable to heat-related illnesses like dehydration and heat exhaustion due to high temperatures at construction sites. Additionally, the hazardous nature of these environments exposes them to accidents and injuries, while poor air quality from dust and pollutants can lead to respiratory issues.

# 4 Stakeholder engagement and thematic analysis

Stakeholder engagement is integrated throughout the research processes of the project. For work package 1, our strategy for stakeholder engagement aims to gather community insights regarding the effects of climate change in Udaipur. This engagement will unfold through Focus Group Discussions (FGDs), focusing on understanding the contextual risks, vulnerabilities, and specific losses experienced by the communities.

## 4.1 Focus Group Discussions (FGDs)

We intend to conduct four FGDs in the city. These discussions will be categorised as follows:

FGD 1: This session will involve a discussion with the city-level government officials, engaged in preparedness, response, and recovery phases in the cities.

FGD 2: This session will involve community-based organisations (CBOs) engaged in response and recovery initiatives.

The primary goal of the FGDs is to collect comprehensive contextual information regarding climate-related losses faced by the communities, and how the city manages the damage and loss. We expect the CBOs to be able to dive deeper into case studies and nuanced understanding of the community, while the government officials to be able to give a more programmatic city-level gauge of how loss and damage is assessed and managed officially. Collectively, we will be able to identify aspects of loss and damage contextual to the city, their current state of management with the city officials, and potential gaps and opportunities to develop and integrate L&D assessment and management methods in the city climate plans and DRR plans.

**Objectives:**

- To comprehend community views on the effects of climate change.
- To gather information on specific values lost due to climate-related events.
- To identify critical community values that are at risk.
- To explore the complexities of losses incurred by communities due to climate change within the cities.

## 4.2 Stakeholder Interviews

Building on insights from the CBOs, we will conduct interviews of the members of the community, especially from the vulnerable groups. Here, we will adopt a case-study approach, engaging specific community members to obtain in-depth insights into the impacts of climate change on their livelihoods and overall quality of life.

### 4.2.1 Stakeholder Identification and Recruitment:

Participants for FGD 1 will consist of officials of departments that are part of the disaster response and recovery processes, and are (or should be) part of loss and damage assessment and management at the city level. For FGD 2, will consist of local CBOs experienced in the impacts of climate change on the communities living in the city. The recruitment for both FGDs will be done based on our network in the city, and will follow a purposive sampling method, bringing in participants with experience and knowledge on impact of climate change on the local communities.

We will conduct a stakeholder mapping exercise for Public-sector officials in departments that are involved in response and recovery for FGD 1. For FGD 2, we will map local CBOs working directly with communities in the response and recovery phases, and CBOs/research organisations with regional experience on climate change impacts on the city. For interviews, we will identify community members with direct historical impact of climate change & associated disasters. These can include community leaders of impacted communities, community volunteers who participated in response and recovery (including youth voices), and representatives of vulnerable groups within the community (women, elderly, disabled population). We will target community members directly affected by climate change, particularly vulnerable groups such as women, the elderly, and individuals with disabilities.

These participants will be identified through our focused outreach to the selected community, through our networks of CBOs working in the cities at the community level. We will aim to bring forth 8-10 participants per FGD, and to conduct 5-10 interviews.

### 4.2.2 Engagement Approach:

The FGDs will commence with an introduction and an icebreaker, followed by targeted questions relevant to each group's focus. Facilitators will moderate the discussions, and data will be collected through note-taking and audio recordings, ensuring confidentiality and informed consent.

The FGDs will be focused on the following questions:

**FGD 1: Public Sector Officials**

- What are the key risks from climate change faced by the communities in the city?
- How do the different departments prepare, respond to, and assess the loss and damage of disasters in the city?
- What aspects of loss and damage are most pertinent in your experience?
- What are the on-ground challenges in executing the SOPs of disaster impact assessment?

**FGD 2: CBOs**

- What are the key risks from climate change faced by the communities in the city?
- Looking back 10-20 years, what losses have the community experienced?
- What has been the scale of these identified losses?
- What does the recovery from these losses look like for the community?

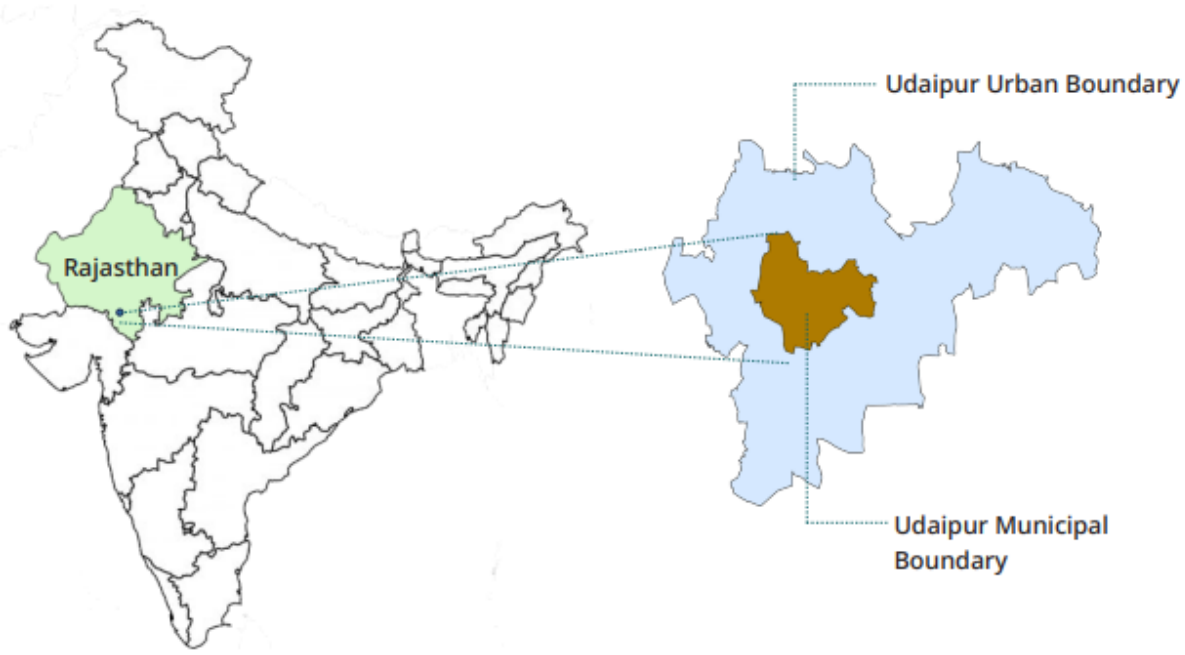
The interviews will be in an unstructured format, with broad questions to jumpstart the conversation, followed by questions building on the previous responses. This unstructured approach will help provide

more space and comfort to the community members to share their experiences in their preferred narrative. We will create an interview guide to ensure all principles of the ethical interview process are met, including but not limited to informed consent, cultural sensitivity, transparency, and comfort of participants.

### 4.2.3 Data Collection and Analysis:

The data gathered from the FGDs & interviews will be transcribed, anonymized, and analysed thematically using coding software like NVivo. This analysis will provide critical insights into the community-specific loss and damage aspects that will inform our broader thematic analysis.

# 5 City Profile




Udaipur, one of India's oldest cities, is renowned both nationally and internationally as the "City of Lakes." Founded by Maharaja Udai Singh in 1559 as the capital of the Mewar kingdom, the city holds historical significance and continues to be a cultural hub. Established as a municipality in 1922, Udaipur was elevated to the status of Udaipur Municipal Corporation (UMC) in April 2013. In 2015, Udaipur was among the first 20 cities selected under the Government of India's Smart City Mission (SCM), reflecting its importance in urban development.

The vision for Udaipur Smart City is "Eternal Udaipur: World's favourite Lakeside Heritage City." The initiative aims to modernize essential service infrastructure to enhance the quality of life for residents while preserving its iconic lakes and cultural heritage. Additionally, the city seeks to boost investment and tourism through smart city projects, ultimately strengthening the local economy and positioning Udaipur as a leading destination for heritage and modern urban living.

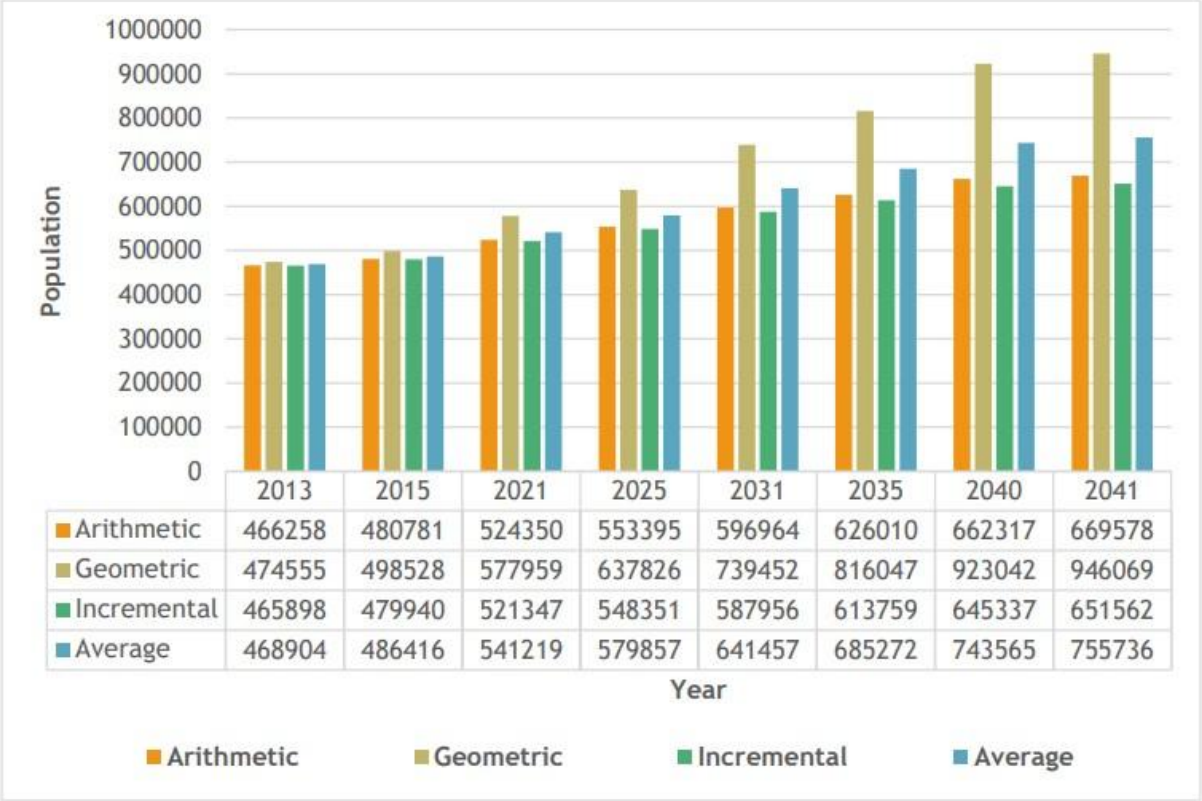
Udaipur, covering an area of 64 square kilometers, serves as the administrative capital of the district and is the only municipal corporation within it. The city is divided into 70 election and revenue wards, located between 24°28'49" and 24° 42' 56" N latitudes and 73°36'51" and 73° 49' 46" E longitudes, with an altitude of 598 meters above mean sea level. Surrounded by hills and lakes, Udaipur's growth is currently concentrated towards the northeast and west, along National Highways NH8 and NH76.

Over the past two decades, Udaipur has experienced significant development due to the establishment of industrial, administrative, and educational centers. Known for its rich history, culture, and scenic beauty, Udaipur is a major tourist destination, famed for its Rajput-era palaces and being the “City of Lakes.” Its sophisticated lake system includes five major lakes—Fateh Sagar Lake, Lake Pichola, Swaroop Sagar Lake, Goverdhan Sagar, and Doodh Talai Lake—making it a symbol of natural beauty and architectural grandeur.

## 5.1 Demography

The population of Udaipur city is 451,100 (total 233,959 males and 217,141 females) as per census 2011. As per UMC present population of Udaipur Municipal area is approximately 0.5 million. As per the CDP the city has witnessed considerable population growth in the last four decades while acting as a major economic hub for the surrounding region. The growing economy and growing tourism sector have attracted both urban as well as rural populace. The city has witnessed high growth rate during 1971-1981 and 1981-1991. The decadal growth rate from 2001 to 2011 was 15.83% which is near to the natural growth rate of the population. It has reduced from previous decades, due to growth of outer peripheral areas. The population density of Udaipur city is 7,048 persons per sq. km as per Census 2011. The floating population of the city is 16,000 as per 2011 census. Udaipur has now become a renowned major tourist destination of India, as per the Tourism Progress Report 2019-20 prepared by Tourism Department Rajasthan 11,36,947 national and international tourists visited Udaipur in 2018. Historical tourism data of the decade 2011- 2020 shows that the overall tourist population has grown by 40% with an average growth rate of 6% annually.

