# Study of Urban Renewal in Towns and Cities of Meghalaya and Measures for transforming them as Engines of Sustainable Growth and Development

North-Eastern Development Finance Corporation Limited (NEDFi)

November 15, 2024

## Final report

### Volume I - Main Report

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# Executive Summary

TITLE OF THE STUDY

**Study of Urban Renewal in Towns and City of Meghalaya and Measures for transforming them as Engines of Sustainable Growth and Development"**

The Final Report is divided into two volumes. Volume I is the main report, which includes analysis, strategies, recommendations, a project pipeline, and prioritization. Volume II serves as the supporting document and contains annexures that list consultation meetings, data referenced for the study, snapshots of survey forms, detailed case studies, detailed calculations, the project prioritization index, and additional findings.

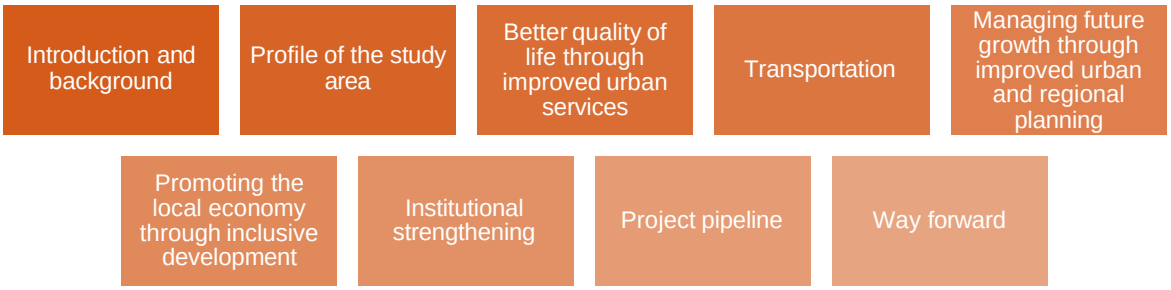
This 'Final Report' is the final deliverable under the project "**Study of Urban Renewal in Towns and City of Meghalaya and Measures for transforming them as Engines of Sustainable Growth and Development**", submitted in fulfilment of the agreement signed between the client NEDFi and the PwCPL on 8 December 2021. The study aims to provide a framework for urban renewal in towns and cities of Meghalaya and suggest measures for transforming these as engines of sustainable growth and development. It focuses on building an understanding of the level and extent of urban issues in the state including urban density, decays in urban housing, infrastructure, spaces, street vendors/ hawkers, pollution, traffic congestion and propose strategies and measures to ease these issues.


The broader project which this report is a component of, utilized a plethora of primary and secondary sources and employed quantitative and qualitative analysis to derive as-it-is insights on rapid urbanisation and spatial growth in the state, and the consequent decays in urban housing systems, infrastructure, green spaces, water supply systems, solid waste management systems, poor drainage and sewerage systems, traffic and transport systems and their impacts on sustainable urban growth. The study also investigates the urban density, residential density, and commercial density in urban local bodies to prescribe correctives to ease high-density areas. The importance and development of urban agriculture as one of the sustainable components of town planning is further emphasized on, along with other broad issues which affect the healthy growth of towns and cities (such as urban finance and institutional capacity).

The purpose of this report is to provide strategies, recommendations and measures for sustainable urban growth and development of Meghalaya and develop a project pipeline to achieve the Sustainable Development Goal 11 in the state's urban local bodies including census towns. Projects have been conceptualized and prioritised based on the need of urban infrastructure and services, as inferred from site assessment, stakeholder consultations, perception surveys, traffic surveys and focus group discussions. The report ultimately suggests a demand-driven urban investment approach.

The report's first chapter introduces the study's objectives, data collection methods, and tools. The second chapter provides an overview of Meghalaya and the study areas, including key issues and findings we derived from the mid-term report. It also explains how recommendations were formulated

to suit the Meghalaya context as suggested by Dr. P.S. Nianglang and Dr. Abhijit Sharma, the subject matter experts appointed by the NEDFi. Chapters three to seven cover different thematic areas, presenting the overall scenario, key findings, primary survey analysis, and recommendations for each sector. The seventh chapter focuses on cross-cutting themes affecting service delivery across sectors, such as institutional structures and urban finances. It includes measures for capacity building, revenue augmentation, property tax reform, and financial support. The eighth chapter summarizes the project pipeline, while the last chapter includes a project prioritization that covers sector-wise priority projects and low-hanging fruit projects. The final report includes an Annexure as Volume II with detailed case studies, detailed calculations, and additional findings. Additionally, Annexure V highlights how our proposed projects align with SDG 11 specifically, while Annexure W outlines how they align with all the SDGs.