The projected population for Udaipur city in 2021 (based on 2011 population) is estimated to be 0.54 million (5.41 lakhs) and 0.64 million (6.41 lakhs) in the years 2031.




| | 2013 | 2015 | 2021 | 2025 | 2031 | 2035 | 2040 | 2041 |
|---|---|---|---|---|---|---|---|---|
| Arithmetic | 466258 | 480781 | 524350 | 553395 | 596964 | 626010 | 662317 | 669578 |
| Geometric | 474555 | 498528 | 577959 | 637826 | 739452 | 816047 | 923042 | 946069 |
| Incremental | 465898 | 479940 | 521347 | 548351 | 587956 | 613759 | 645337 | 651562 |
| Average | 468904 | 486416 | 541219 | 579857 | 641457 | 685272 | 743565 | 755736 |

*Table: Population growth and Projection for Udaipur and City Agglomeration*
*(Source: Udaipur City Guide; 2020- UMC)*

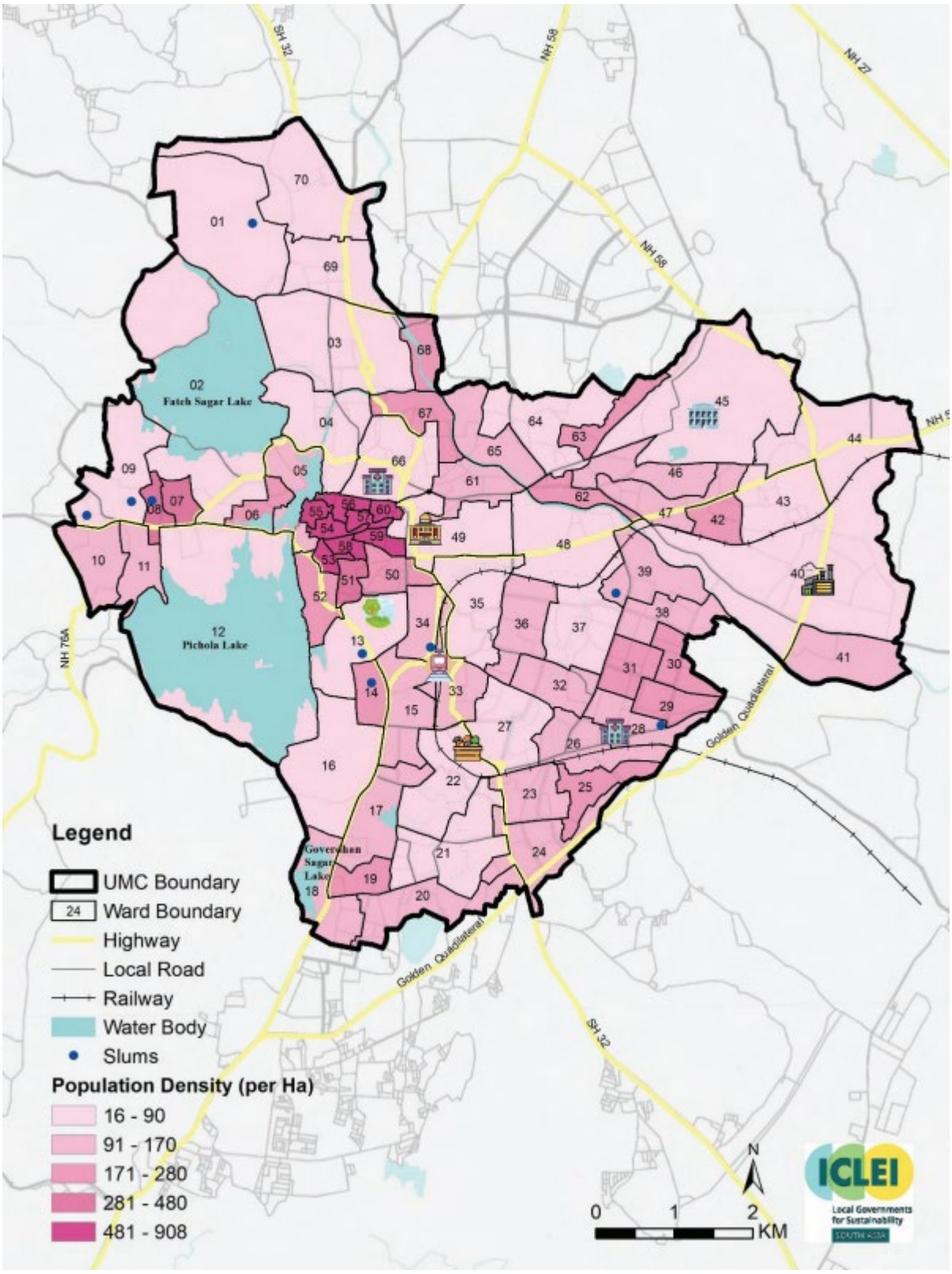
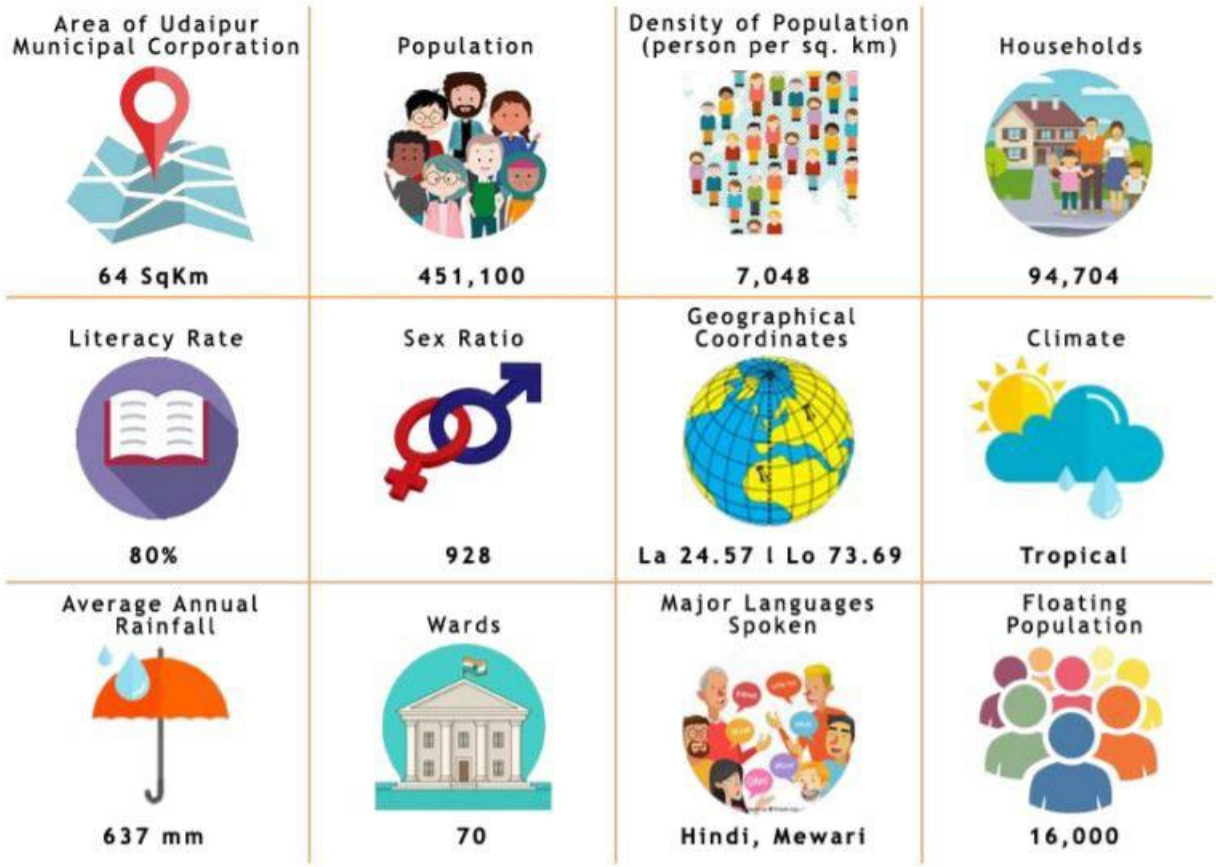



*Figure 6 Population density map of UMC highlighting identified slum locations (Source: CRCAP Udaipur 2024)*

| SN | Particular | Details |
|---|---|---|
| 1 | City | Udaipur |
| 2 | Government | Municipal Council (Udaipur Municipal Corporation) |
| 3 | State | Rajasthan |
| 4 | City Area (UMC) | 64 Sq Km. (25 Sq Miles) |
| 5 | Total Wards (Municipal Area) | 70 |
| 6 | City Population (Census 2011) | 4,51,100 (Total); 2,33,959 (M) 2,17,141 (F) |
| 7 | Children (0-6 Years) (Census 2011) | 47,932 (Total); 25,691 (M), 22,241 (F) |
| 8 | Average Literacy (%) | 89.66% (Total); 94.47% (M), 84.52% (F) |
| 9 | Sex Ratio | 928 |
| 10 | Child Sex Ratio | 866 |
| 11 | Children age 12-23 months fully immunized (BCG, Measles and DPT) | 93.4% (RMRS 2020-21); 43.9% (NFHS-4, 2015-16) |
| 12 | Total Public Parks in City | 200 |
| 13 | AQI Level of Udaipur range (Average) | 70-200 (Moderate) |
| 14 | Total length of Roads (UMC Area) | 1585 Kms |
| 15 | Total AWC (UMC Area) | 150 |
| 16 | Total Pre-Primary, Primary Schools (Urban Area) | 355 |

*Source: UMC-Udaipur City Profile 2019-20, Census 2011, NFHS-4, RMRS Health Bulletin 2020-21*



| SN | Urban Infrastructure Service | Planning, design, Implementation | Management and maintenance |
|---|---|---|---|
| 1 | Water Supply | PHED | PHED |
| 2 | Sewerage | UMC/ UIT/ PHED | UMC/ UIT/ PHED |
| 3 | SWM and Drainage | UMC | UMC |
| 4 | Urban Transport | UMC | UMC |
| 5 | Street Lighting | UMC/ UIT | UMC/ UIT |
| 6 | Environment Protection | RPCB | RPCB |
| 7 | Urban Poor Settlements | UMC, UIT | UMC, UIT |

*Source: UMC-Udaipur City Profile 2019-20*

## 5.2 Road Network

Udaipur has 11 arterial roads and 26 sub-arterial roads, connecting the major residential areas to other areas of the city. A major road in the city includes Hathipole, Surajpole, Delhi Gate Chauraha, Udaipole Chauraha, and Chetak Circle. Most of these roads cater to Intra and inter-city traffic and have high vehicular movement. About 5% of road length has over 35 M right of way (ROW), 14% has ROW of 20 M to 30 M, 56% has ROW between 10 M to 20 M, and the rest 23% roads have ROW below 10 M.

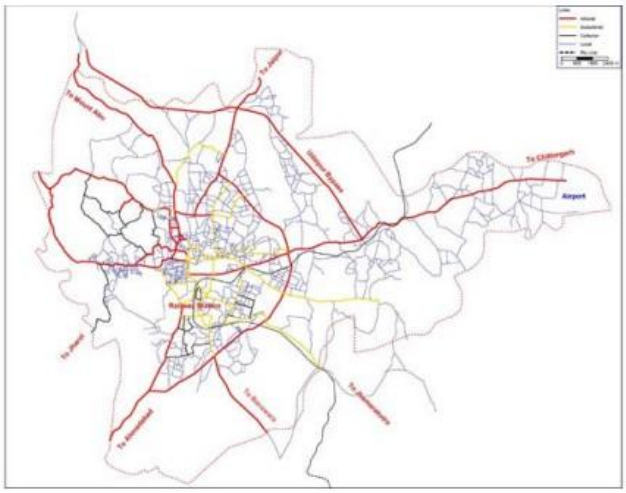


*Fig: Road Network, Udaipur (Source – Interim CDP, Udaipur 2014)*

| Road Category | Length (KM) | Width of the road (Mt) | % to Total |
|---|---|---|---|
| Arterial Roads (NH, SH) | 85 | 30 to 50 | 4% |
| Sub Arterial Roads | 223 | 20 to 30 | 16% |
| Collector roads | 365 | 15 | 18% |
| Other roads | 912 | 10 | 62% |
| Total length of the Roads | 1585 | | 100% |

*Figure 7 Road Network ( Source CDP 2014)*

## 5.3 Vehicular Growth

Number of registered vehicles in Udaipur has increased from 290567 in 2001- 11 to 571350 in 2015- 16, i.e., an average growth rate of 7% per year, which is lesser than the country's vehicular growth rate. Among these, 2 wheelers constitute about 78% of total registered vehicles. Cars constitute 9% while buses constitute only 1% of the total registered vehicles.

Year-wise vehicle population in RJ27- Udaipur as of March 2020 (Vahan Data only)
RTO/ ARTO: RJ27- Udaipur, Data Updated Date: March 2020 (Source- RTO, Udaipur)

| SN | Type of Vehicle | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|---|---|---|---|---|---|
| 1 | **Goods Vehicles** (Truck, Lorries, Tanker, 3-wheeler, E-rickshaw with cart) | **2372** | **1704** | **2023** | **1936** |
| 2 | **Passenger Vehicles** (Buses, Cars, Taxi cab, School bus, Ambulance, Jeep, 3-wheeler auto-rickshaw, E-rickshaw) | **2586** | **11454** | **11704** | **11709** |
| 3 | **2-wheeler** (Motorcycle, Scooter, Mopeds) | **54507** | **54643** | **64160** | **64077** |
| 4 | **Tractor** | **1132** | **1448** | **1347** | **1601** |
| 5 | **Trailer** | **-** | **20** | **2** | **3** |
| 6 | **Others** (JCB, Crane, Loader etc) | **264** | **1189** | **1198** | **663** |
| | **TOTAL** | **60861** | **70460** | **80434** | **79989** |

## 5.4 Air Quality

The major sources of air pollution in Udaipur are vehicular emission, road dust, construction activities, industrial emissions etc. PM10, PM2.5 and SO2 has been identified as main air pollutants as these are found to be above the prescribed national standards. This indicates that the air is harmful and may bring discomfort to children, elderly people and people with heart diseases and lung diseases such as asthma. This is mainly due to re-suspension of road dust, emission from vehicles, D.G. sets, construction activities, open burning of solid wastes (sometimes), transportation of construction materials such as 18 sands, soil etc. without covering and emission from industrial areas situated in and around Udaipur (Madri and RIICO), emissions from marble mining and cutting. According to the recently released figures by RSPCB for first six months of 2018, the level of pollution in Madri Industrial area of Udaipur was much higher than Delhi from February 2018 to May 2018. It has also been noted that in the industrial area, the level is three times higher than normal and it can be extremely harmful to the inhabitants of these areas. NO2 also has been observed at an alarming level. This is mainly due to vehicular emissions. Plying of old vehicles and traffic congestion causes higher level of NO2. It has been observed that air quality of Udaipur during winter season becomes very poor & severe due to condensation of fine particulate matter in the lower portions of the atmosphere. AQI level of Udaipur range in between 70 to 200, which is in moderate range as per the NAQI level CPCB.

| Udaipur CAAQMS Yearly Average Report, From July- 2017 to Sep 2018 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | NO | $NO_2$ | $NO_x$ | $NH_3$ | $SO_2$ | CO | $O_3$ | $PM_{10}$ | $PM_{2.5}$ | Benzene | Toluene | Ethyl Benzene | MP Xylene | O Xylene |
| | µg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ | mg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ | µg/m³ |
| Jul-17 | 12.85 | 19.47 | 32.29 | 8.70 | 2.41 | 0.87 | 27.89 | 66.23 | 23.53 | 1.08 | 8.22 | 0.45 | 1.63 | 0.71 |
| Aug-17 | 12.16 | 16.86 | 28.94 | 5.97 | 2.39 | 0.88 | 23.91 | 81.26 | 28.94 | 0.93 | 8.88 | 0.72 | 2.41 | 0.94 |
| Sep-17 | 11.85 | 23.38 | 35.15 | 11.71 | 5.95 | 1.00 | 30.87 | 83.62 | 23.99 | 1.08 | 5.75 | 1.02 | 1.81 | 0.66 |
| Oct-17 | 24.33 | 40.84 | 64.96 | 11.71 | 5.56 | 1.28 | 29.75 | 126.41 | 56.55 | 2.31 | 3.56 | 2.03 | 3.30 | 1.66 |
| Nov-17 | 33.31 | 49.34 | 82.51 | 22.11 | 5.89 | 1.68 | 38.27 | 170.59 | 92.32 | 5.89 | 8.23 | 4.32 | 14.34 | 6.69 |
| Dec-17 | 43.77 | 53.97 | 97.23 | 48.32 | 7.90 | 1.72 | 19.05 | 190.81 | 77.31 | 14.47 | 20.80 | 10.47 | 34.51 | 16.32 |
| Jan-18 | 32.73 | 41.20 | 73.52 | 43.43 | 11.67 | 1.69 | 28.31 | 172.20 | 79.46 | 6.26 | 9.01 | 4.54 | 10.31 | 5.26 |
| Feb-18 | 21.54 | 24.69 | 46.24 | 34.50 | 13.02 | 1.39 | 28.67 | 124.18 | 66.79 | 3.88 | 6.03 | 5.03 | 6.88 | 5.26 |
| Mar-18 | 17.25 | 26.71 | 43.86 | 26.24 | 7.88 | 1.19 | 35.98 | 128.70 | 68.87 | 2.00 | 2.68 | 1.99 | 3.92 | 2.14 |
| Apr-18 | 13.71 | 25.89 | 39.54 | 23.13 | 10.73 | 1.15 | 43.86 | 161.06 | 60.24 | 1.74 | 2.22 | 1.35 | 2.85 | 1.45 |
| May-18 | 12.25 | 25.10 | 37.28 | 14.48 | 12.53 | 1.15 | 42.98 | 166.40 | 65.94 | 1.65 | 3.72 | 1.00 | 2.84 | 1.39 |
| Jun-18 | 13.82 | 27.29 | 40.94 | 21.88 | 14.17 | 0.93 | 30.41 | 104.44 | 49.78 | 1.27 | 3.04 | 1.23 | 2.62 | 1.65 |
| Jul-18 | 18.60 | 17.87 | 36.07 | 40.77 | 8.60 | 0.85 | 31.09 | 116.05 | 41.97 | 1.26 | 2.27 | 0.94 | 2.54 | 1.39 |
| Aug-18 | 16.40 | 18.80 | 35.08 | 47.07 | 8.48 | 0.73 | 23.34 | 87.42 | 36.02 | 1.34 | 0.87 | 2.42 | 0.99 | 2.12 |
| Sep-18 | 16.29 | 20.17 | 36.34 | 18.50 | 5.54 | 1.05 | 30.40 | 70.64 | 30.14 | 1.13 | 0.79 | 2.43 | 0.61 | 1.72 |
| | | | | | | | | | | | | | | |
| Minimum | 11.85 | 16.86 | 28.94 | 5.97 | 2.39 | 0.73 | 19.05 | 66.23 | 23.53 | 0.93 | 0.79 | 0.45 | 0.61 | 0.66 |
| Maximum | 43.77 | 53.97 | 97.23 | 48.32 | 14.17 | 1.72 | 43.86 | 190.81 | 92.32 | 14.47 | 20.80 | 10.47 | 34.51 | 16.32 |
| Average | 20.06 | 28.77 | 48.66 | 25.23 | 8.18 | 1.17 | 30.98 | 123.33 | 53.46 | 3.09 | 5.74 | 2.66 | 6.10 | 3.29 |

*Ref: Action Plan for the National Clean Air Program for UDAIPUR (UMC, Nov- 2018)*

## 5.5 Economic Activities

Udaipur serves as the regional headquarters for southern Rajasthan, encompassing five districts. The city is home to various state and regional public offices, including the Director of Mines and Geology, Commissioner of Excise, and Commissioner of Tribal Area Development, along with Hindustan Zinc Limited and the Rajasthan State Mines and Mineral Corporation Limited. Additionally, it hosts several district offices, such as the Collectorate, Public Works Department, and the Office of Senior Town Planner. Udaipur's economy is diverse, with substantial contributions from the tourism, trade and commerce, and industrial sectors. Furthermore, Udaipur is recognized as an educational hub, featuring three universities, six colleges, and over 160 high schools.

As a market center for surrounding smaller towns, Udaipur boasts wholesale markets for a variety of commodities, including food grains and building materials. The Krishi Upaj Mandi serves as a centralized wholesale market for grains, while major trade areas are concentrated around Chetak Circle, Jagdish Temple Street, Hathi Pole, Bada Bazaar, and Lake Palace Road. To accommodate the growing demand for organized commercial space, the Udaipur Development Authority (UDA) has proposed the development of a large sub-city center to facilitate the decentralization of commercial activities from the historic walled city. Udaipur is also a significant tourist destination, known for its picturesque landscapes, lakes, and historical significance, attracting around one million visitors annually. In 2022, the city welcomed

1,532,905 national and international tourists, marking a 23% increase in 2023, which has placed additional pressure on urban infrastructure and services, highlighting the need for strategic policy and infrastructure planning. The city's industrial landscape includes key areas such as Gudli and Madari, alongside Mewar IT Park, Pratap Nagar, Sukher, and Bhamashah Kaladwas. Predominantly, industries in Udaipur focus on mineral ore processing, manufacturing, chemicals, and pharmaceuticals. Notable companies include Vedanta Hindustan Zinc Ltd., Wonder Cement, and the Udaipur Marble Association, among others, contributing significantly to the region's economic landscape.

### 5.5.1 In-migration

Additionally, Udaipur experiences seasonal migration of families with young children from surrounding villages and districts, as they seek employment opportunities in various sectors, including construction, Watchmen role in industries and residentials apartments, marble cutting and polishing, and domestic work. Many of these families move to the city temporarily to secure livelihoods during peak work seasons.

In many cases, young children accompany their parents and live with their caregivers at the work sites. However, for families residing in slum areas, the situation can be different. In these cases, children often remain at home, where older siblings assume the responsibility of caring for them. This dynamic can pose challenges for both the children's welfare and the ability of families to balance work and family obligations, as older siblings may be required to forgo education to fulfill caregiving duties. As a result, this seasonal migration phenomenon has significant implications for the health, education, and overall well-being of young children within these families.

## 5.6 Main Urban Services in Udaipur & Responsibility Matrix

| SN | Urban Infra Service | Planning & Design | Organization & Management | Policy Making | Regulation |
|---|---|---|---|---|---|
| 1 | Water Supply | PHED | PHED | GoR | PHED |
| 2 | Sewerage | UMC/UDA/PHED | UMC | GoR | UMC |
| 3 | SWM & Drainage | UMC | UMC | GoR | UMC |
| 4 | Urban Transport | UMC | UMC | GoR | UMC |
| 5 | Street Lighting | UMC/UDA | UMC/UDA | GoR | UMC/UDA |
| 6 | Environment Protection | RPCB/UMC/UDA | RPCB/UMC/UDA | GoR/ MoEF | RPCB |
| 7 | Urban Poor Settlements | UMC/UDA | UMC/UDA | GoR/ GoI | UMC/UDA |
| 8 | Women and Children Health | DMHFW | DMHFW/UMC/UDA | GoR | DMFHW |
| 9 | ECCD | ICDS/DMHFW | ICDS/DMHFW/UMC | GoR/ GoI | ICDS |

# 6 Udaipur's Climate Journey

Udaipur, famously known as the "Lake City", owes much of its prominence to its picturesque lakes, which serve as the heart of its tourism-driven economy and local livelihood. The city's commitment to sustainability began as early as 1976 when the Public Health Engineering Department (PHED) initiated an underground sewerage project in the walled city to protect Pichola Lake from sewage contamination. Covering 4.93 sq. km with a 21.30 km sewerage network, this was the first significant step toward environmental preservation. In 2004-05, the Udaipur Improvement Trust (now Urban Development Authority - UDA) implemented the second phase, focusing on restoring the lakes within the old city and

extending the sewerage system. This phase covered 3.18 sq. km with a 23.50 km network and included the establishment of five sewage pumping stations.

Recognizing the critical importance of lake conservation, the Rajasthan Government proposed a comprehensive management plan under the National Lake Conservation Plan (NLCP) in 2008. Supported by a sanction of INR 1,270 million (INR 127 crores) from the Ministry of Environment and Forests and the Government of Rajasthan, the initiative aimed at sustainably managing Fateh Sagar and Pichola Lakes. Key activities included extending the underground sewer network, diverting sewage to treatment plants (STPs), constructing a 20 MLD STP, desilting, de-weeding, managing stormwater, and treating the catchment area. The UDA executed this project, which was completed in 2015, laying the groundwork for Udaipur's sustainable future. The city's transformation accelerated in 2014-15, with the launch of key national initiatives such as the Swachh Bharat Mission, AMRUT, the Smart City Mission, and PMAY. Udaipur actively participated in these schemes and was selected in the first phase of the Smart City Mission, positioning itself as a model for urban sustainability and resilience.

Projects under AMRUT's first and second phases in Udaipur have focused on critical urban infrastructure improvements, including the construction of an underground sewerage network, lake restoration, and the development of new public open spaces. Significant progress has been achieved, with the installation of 413 km of sewer lines and 70,472 households connected to the system, covering 61% of the city's area, including the Smart City's Area-Based Development (ABD) region. This network efficiently channels wastewater to sewage treatment plants (STPs), enhancing the biodiversity of the local lake ecosystem and protecting surface and groundwater from contamination. These developments have not only improved public health but also contributed to Udaipur's broader sustainability goals by safeguarding vital water resources.

The Udaipur Municipal Corporation (UMC) has also committed to a climate-resilient future through strategic planning and initiatives. A comprehensive Climate Resilient City Action Plan (CRCAP) was developed to prioritize actions that reduce energy consumption and greenhouse gas emissions. Key achievements include the construction of a 2 TPD waste-to-energy bio-methanation plant, implementation of a zero-waste pilot project, introduction of an E-rickshaw pilot program, and installation of four Ambient Air Quality Monitoring Stations (AAQMS). UMC has formed a 'climate core team' and a 'stakeholder committee' to ensure effective planning and implementation of climate strategies.

## 6.1 Climate Risk and Vulnerability Assessment

A comprehensive climate risk and vulnerability assessment for Udaipur has identified the city as highly vulnerable to climate hazards, particularly extreme heat and urban flooding. This analysis incorporated historical weather data, future climate projections, and vulnerability data sourced from local departments. Additionally, spatial analyses and extensive stakeholder discussions were conducted to ensure a thorough understanding of Udaipur's climate risks. These findings highlight the critical need for targeted adaptation and mitigation strategies to safeguard the city's infrastructure and vulnerable populations.

Udaipur is increasingly exposed to climate risks, primarily extreme heat and urban flooding, driven by rising temperatures and erratic rainfall patterns. Recent projections indicate that the city will experience more frequent and intense heatwaves, with maximum temperatures rising by 2-3°C by 2050. Over half of Udaipur's area is already considered heat hotspots, where Land Surface Temperatures exceed 37°C,

affecting nearly 64% of the population, especially children, the elderly, and outdoor workers like street vendors. Additionally, Udaipur's saucer-like topography makes it highly susceptible to urban flooding during monsoons, with low-lying areas, particularly near the Ayad River, experiencing frequent waterlogging. Projections suggest that rainfall patterns will become more erratic, with intense rainfall events leading to flash floods, affecting public infrastructure and vulnerable communities in flood-prone zones.