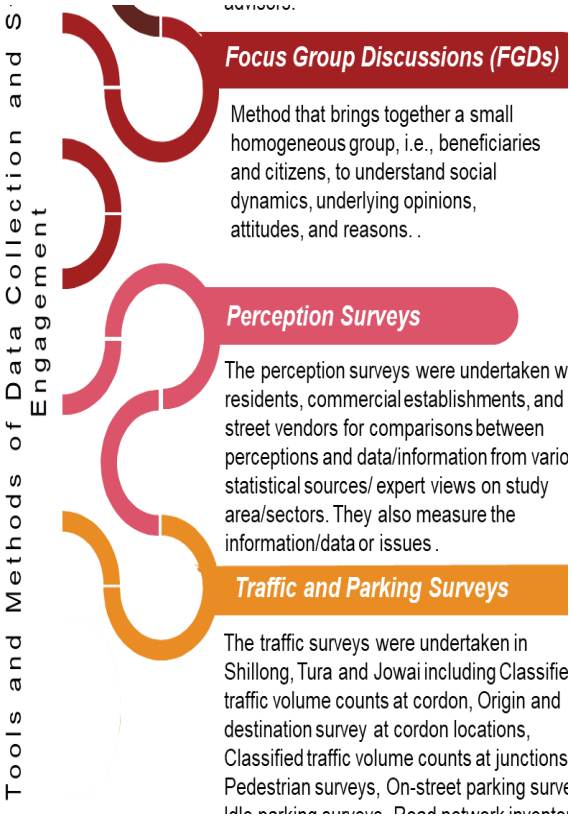

For the study, eight urban centres were selected based on diversity across districts, size, administrative status, and population factors. These towns are located in seven out of the twelve districts in the state, representing a significant proportion of Meghalaya's urban population and providing a representative sample for studying urban decay and suggesting holistic recommendations.

| ULB | District | Administrative Status | Population as per 2011 Census | 2022 estimated population | Tier in 2022 | 2030 projected population | Tier by 2030 |
|---|---|---|---|---|---|---|---|
| Shillong | East Khasi Hills | Municipal Board | 143,229 | 155,563 | IC | 165,195 | IC |
| Mawlai | East Khasi Hills | Census Town | 55,012 | 81,923 | II | 109,442 | IC |
| Tura | West Garo Hills | Municipal Board | 74,858 | 92,987 | II | 104,886 | 1C |
| Nongstoin | West Khasi Hills | Town Committee | 28,742 | 36,557 | III | 43,534 | III |
| Jowai | West Jaintia Hills | Municipal Board | 28,430 | 33,121 | III | 37,357 | III |
| Resubelpara | East Garo Hills | Municipal Board | 19,439 | 24,402 | III | 29,239 | III |
| Baghmara | South Garo Hills | Municipal Board | 13,131 | 21,750 | III | 29,148 | III |
| Nongpoh | Ri Bhoi | Town Committee | 17,055 | 22,661 | III | 27,853 | III |

The team carried out sectoral analysis relating to water, wastewater, storm water, solid waste management, housing, transportation, street vendors, urban agriculture, and environment. The combination of Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), Perception Surveys and Traffic and Parking Surveys were undertaken for data collection and analysis used to arrive at accurate data points for assessment.

Upon reviewing the existing master plans and understanding the urban and spatial growth in the project towns, the team noted that not all the project towns have undergone a master planning exercise and the available master plans in selected cases are outdated. Jowai and Shillong are the only urban centres in the state which had their formal master plans, however, both these documents are over three decades old. From the discussions with DUA and other departments, the team understood that the latest master plan for Shillong city is currently under revision. Tura Vision Statement was revised in 2011 with a focus to accommodate the increasing population and urban growth. Baghmara perspective plan was prepared for a duration of thirty years (2001 – 2031) with an

emphasis on compact residential development foreseeing the population growth trends. It is observed that enforcement of the existing norms is weak due to the presence of complex institutional setup and overlapping roles and hierarchy of such institutions. Stakeholder engagements are rarely undertaken prior to master plan formulation which is now hindering an effective local plan implementation and ownership among the stakeholders. We also attempted to understand the spatial growth patterns in each town through site visits and further complementing it by studying the satellite images of the towns. This was also validated during key interviews and an immediate need for geo-spatial mapping for all towns emerged which can help in accurate demand assessment and forecasting. Shillong, Jowai and Tura have evolved around the CBDs and district headquarters, and they have continued to grow with medium density and highly dense city cores. In addition to this, the terrain, topography, geography and building by-laws limit the scope for vertical expansion which may alternatively bring forth compact and high-density development. Based on our analysis, Shillong, Tura, Jowai, and Mawlai are the towns with the potential to evolve as multicentric towns/cities, while Nongpoh, Nongstoin, Resubelpara, and Baghmara are monocentric towns.