The most vulnerable populations include slum dwellers, who often live in poorly drained areas, and informal workers who depend on the city's outdoor spaces. Approximately 17% of Udaipur's population lives in flood-prone areas, with children and elderly residents at heightened risk. As rainfall variability increases, water scarcity may also become a pressing issue, impacting the city's water supply systems and disproportionately affecting low-income groups. These combined factors—extreme heat, urban flooding, and water scarcity—highlight Udaipur's growing vulnerability to climate change, necessitating urgent mitigation and adaptation strategies to protect its population and infrastructure.

| Urban Infrastructure Services | Vulnerability due to Urban Heat | | Vulnerability due to Urban Flood | |
|---|---|---|---|---|
| | Vulnerable Wards | Vulnerable Population | Vulnerable Wards | Vulnerable Population |
| Water Supply | 9, 40, 44, 45 | 6% of total | 3, 48, 69 | 4% of total |
| Wastewater Management | 1, 10, 21, 27, 35, 40, 48, 70 | 11% of total | 17, 35, 40, 42, 65, 68, 69 | 9% of total |
| Solid Waste Management | 1, 15, 20, 21, 22, 24, 27, 35, 37, 40, 41, 43, 44, 45, 70 | 21% of total | 35, 39, 40, 46, 48, 64, 69 | 10% of total |
| Storm Water Management | - | - | 2-5, 7, 8 12, 13 16-18, 32-41, 45-53, 55-57, 59-70 | 17% of total |
| Transportation | 75% of the total public transport stops & 46 traffic junctions are vulnerable to urban heat and 33% public transport stops & 40 traffic junctions are to urban flood. | | | |
| Emergency Services | 59% of all the hospitals and 3 out of 5 fire stations are vulnerable to urban flood. | | | |
| Air Pollution | 86% of the total population in the city is vulnerable to air pollution | | | |
| Comprehensive Vulnerability | Climate Resilient Vulnerability Assessment found ward number 40, 64 and 69 as the most vulnerable w.r.t. all 11 issues, including high LST, urban flood, high PM10 concentration, water supply, water quality, wastewater, storm water, solid waste management, road, water and vector borne disease and air borne diseases. | | | |

### 6.1.1 Vulnerability to Urban Heat

An urban heat impact analysis for Udaipur has revealed a significant and growing threat from extreme temperatures. Approximately 57% of the city is classified as heat hotspots, where land surface temperatures (LST) exceed 37°C, affecting around 64% of the population—an estimated 356,016 people

as of 2021. Key hotspots include the Madri industrial area, educational institutions such as MLSU, MPAUT, RCA, and VBRI, transportation hubs, RHB colonies in Hiran Magri, and densely populated residential areas on hilltops, where temperatures often reach between 42°C and 43°C. The assessment also identifies three particularly vulnerable groups: 64% of the general population living in these hotspots, 76% of street vendors (2,117 individuals), and a combined 29% of the population comprising young children (10.63%) and elderly residents (18.6%). These findings underscore the urgent need for targeted climate resilience measures to protect Udaipur's most at-risk communities.

### 6.1.2 Vulnerability to Urban Flooding

Udaipur's unique topography significantly contributes to its susceptibility to urban flooding. The city's saucer-like shape, as revealed through slope and elevation analysis, creates a natural basin that promotes water accumulation. This, coupled with secondary data, has identified 50 locations particularly prone to waterlogging during the rainy season. Areas near the Ayad River and the city center are especially at risk, exacerbating flood-related health hazards. The analysis indicates that urban flooding affects approximately 13% of Udaipur's total area, impacting around 17% of the population.

Certain demographic groups are particularly vulnerable, including young children (10.63% of the affected population aged 0-6) and elderly residents (18.6%). Additionally, 5,537 slum dwellers (representing 35% of the slum population) and 1,407 street vendors (51% of the total) face elevated risks due to their living and working conditions. Flooding often makes public infrastructure inaccessible, severely disrupting their daily activities and livelihoods. These findings emphasize the urgent need for comprehensive flood mitigation strategies to safeguard Udaipur’s residents and improve their resilience to future climate risks.

### Rainfall Variability

While Udaipur benefits from a monsoon-driven climate, rainfall patterns have become increasingly erratic. Climate projections predict more variability, with the potential for both more intense rainfall events and longer dry spells. This imbalance could lead to flash floods during the monsoon season and water scarcity issues during dry periods.

### Climate projections

To assess Udaipur's climate risks, historic climate data from 1970 to 2020 was analyzed, focusing on temperature and rainfall trends. According to this analysis, Udaipur has experienced a significant rise in both maximum and minimum temperatures over the past decades, with more frequent and prolonged heatwaves. Future climate projections for Udaipur are derived from the State Action Plan on Climate Change (SAPCC), Rajasthan, 2021. These projections are based on Representative Concentration Pathways (RCPs) for future emissions scenarios up to 2070. Experts have provided additional insights through stakeholder consultations conducted during the preparation of Udaipur's Climate Resilient City Action Plan (CRCAP), ensuring localized knowledge is integrated into the projections.

As highlighted in the comprehensive Climate Risk and Vulnerability Assessment, Udaipur is highly susceptible to climate hazards such as extreme heat and urban flooding. The study analyzed historical weather data, projected future climate scenarios, and vulnerability data gathered from local departments, complemented by spatial analyses and stakeholder consultations. Key findings include a significant upward trend in Udaipur's mean annual maximum temperature, with an increase of 0.60°C over the past century. Additionally, a declining trend in annual rainfall was observed, with a decrease of 11.5mm per decade between 1901 and 2016.

**Future Climatic Projections:**

**Increased Rainfall**

A 6-10% increase in overall rainfall is projected by 2050.

Monsoon rainfall is expected to rise by 40-60 mm by 2050.

Most of the increase in rainfall will occur during monsoon season.

**Extreme Weather**

Events Extreme rainfall events are likely to become more frequent and intense.

Projections indicate a 20 mm increase in maximum 1-day rainfall and a 30 mm increase in maximum 5-day rainfall by 2050.

**Rising Temperatures:**

Udaipur will experience a general warming trend due to increasing green-house gasses.

Annual maximum temperature is projected to increase by 1.75-1.85°C by 2050.

Annual minimum temperature is expected to increase by 2.1-2.2°C by 2050.

The number of hot days and warm nights is likely to rise.

**Future Climate Scenarios:**

Based on these projections, Udaipur is likely to face two major climate scenarios:

Scenario 1: Increased temperatures, heatwaves, and hot days/nights.

Scenario 2: Increased overall precipitation, with a focus on short, intense rainfall events.

*(Source: CRCAP Udaipur 2024)*

Based on the trend analysis and future projections, Udaipur is expected to witness an increase in extreme heat events and variability in monsoon rainfall, with more frequent heavy downpours leading to urban flooding. By 2050, maximum temperatures are expected to rise by 2-3°C, and intense rainfall events may become more common, further straining urban infrastructure and increasing the risk of floods in low-lying areas. This information, supported by local expertise and climate modeling, forms the foundation for Udaipur's climate scenario statements, which guide adaptation and mitigation strategies in the city's long-term resilience planning.

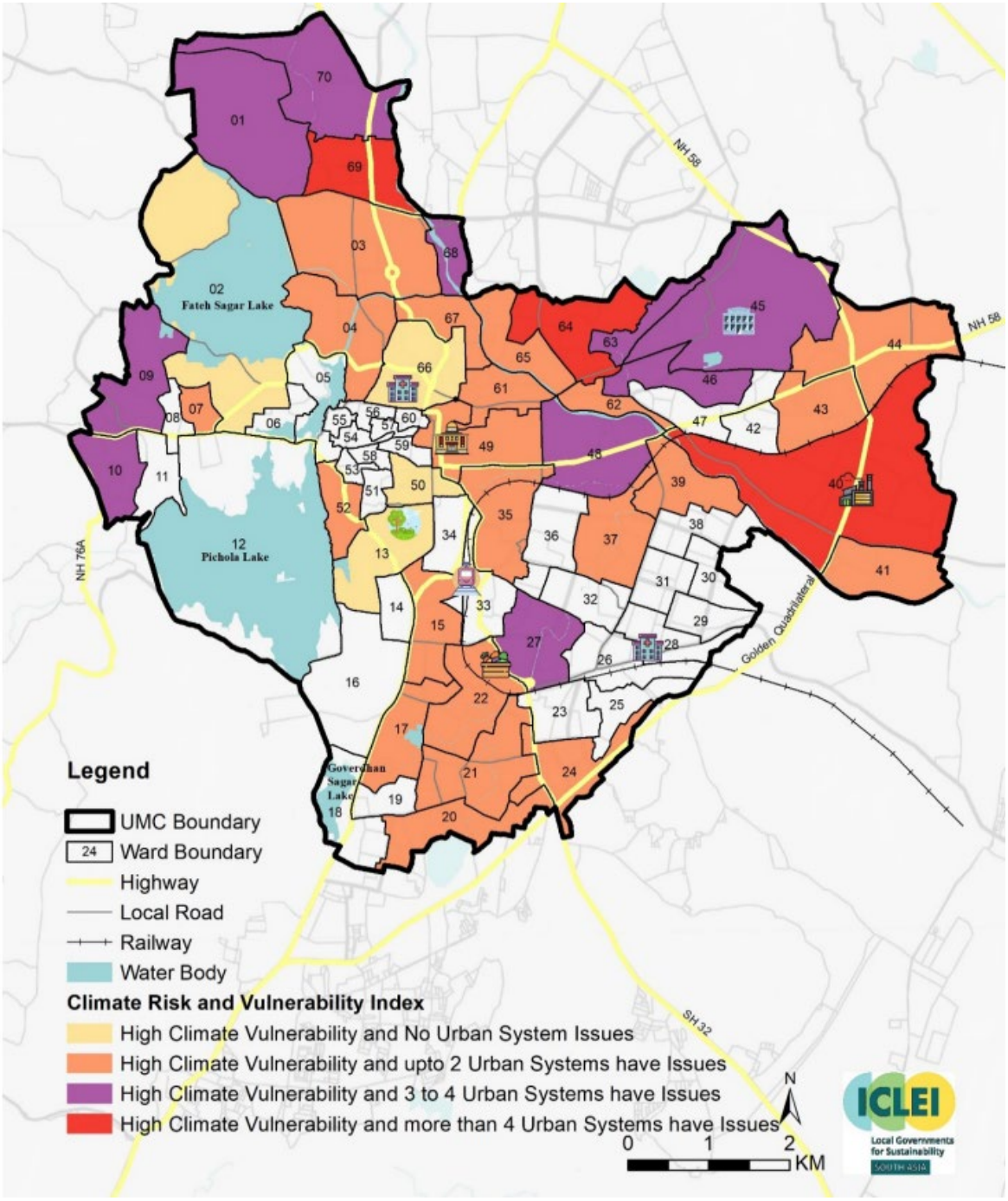



*Figure 8 Comprehensive vulnerability hot spot map of Udaipur (Source:* Net-Zero Climate Resilient City Action Plan- Udaipur 2024)

| Climate trends | Data | Source and Methodology |
|---|---|---|
| Temperature | Between 1970 and 2020, Udaipur's maximum, average, and minimum temperatures rose by 0.5 to 1°C. The number of hot days increased by 10 to 15 annually, and hot nights by 15 to 20. Meanwhile, cold days reduced by 2 to 4 days, and cold nights by 6 to 10 nights. | Based on IMD data and Rajasthan's SAPCC (2021), highlight Udaipur's growing vulnerability to heat stress, necessitating urgent climate resilience measures. |
| Land Surface Temperature | Land Surface Temperature (LST) in Udaipur ranges from 30°C to 46°C during the day and 27°C to 30°C at night. Maximum daytime LST rose from 44°C in 2015 to 46°C in 2021, while minimum nighttime LST increased from 27°C to 30°C over the same period. Currently, 57% of Udaipur's total area falls under hotspot zones, with LST exceeding the median of 37°C, affecting 64% of the population in 2021. | Temporal analysis using pixel-based statistical techniques was conducted on satellite imagery from 2015, 2018, and 2021, identifying consistent LST hotspots with temperatures above 37°C. |
| Heat Index Analysis (Feels like temperature) | Udaipur experiences heat conditions ranging from 'extreme caution' to 'extreme danger' during peak summer months, with the majority of days classified under the 'danger' category. Hotspot areas constitute 35% of the city, where feels-like temperatures exceed 43°C, impacting approximately 46% of the population. Particularly high heat index values are recorded in areas such as Madri Industrial Area, Hiran Magri, and densely populated neighborhoods, where temperatures can reach up to 50°C. | The heat index was calculated by correlating air temperature with humidity, in line with the "National Guidelines for Preparation of Action Plan – Prevention and Management of Heat Wave" by NDMA. Areas with heat index values exceeding 43°C are considered hotspots, and serve as thresholds for issuing heatwave warnings. |
| Heat Wave Events and Trend | The 1980s and 1990s saw a rise in both the frequency and intensity of heat waves, with temperatures often exceeding 40°C and reaching over 45°C in the late 1990s. In the 2000s, maximum temperatures frequently hit 42°C to 44°C during peak summer months. The decade from 2010 to 2020 witnessed a significant increase in heat wave events, with temperatures consistently crossing 45°C; notably, 2016 recorded extreme heat above 46°C. | The heat wave events and trend data for Udaipur from 1950 to 2020 were compiled using historical temperature records from the India Meteorological Department (IMD) and Climate Data Online (CDO). A historical analysis was conducted to identify trends in maximum temperatures, focusing on summer months and examining heat wave frequency and intensity across decades. |

| Climate trends | Data | Source and Methodology |
|---|---|---|
| Rainfall | For Udaipur, Rajasthan, evidence-based rainfall trend analysis shows an increase in annual precipitation ranging from 80 mm to 180 mm between 1970 and 2020. Extreme rainfall events have become more frequent, with the city experiencing an additional 2 to 3 extreme rainfall events during this period. This trend is projected to continue under varying climate scenarios, likely resulting in increased urban flooding risks due to Udaipur's geographical basin-like topography, which exacerbates water accumulation during heavy rains. These projections align with broader patterns observed across Rajasthan, where the semi-arid region is seeing greater rainfall variability. | Data sourced from IMD and long-term climate studies highlight the urgency for urban resilience measures to manage future extreme weather events. |

## 6.2 Future Climate Projections

To understand climate vulnerability and recommend effective resilience strategies, it is crucial to assess future climate projections. The analysis of Regional Climate Modelling (RCM) for Udaipur, using the A1B scenario for the near-term period (2021-2050), reveals significant changes in both rainfall and temperature patterns by 2050. Key findings include:

### 6.2.1 Rainfall Projections

- Rainfall is projected to increase by 6-10% by 2050.
- Monsoon rainfall is expected to rise by 40-60 mm by 2050, with most of the increase occurring during the monsoon season.
- A slight decrease in rainfall is projected for the winter and post-monsoon seasons by 2050.
- Extreme rainfall events are likely to become more frequent and intense, with projections indicating a 20 mm increase in maximum 1-day rainfall and a 30 mm increase in maximum 5-day rainfall by 2050.

### 6.2.2 Temperature Projections

- Udaipur is expected to experience a warming trend, with annual maximum temperatures increasing by 1.75-1.85°C by 2050.
- Annual minimum temperatures are projected to rise by 2.1-2.20°C by 2050.
- During the post-monsoon season, the mean maximum temperature could increase by 2.0°C, while in winter, it may rise by 2.25°C by 2050.
- The annual mean minimum temperature during the post-monsoon season is projected to increase by 2.8°C, and by 1.5°-2.45°C during the monsoon and summer seasons by 2050.
- The occurrence of hot days and warm nights is expected to increase.
- There is a high likelihood of mild to severe drought in Udaipur.
- Humidity levels are projected to increase by 7%, potentially exacerbating the impacts of heatwaves as temperatures rise.

The assessment above suggests that Udaipur is likely to face certain climate hazards, which are outlined below:

**Future Climate Scenario 1:** Rise in temperature, heat wave events and number of hot days and nights may increase in future.

**Future Climate Scenario 2:** An overall increase in precipitation, particularly short-duration, high-intensity rainfall events.

### 6.2.3 City level Plan and Policies related to Environment and Climate Change

| Name of the Plan | Year | Remarks |
|---|---|---|
| Low-carbon Comprehensive Mobility Plan | 2013 | Prepared under Promoting Low Carbon Transport in India project under UNEP DTU Partnership |
| City Development Plan | 2014 | Prepared under Capacity Building for Urban Development project |
| City Sanitation Plan | 2014 | Under National Urban Sanitation Policy |
| Solar City Master Plan | 2016 | Prepared by Integrated Research and Action for Development |
| Smart City Proposal | 2016 | Prepared by Udaipur Municipal Corporation |
| Low-carbon IPT Action Plan | 2018 | Prepared under SDC funded CapaCITIES project Ph I |
| Faecal Sludge & Septage Management Action Plan | 2018 | Prepared under SDC funded CapaCITIES project Ph I |
| Parking Plan and Management Strategies | 2018 | Prepared under Shakti Sustainable Energy Foundation funded project |
| Pedestrianization Plan | 2018 | Prepared under Shakti Sustainable Energy Foundation funded project |
| Climate Resilient City Action Plan | 2019 | Prepared under SDC funded CapaCITIES project Ph I |
| Clean Air Action Plan | 2019 | Prepared under SDC funded CapaCITIES project Ph II |
| Green Mobility Zone Programme | 2019 | Prepared under SDC funded CapaCITIES project Ph II |
| Child Safety Guidelines | 2023 | Prepared under Urban95 Phase II Program |
| Net-Zero Climate Resilient City Action Plan | 2024 | Prepared under SDC funded CapaCITIES project Ph II |

# 7 Loss and Damage Metrics and rationale for Inclusion

| | Vulnerable Population | Vulnerable Children (0-6 Years) | Vulnerable wards/Area | Fragility Statement |
|---|---|---|---|---|
| Extreme Heat | 64% of the total population in the city (356,016 people, 52% male and 48% female) | 37,845 Young children (10.63% of 64% of the total population) | 91% of city Area | Rising extreme heat conditions lead to thermal discomfort, reduced productivity, increased heat strokes, and heat-related illnesses. These conditions can negatively impact the economy, particularly |
| | 15,922 people live in slums and 2,117 street side | | | |

| | | | | |
|---|---|---|---|---|
| | vendors (i.e. 76% of the total vendors in the city) work in the vulnerable areas. | | | affecting vulnerable populations. Additionally, higher demand for water and energy for cooling in buildings is expected. |
| Urban Flood | 17% of the total population in the city (Total 0.95 million people – 52% male and 48% female) | 8,512 Young children (10.63% of 17% of the total population) | 13% of city area Ward No: 2-5, 7, 8, 12, 13, 16-18, 32-41, 45-53, 55-57, 59-70 | Increase in extreme rainfall events, coupled with limited and/or compromised storm water network capacity leads to waterlogging and flooding issues in the city, impacting not only urban infrastructure and property, but also livelihoods and public health. The health and livelihood of vulnerable population groups are especially impacted; urban poor are highly vulnerable due to poor living conditions and limited means. |
| Air Pollution | **Vulnerability:** Average annual PM10 concentration in Udaipur is 138 µg/m3, respectively. Kids, Elders, Street side vendors, slum dwellers in poor housing conditions, transport operators, traffic police, small shop keepers, construction labourers, etc. are at high risk due to increase in air pollution.<br><br>**Public transport:** 47 Public Transport stops (78% of total stops).<br><br>**Traffic junctions:** 46 major traffic junctions with heavy traffic are in the vulnerable areas (64% of the total heavy traffic junctions19 in the city).<br><br>**Vulnerable people:** Around 14,700 people who are using UCTSL buses | | Vulnerable area: 90% of city area (57.88 sq. km) Vulnerable wards: 3, 4, 20, 24, 40, 43 | Rising air pollution poses severe health risks for young children, leading to respiratory issues, reduced lung development, and increased vulnerability to infections. Prolonged exposure can impair cognitive development and overall well-being. Vulnerable children are especially at risk, with heightened demand for healthcare services and long-term health interventions. |

# 8 Climate Vulnerability Assessment

Urban heat impact analysis is conducted for the month of May since it is the hottest month of the year. Spatial analysis of day and night temperatures have been used for the Land Surface Temperature (LST) trend assessment. *(Source: CRCAP Udaipur 2024)*

| Urban Services Vulnerability | | | | | |
|---|---|---|---|---|---|
| **Services** | **Vulnerability** | **Vulnerable Population** | **Vulnerable Children (0-6 Years)** | **Vulnerable wards/Area** | **Fragility Statement** |
| Water Supply | Vulnerability due to Urban Heat | Around 6% population are living in these vulnerable wards and can be impacted due to extreme heat event | 3004 young children | Ward No: 9, 40, 44 and 45 | Rising ambient temperatures, particularly during extreme heat events, increase water demand, which poses significant risks to young children. Limited water availability in summer months leads to over-extraction of groundwater, further straining water resources. Children in areas facing both extreme heat and drinking water shortages are especially vulnerable, facing heightened risks of dehydration, poor hygiene, and waterborne illnesses. |
| | Vulnerability due to Urban Flood | 22,182 Population (4% of the total population), Vendors- 293 (10.5% of the total vendors in the city) | 2358 young children | Ward No: 3, 48 and 69 | Heavy rainfall and urban flooding can severely disrupt urban water supply systems, particularly in areas with compromised infrastructure, posing serious risks to young children. Contaminated water supplies increase the likelihood of waterborne diseases, while service interruptions limit access to clean drinking water, exacerbating health risks such as dehydration and diarrhea. Young children, with their heightened vulnerability, are particularly at risk during these disruptions. |
| Wastewater Management | Vulnerability due to Urban Heat | 59,879 (11% of the total population) | 6365 young children | Ward No: 17, 35, 40, 41, 65, 68 and 69 | Extreme heat accelerates the decomposition of inadequately treated sewage and faucal sludge, leading to unsafe disposal in natural drains, particularly in newly developed urban areas. This poses severe health risks to |
| | | 2,635 slum population (17% of the slum population) | 280 young children | | |

| | | | | | |
|---|---|---|---|---|---|
| | | 443 vendors (16% of the vendor in the city) | - | | young children, especially those in low-lying and underserved communities. Increased exposure to harmful pathogens can result in heightened cases of gastrointestinal and respiratory illnesses, with young children being particularly vulnerable due to their developing immune systems. |
| | Vulnerability due to Urban Flood | 52,128 (9% of the total population) | 5541 young children | Ward No: 1, 10, 21, 27, 35, 40, 48 and 70 | Urban flooding overwhelms compromised sewage systems, leading to the overflow of untreated waste, which contaminates surface and groundwater. This poses serious health risks to young children, increasing their exposure to waterborne diseases such as diarrhea and infections. Floodwaters can also disrupt sewage treatment operations, further degrading water quality and heightening the vulnerability of young children, particularly those in low-lying areas. |
| | | 1,592 slum population (10% of the slum population) | 169 young children | | |
| | | 275 vendors (10.88% of the vendor in the city)and 70) | - | | |
| Solid Waste management | Vulnerability due to Urban Heat | 115,095 (21% of total population) | 12,235 young children | Ward No: 1, 15, 20, 21, 22, 24, 27, 35, 37, 40, 41, 43, 44, 45 and 70) | Extreme heat accelerates waste decomposition, raising the risk of landfill fires and harmful pollutants in nearby areas. This poses serious health risks to young children, particularly those exposed to toxic fumes from open dumpsites. |
| | | 3,710 slum population (23% of total slum population) | 394 young children | | |
| | | 765 vendors (27% of vendors) | - | | |
| | Vulnerability due to Urban Flood | 115,095 (21% of total population) | 12,235 young children | Ward No: 35, 39, 40, 46, 48, 64 and 69 | Urban flooding exacerbates drainage blockages, causing increased leachate flow from open dumpsites, contaminating land, surface water, and groundwater. This poses severe health risks to young children, exposing them to waterborne diseases and harmful toxins from polluted environments. |
| | | 3,710 slum population (23% of total slum population) | 394 young children | | |
| | | 765 vendors (27% of vendors) | - | | |
| Transportation | Vulnerability due to Urban Heat | Around 14,700 people who are using UCTSL buse | - | 47 Public Transport stops (78% of total stops) | Extreme heat poses serious health risks to young children using public transport, as they are especially vulnerable to |

| | | | | | |
|---|---|---|---|---|---|
| | | | | 46 major traffic junctions with heavy traffic are in the vulnerable areas (64% of the total heavy traffic junctions19 in the city) | heat stress while waiting at stations or traveling as pedestrians and cyclists. The discomfort caused by rising temperatures increases the demand for climate-controlled public transport, potentially leading to greater reliance on personal vehicles, further limiting safe, accessible travel options for children. |
| | Vulnerability due to Urban Flood | Around 14,700 people who are using UCTSL buses | - | Ward No: 63, 64, 67, 69<br>20 Public Transport stops (33% of total stops).<br>40 major traffic junctions with heavy traffic are in prompt to urban flood areas (56% of the total heavy traffic junctions20 in the city). | Urban flooding from extreme rainfall significantly impacts public transport, worsening road infrastructure and creating waterlogged conditions that hinder connectivity and mobility. Young children, who rely on public transport for travel to school and healthcare, are particularly vulnerable during these disruptions, facing increased travel times, safety risks, and limited access to essential services. |
| Emergency Services | Vulnerability due to Urban Flood | • Hospitals at risk: 59% of all hospitals (27 hospitals).<br>• Fire stations at risk: 3 out of 5 fire stations (Ashok Nagar, Chetak Circle, Madri) | | Ward No: 2, 40, 46,48, 50, 52, 56, 59, 61, 62, 66 & 67 | During heavy rainfall and flooding in Udaipur, access to emergency services, including hospitals and fire services, is severely restricted, putting young children at heightened risk. Vulnerable urban poor communities, where children are already at risk of health emergencies, face even greater challenges in receiving timely medical care and emergency response due to inundated roads and limited mobility. This exacerbates health risks for young children during critical situations. |
| AW Centers (ECCD Specific) | Vulnerability due to Urban Heat | AWC at risk: 74% (111 AWCs) of all 150 AWCs | 4881 young children (Total Enrollments) | 91% of city Area | Extreme heat severely affects AWCs without electricity and cooling, increasing risks of heat stress for young children. The lack of green pathways or shaded areas worsens exposure, limiting safe outdoor activities. Vulnerable children, especially in urban poor |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | communities, face heightened health risks and service disruption. |
| | Vulnerability due to Urban Flood | AWC at risk: 24.66% (37 AWCs) of all 150 AWCs | 1663 Young children (Total Enrollments) | 13% of city area Ward No: 2-5, 7, 8, 12, 13, 16-18, 32-41, 45-53, 55-57, 59-70 | Heavy rainfall and flooding in Udaipur disrupt access to AWCs, limiting essential services like nutrition, healthcare, and early childhood education for young children. Vulnerable urban poor communities, particularly those with young children, face significant challenges in reaching these centers during floods, increasing the risk of malnutrition, health complications, and developmental delays due to a lack of consistent services. |
| Parks and play grounds | Vulnerability due to Urban Heat | Total Parks in the city: 247 (200 UMC; 44 UDA and 03 PWD owned) | Extreme heat in Udaipur limits young children's access to parks and playgrounds, reducing opportunities for outdoor play and physical activity. Prolonged exposure to high temperatures increases the risk of heat-related illnesses, discouraging families from using these spaces. This particularly affects vulnerable children from urban poor areas, where parks may lack shaded areas and cooling infrastructure, further restricting safe outdoor activities and impacting their physical and social development. | | |
| | Vulnerability due to Urban Flood | | Urban flooding and heavy rainfall in Udaipur not only limit young children's access to parks and playgrounds due to waterlogging and damage but also create breeding grounds for insects, increasing the risk of diseases like malaria and dengue. These conditions make outdoor spaces unsafe for play, especially for children in vulnerable urban poor areas with inadequate drainage and pest control. Prolonged closures and health risks from insect infestations further restrict children's physical activity and social interaction, negatively impacting their overall development. | | |

*Source: CRCAP, Udaipur 2024; Udaipur Dist. Environment Plan; Gorakhpur Environmental Action Group (GEAG)*

### Cyclones

In 2021 and 2023, Udaipur faced significant challenges for young children as Cyclones “Tauktae and Biporjoy” brought heavy rainfall and thunderstorms for total three days. During the Tauktae, all lakes overflowed, causing water to flow into the Ayad River, which severely impacted the nearby colonies situated downstream. These communities were unprepared for flooding, leading to extensive water inundation and further compounding the challenges faced by vulnerable children, particularly in urban poor areas.

The flooding disrupted access to essential services such as healthcare, nutrition, and safe shelter. Many families were forced to evacuate their homes, exposing young children to unsafe conditions and heightening their risk of injury and waterborne diseases.

Additionally, the psychological impact of the storm, including anxiety and fear from experiencing severe weather events, can lead to long-term emotional distress in children. The flooding rendered many play

areas unsafe, limiting opportunities for outdoor play and social interaction, which are crucial for their physical and emotional development. Overall, the impacts of Cyclones “Tauktae and Biporjoy” highlighted the heightened vulnerabilities faced by young children during extreme weather events, emphasizing the need for improved resilience and support systems.

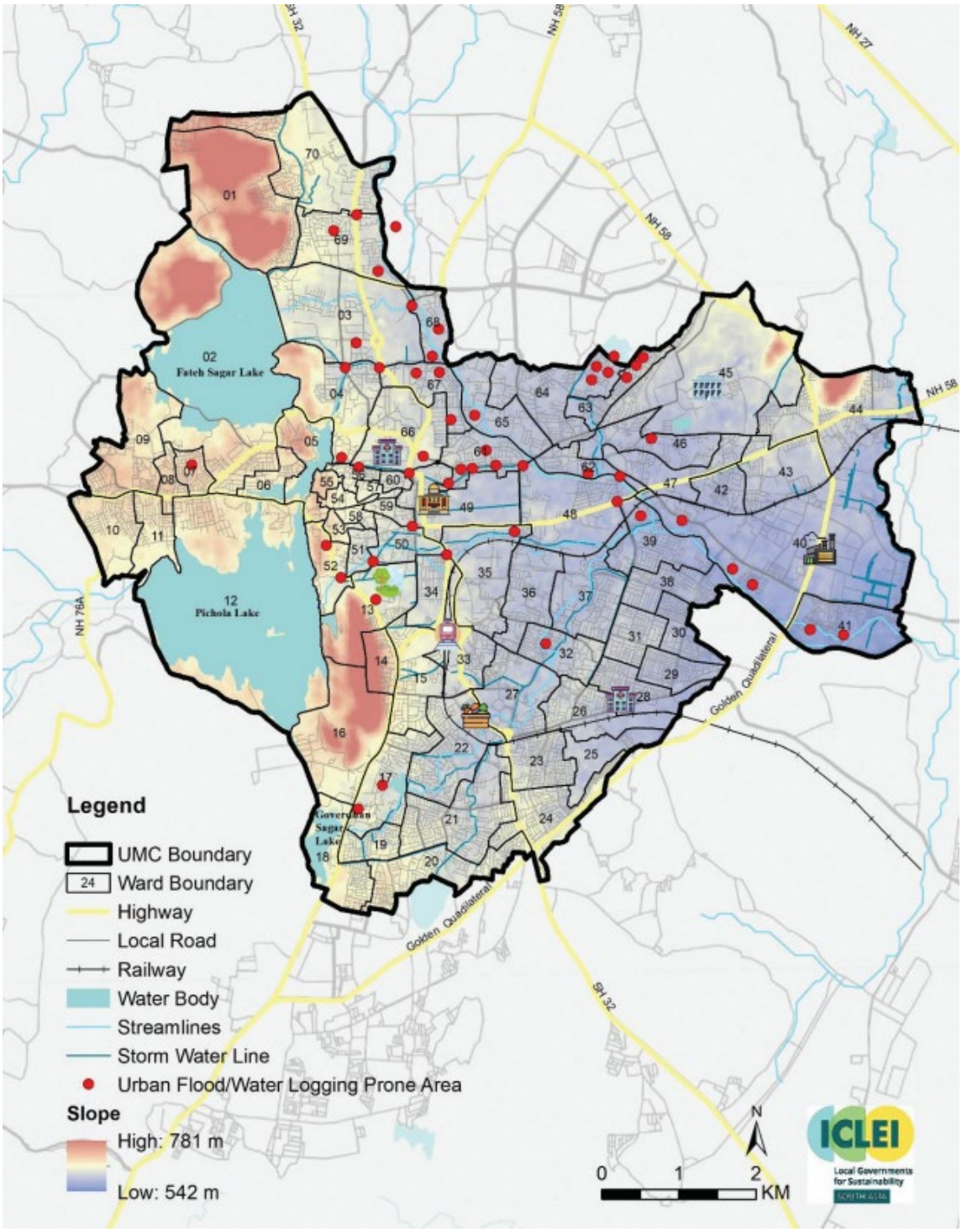

*Figure 9 Link: https://www.abplive.com/states/rajasthan/cyclone-biparjoy-effect-in-udaipur-district-collector-established-helpline-number-ann-2432241*

# 9 Conclusion

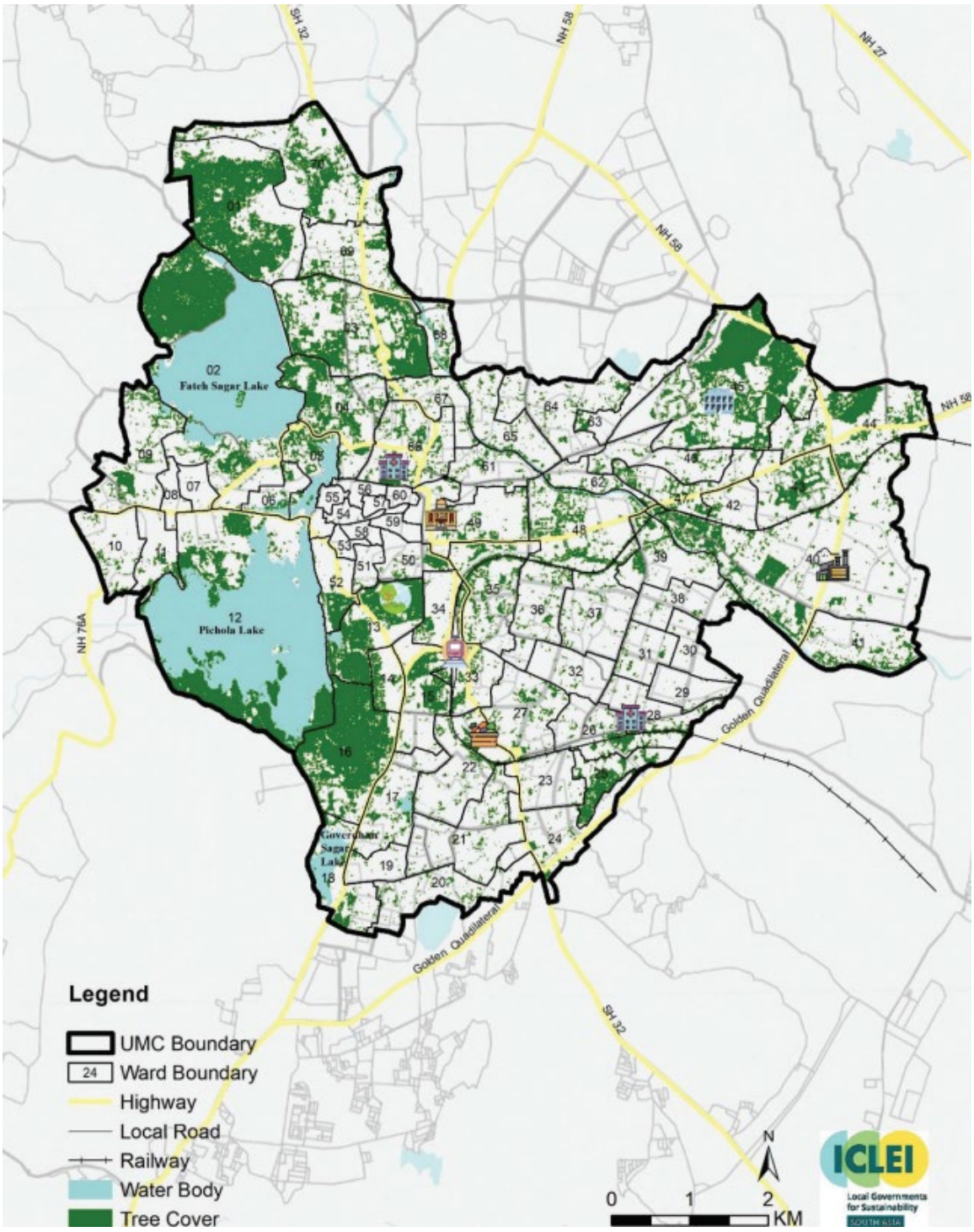
[to be updated]

# 10 Annexures

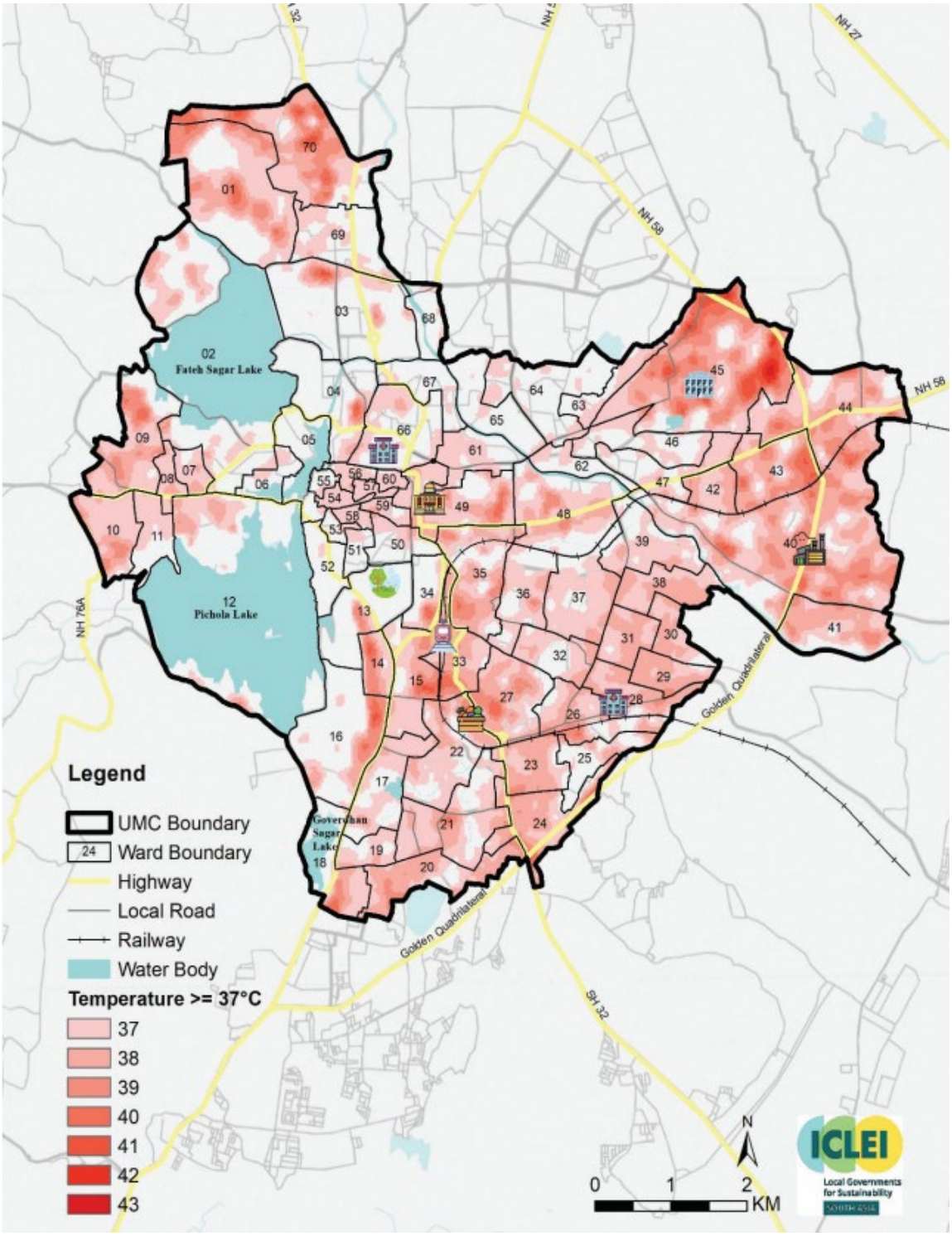
**Annexure: 01- Urban Flood Area Assessment**



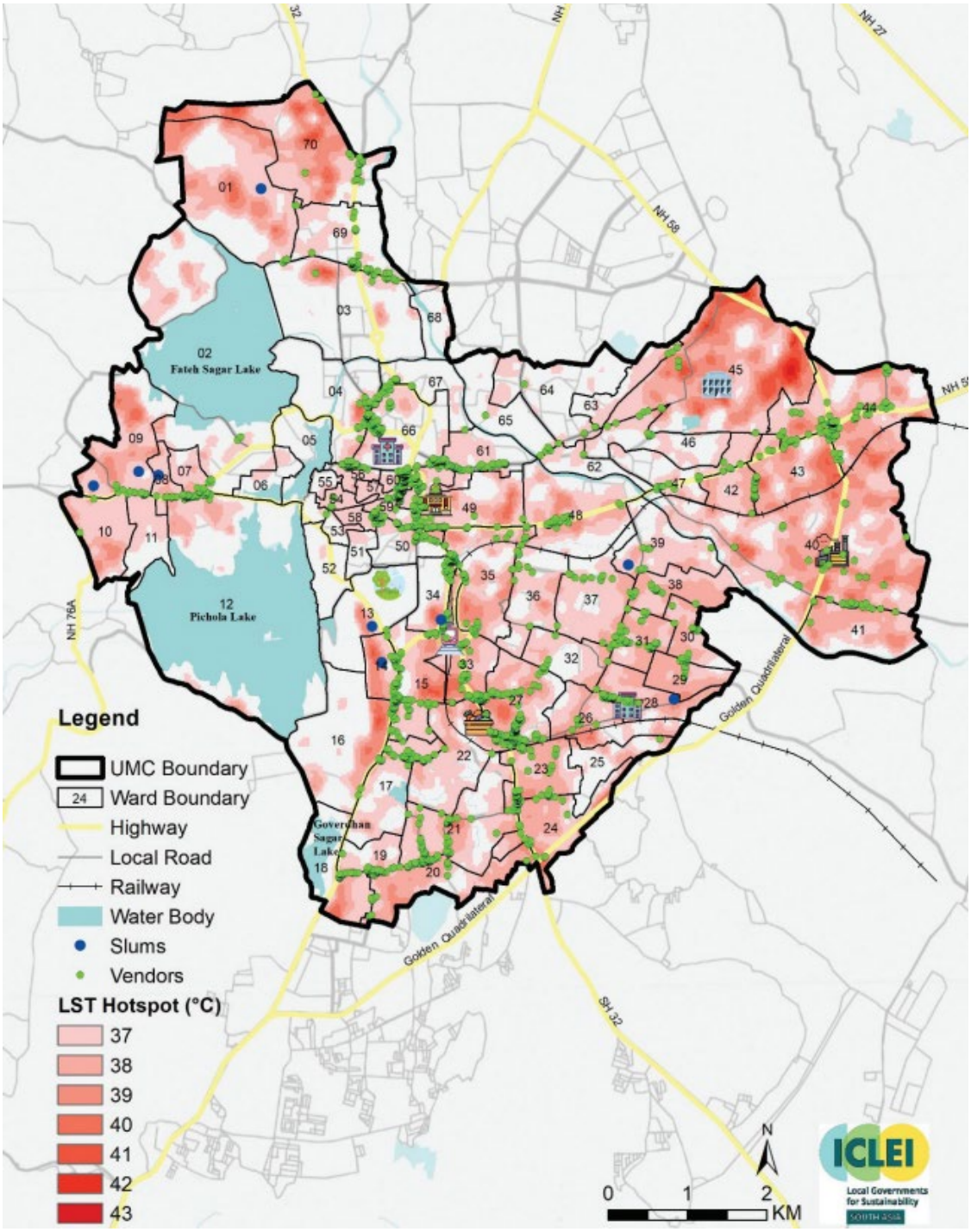
**Annexure: 02- Udaipur Tree Cover 2023**



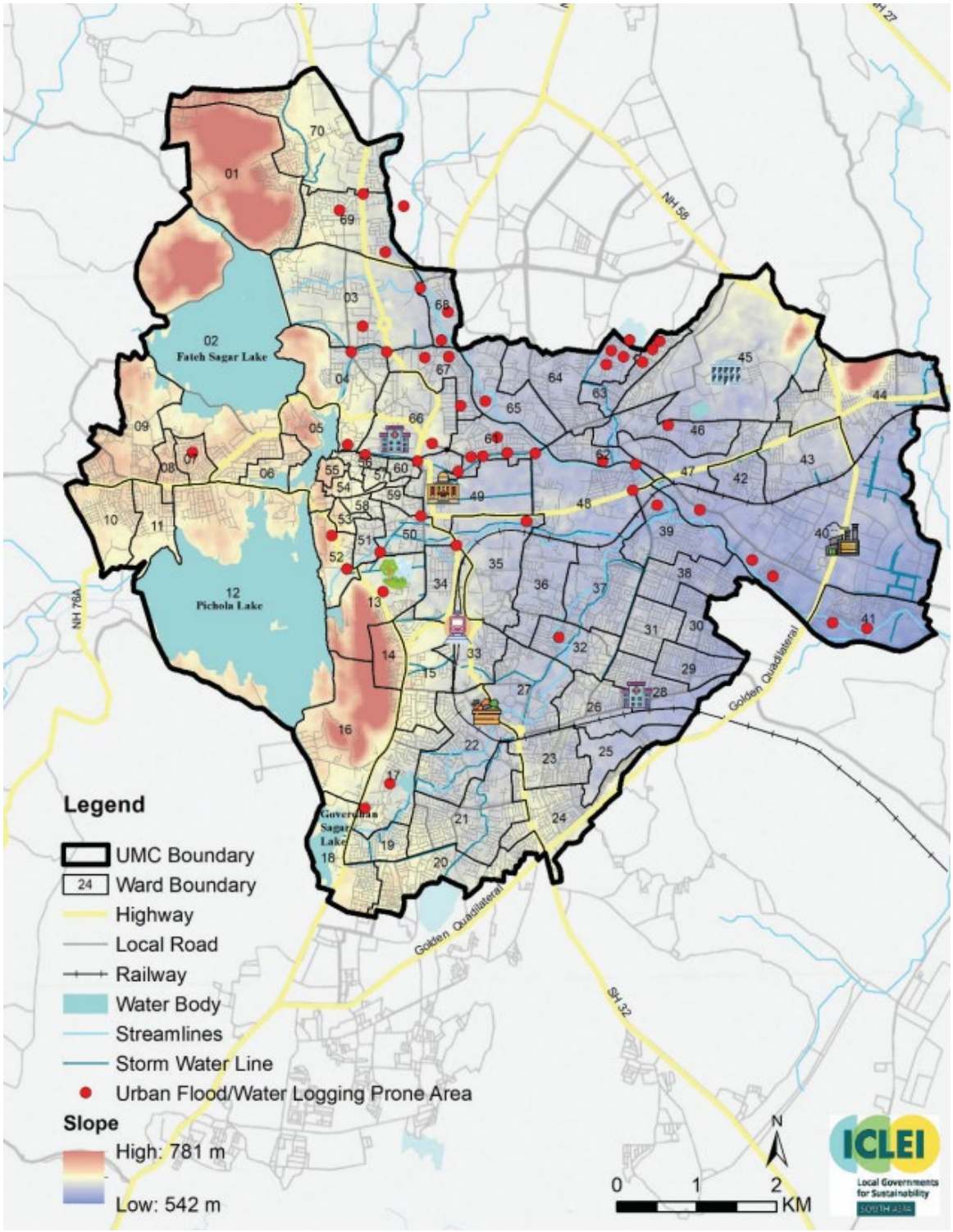
**Annexure: 03- Land surface temperature hotspot areas**



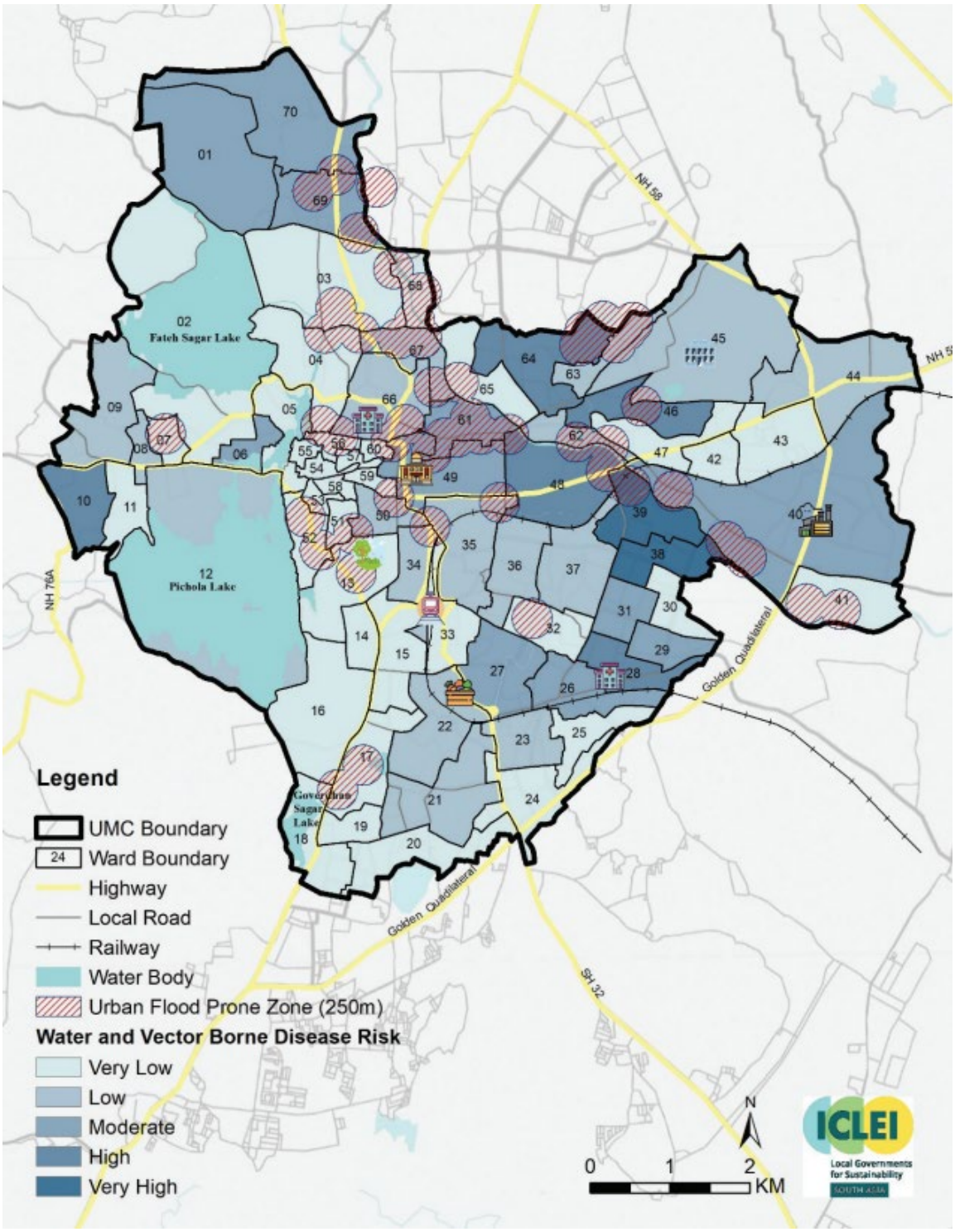
**Annexure: 04- Location of slums and vendors vulnerable to urban heat**



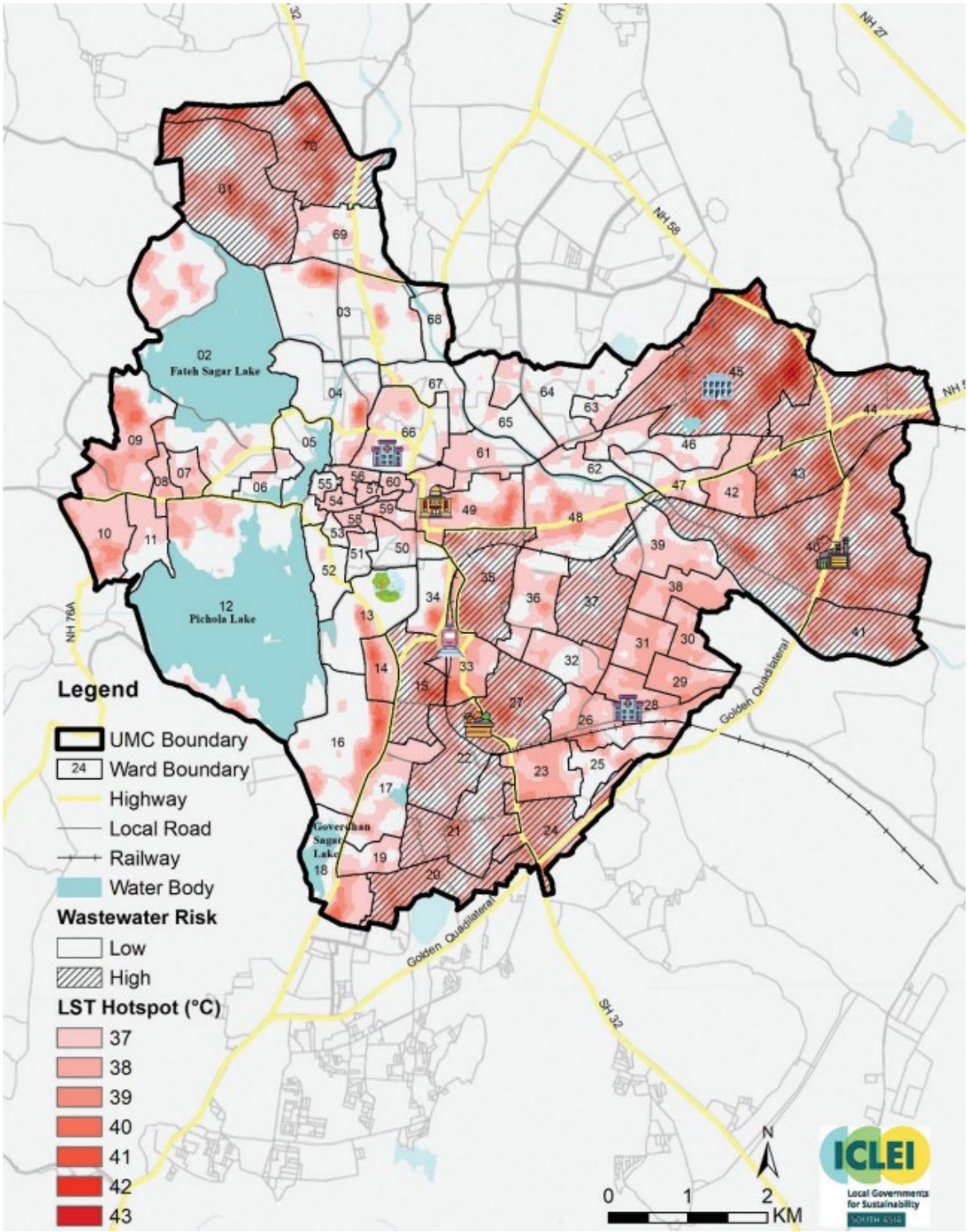
**Annexure: 05- Flood prone area assessment**



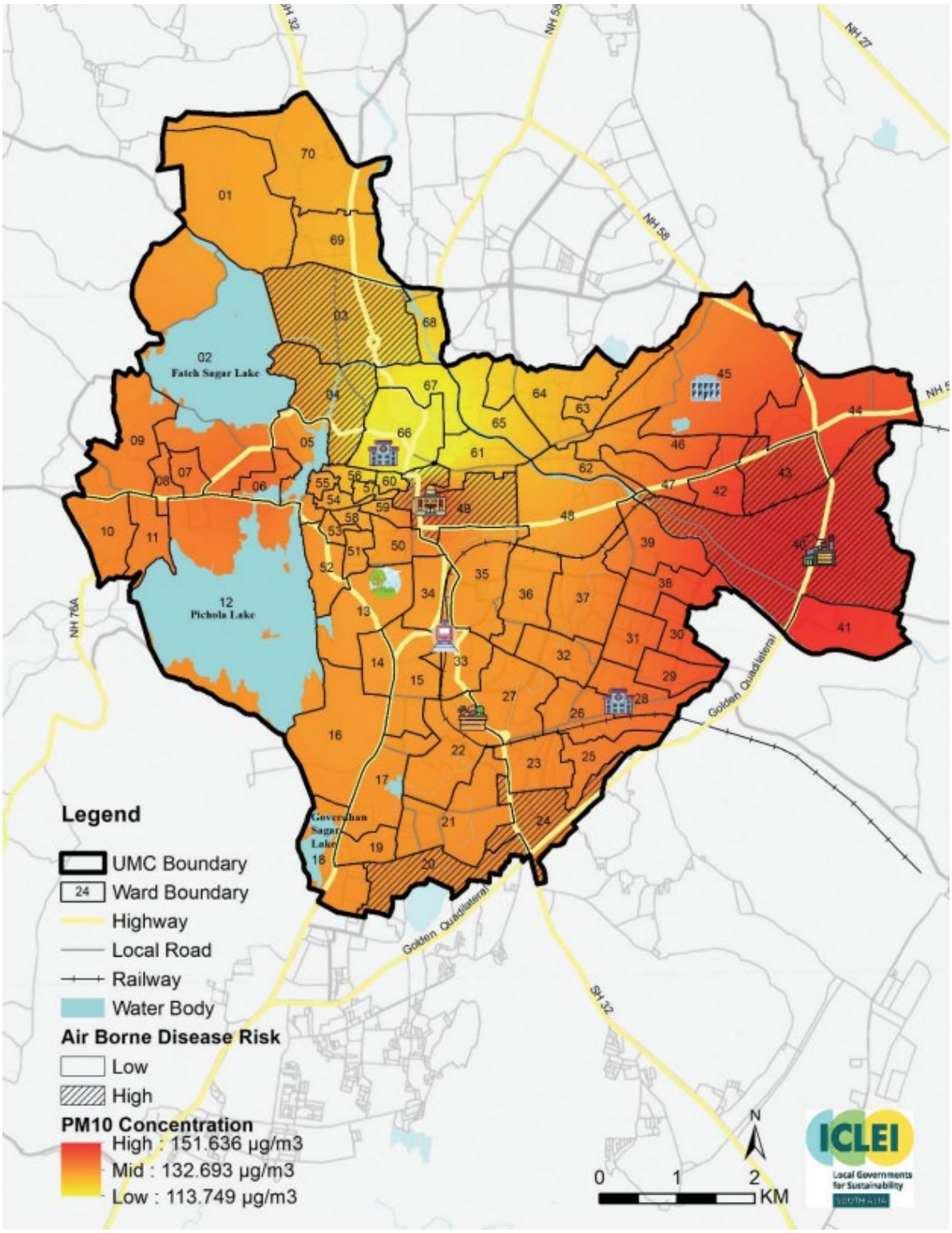
**Annexure: 06- Flood prone area assessment**



**Annexure: 07- Wards exposed to urban heat and wastewater management related issues**



**Annexure: 08- Areas with high air pollution and air borne disease risk**



**Annexure: 09- Ward wise Population**

| Ward No | Total Population | Young Children (0-6 age group) Population |
|---|---|---|
| 1. | 7976 | 848 |
| 2. | 7667 | 815 |
| 3. | 6434 | 684 |
| 4. | 8232 | 875 |
| 5. | 7110 | 756 |
| 6. | 8110 | 862 |
| 7. | 7311 | 777 |
| 8. | 7736 | 822 |
| 9. | 8434 | 897 |
| 10. | 7368 | 783 |
| 11. | 6565 | 698 |
| 12. | 8394 | 892 |
| 13. | 8436 | 897 |
| 14. | 8263 | 878 |
| 15. | 8313 | 884 |
| 16. | 8159 | 867 |
| 17. | 7743 | 823 |
| 18. | 7465 | 794 |
| 19. | 7823 | 832 |
| 20. | 8443 | 897 |
| 21. | 8239 | 876 |
| 22. | 8291 | 881 |
| 23. | 8565 | 910 |
| 24. | 8439 | 897 |
| 25. | 9732 | 1035 |
| 26. | 8233 | 875 |

| | | |
|---|---|---|
| 27. | 6773 | 720 |
| 28. | 8426 | 896 |
| 29. | 8508 | 904 |
| 30. | 7088 | 753 |
| 31. | 8022 | 853 |
| 32. | 8040 | 855 |
| 33. | 8468 | 900 |
| 34. | 7797 | 829 |
| 35. | 6426 | 683 |
| 36. | 7762 | 825 |
| 37. | 7316 | 778 |
| 38. | 7352 | 782 |
| 39. | 8386 | 891 |
| 40. | 7468 | 794 |
| 41. | 8015 | 852 |
| 42. | 7864 | 836 |
| 43. | 5868 | 624 |
| 44. | 8145 | 866 |
| 45. | 7664 | 815 |
| 46. | 8916 | 948 |
| 47. | 8071 | 858 |
| 48. | 7910 | 841 |
| 49. | 7663 | 815 |
| 50. | 8482 | 902 |
| 51. | 8678 | 922 |
| 52. | 7864 | 836 |
| 53. | 7361 | 782 |
| 54. | 7958 | 846 |

| | | |
|---|---|---|
| 55. | 8887 | 945 |
| 56. | 8227 | 875 |
| 57. | 8027 | 853 |
| 58. | 8393 | 892 |
| 59. | 8371 | 890 |
| 60. | 7451 | 792 |
| 61. | 8399 | 893 |
| 62. | 7585 | 806 |
| 63. | 7301 | 776 |
| 64. | 8246 | 877 |
| 65. | 6770 | 720 |
| 66. | 7734 | 822 |
| 67. | 10327 | 1098 |
| 68. | 7868 | 836 |
| 69. | 7838 | 833 |
| 70. | 7719 | 821 |

*(Source: UMC and ICDS)*

**Annexure: 10- AWC wise enrolments**

| AWC Name | Enrolments | Building status | | AWC Name | Enrolments | Building status |
|---|---|---|---|---|---|---|
| Meenapada | 87 | School Room | | Ramdwara Chowk | 81 | Rented |
| Nehru Bazar | 117 | School Room | | Dholi Baori | 121 | Rented |
| Gachhiwada | 91 | Rented | | Kheradiwara | 103 | Rented |
| Kunjarwadi | 52 | Rented | | Oda ka Pada | 135 | Rented |
| Kunjarwada | 109 | Rented | | Kanji hata 1 | 112 | Rented |
| Jogiwara | 79 | School Room | | Kanji hata 2 | 130 | Rented |
| Patho ki magri | 123 | Rented | | Naiyo ki talai | 105 | Rented |
| Kumharo ka Bhatta | 111 | Rented | | Moti Chohatta | 102 | Rented |
| Lohar basti | 83 | Rented | | Salvi Colony | 119 | Rented |
| Shabri colony | 90 | Rented | | Khadag ji Mini | 115 | Rented |
| Ravto ki badi | 109 | Rented | | Lotan Magri | 111 | Rented |
| Banjara Govaria | 112 | Rented | | Khanjipeer | 81 | Rented |
| Bekni Ganeshnagar | 157 | Rented | | Indra nagar | 121 | Rented |
| Pahara 1 | 100 | Rented | | Silawatwari 1 | 103 | Rented |
| Pahara 2 | 97 | Rented | | Silawatwari 2 | 135 | Rented |
| Roop Sagar | 112 | Rented | | Mahawatwari 1 | 112 | School Room |
| Lali Saray | 105 | Rented | | Mahawat wari 2 | 130 | Rented |
| Sunderwas 1 | 102 | Rented | | Bichhughati | 121 | Rented |
| Sunderwas 2 | 119 | Rented | | Jaatwari | 87 | Rented |
| Dhebar Colony 1 | 111 | Rented | | Imli ghat | 117 | Rented |
| Dhebar Colony 2 | 81 | Rented | | Naga Nagri | 52 | Rented |
| Khempura 1 | 121 | School Room | | Noor Nagri | 109 | Rented |
| Khempura 2 | 103 | Rented | | Bhindar haweli | 79 | Rented |
| Gameti Mohalla | 135 | Rented | | Panduwadi | 123 | School Room |
| South Sunderwas | 112 | Rented | | Laalghat | 111 | Rented |
| Math Madri | 130 | Rented | | Bhatiyani chohatta | 83 | Rented |
| Shaktinagar | 105 | Rented | | Yadav Colony | 90 | Rented |
| Pratapnagar | 102 | Rented | | Ambavgarh | 112 | Rented |
| Kukkutshala | 119 | School Room | | Sajjan nagar | 105 | Rented |
| Sector 4 | 115 | Rented | | Premnagar | 102 | Rented |
| Sector 3 | 111 | School Room | | Amal ka kanta | 119 | Rented |
| Nokha | 81 | Rented | | Data bheru | 115 | Rented |
| Paneri Madri 1 | 121 | Rented | | Mograwadi | 111 | Rented |
| Paneri Madri 2 | 103 | Rented | | Shivaji nagar | 81 | Rented |
| Prabhatnagar | 135 | Rented | | Kishanpol mini | 121 | School Room |
| Rajiv Colony | 112 | Rented | | Kishanpol 1 | 103 | Rented |
| Chamanpura | 130 | School Room | | Kishan pol 2 | 135 | Rented |
| Naiwara | 105 | Rented | | Patel circle | 112 | Rented |
| Khatikwara | 102 | Rented | | Machla magra 1 | 105 | School Room |
| Mehta ji ki Khidki | 119 | Rented | | Swaraj nagar 1 | 102 | Rented |
| Bhoiwara 1 | 115 | Rented | | Swaraj nagar 2 | 119 | Rented |
| Bhoiwara 2 | 111 | Rented | | Machla magra 2 | 115 | Rented |
| Kamla nagar | 103 | Rented | | ML Tejawat | 123 | Rented |
| Kailash colony | 135 | Rented | | Nimachmata A | 96 | Rented |

| | | | | | | |
|---|---|---|---|---|---|---|
| Nai Basti | 112 | Rented | | Neemachmata B | 83 | Rented |
| Indra colony | 105 | School Room | | Neemach kheda | 93 | ICDS Building |
| Ambedkar nagar | 102 | Rented | | Manoharpura | 109 | School Room |
| Sec 14 | 119 | Rented | | Hanuman colony | 116 | Rented |
| Sec 11 | 115 | Rented | | Pulaan 1 | 109 | School Room |
| Kheda | 121 | Rented | | Pulaan 2 | 101 | Rented |
| Roshanji ki badi | 87 | Rented | | Pulaan mini | 97 | Rented |
| Barkat colony | 125 | Govt Building | | Sh. bhagatsingh 1 | 121 | Rented |
| Govardhan vilas1 | 103 | School Room | | Sh. Bhagatsingh 2 | 111 | School Room |
| Sec 9 | 135 | Rented | | Krishnapura | 102 | Rented |
| Varma colony | 112 | Rented | | Alipura | 119 | Rented |
| Vijaysingh pathik | 111 | Rented | | Bhikharinath math | 117 | School Room |
| VS kacchi basti | 102 | Rented | | Ram Manohar | 111 | Rented |
| Sec 9-1 | 119 | Rented | | Sajjan nagar 1 | 104 | Rented |
| Roshan nagar | 115 | Rented | | Mastan colony | 98 | Rented |
| Awrimata | 111 | Rented | | Bhilurana | 109 | School Room |
| Gariyawas 1 | 98 | Rented | | Rata khet | 112 | Rented |
| Gariyawas 2 | 121 | Rented | | Amar nagar | 157 | Rented |
| Tekri | 103 | School Room | | Champa colony | 101 | Rented |
| Police line | 135 | Govt Quarter | | Eklavya colony | 97 | Rented |
| Homepura | 83 | Rented | | Bhil basti | 112 | Rented |
| Regar colony | 90 | Rented | | Daitya magri | 105 | Rented |
| Surajpol 1 | 109 | Rented | | Dewali | 102 | Rented |
| Surajpol 2 | 112 | Rented | | Dewali 2 | 123 | Rented |
| Brahmpuri | 157 | Rented | | Farukh basti | 105 | Rented |
| Picholi | 100 | Rented | | Kalbelia basti | 102 | Rented |
| Ambaata harijan | 97 | Rented | | Mallah talai | 119 | Rented |
| Od basti | 112 | Rented | | Gandhinagar | 115 | Rented |
| | | | | | | |