The review of basic infrastructure revealed that access to these services is inadequate, gaps exist across the value chain and institutional complexities and lack of coordination between the concerned departments and the policy makers persists. The housing sector has an acute shortage of quality housing stock and lack of funding has resulted in dilapidated conditions making these spaces and activity systems non-serviceable. The transport sector has been studied based on the secondary studies and the traffic surveys. The transport challenges in the state include narrow roads, congestion, increasing and unplanned population and sprawl, inadequacy of robust public transport systems, walkways, footpaths, and absence of integrated land use planning and land bank. According to our perception survey, citizens did not rate the provision of these basic services very highly.

**Key urban sector challenges in Meghalaya**

- **Basic services:** low water supply coverage, high NRW rate, lack of waste management facilities, high dependence on septic tank systems, absence of wastewater treatment facilities, no proper drainage system
- **Housing & Density:** Land conversion and development mechanism, limited private developers, congested core city
- **Transportation & Mobility:** Congestion due to high traffic, constraints in road augmentation (diversion of traffic), restricted public and non-motorized transport facilities
- **Land-use Planning:** Absence or no updated master plans, limited data availability, expansion of land for development purposes, inorganic growth and urban sprawl, absence of hilly area specific by-laws
- **Climate and Environmental Sustainability:** Integration of resources-management, low per capita green spaces in urban areas, river pollution due to absence of sewerage system
- **Local economy:** Unorganized street vending, no integrated development, limited agro-based industries
- **Governance:** Proper resource mobilization capacity, limited linkages of people's institutions with governance, limited manpower

For the street vending sector, there are centrally sponsored and state sponsored schemes and missions with an existing governance mechanism. The true economic potential of street vending is yet to be realized. We have reviewed some unique approaches and best practices locally and globally available in these sectors to understand replicability and implementation in the context of Meghalaya.

From the surveys, the data and information relating to AMRUT indicated that Meghalaya has 15 sqm of per capita open spaces. Although, the benchmarks are relatively higher than the national


standards, population growth leading to subsequent urban growth is gradually leading to reduction in the green cover. According to the master plans, the open spaces are not evenly distributed and easily accessible. This is evident in Shillong's dense settlements and slums. Within a 10-minute walk (400m radius) of such areas or communities, there are no public open spaces available.

The inability of relevant urban institutions to sufficiently build capacity and upskill their manpower results in poor revenue collection, sub-optimal service delivery and weak urban governance. Capacity building of local ULB officials and local elected representatives is therefore a critical first step to improve urban planning and urban services. This needs to be carried out in a phased, coherent manner with concerted efforts from all relevant stakeholders at the state and city levels. Revenue augmentation measures, with a special focus on property tax reform, are also discussed in the report.

A need for new approach to town planning and policy becomes critical for holistic development of Meghalaya. The involvement of residents in development is imperative towards building awareness, confidence, and participation. Stakeholders' involvement for inclusive planning focusing on the parameters prescribed in the URDPFI Guidelines, 2014 is inevitable since it promotes agglomeration economies and accelerates economic growth in towns and cities. The ushering of 'sustainable cities and communities' as enshrined in SDG 11 can be facilitated through the harmonization of multiple sectors and concerted efforts from all stakeholders i.e. bottom-up approach. The recommendations stress on the need for integrating community participation, enhancing institutional capacity, augmenting financial resources, optimizing land resources, re-engineering urban governance and programmatic interventions to ensure urban development in the state.

The report and its recommendations were developed through an extensive FGD, survey and consultation process, the objective of which was to also address the issues and development challenges unique to the region. In the process, the team conducted a consultation with the Khasi Hills Autonomous District Council (KHADC). The discussion with KHADC focused on topics such as land management in the Khasi Hills and Ri-Bhoi Districts, the roles and responsibilities of ADCs, and possible recommendations for improving the land management system in Meghalaya.

While we successfully concluded the consultation with KHADC, our attempts to engage with the stakeholders in the Garo and Jaintia Hills Districts faced challenges due to their unavailability. To bridge this gap, we developed and distributed a detailed questionnaire to JHADC and GHADC aimed at understanding the land management systems in their regions. However, only JHADC responded to our questionnaire, providing insights into their land management practices and development challenges.

Some of the suggested actions by the officials of KHADC and JHADC include the digitization of land record mapping, the creation of land banks, and the development of an efficient land revenue share model. Additionally, they highlighted their active participation and interest in the decentralization of solid waste management within their jurisdiction. The inputs received from this consultation have been considered to arrive at the conclusion. These recommendations further elaborated and screened through a project prioritization framework, based on local context, priorities, and immediate needs of the State.

The recommendations provided in this report fall at the crossroads of spatial planning, socio-economic invigoration, and environmental sustainability. Our approach to developing the recommendations is two-fold; first, we have a set of **quantitative recommendations** which involve quantitatively determined, sector-specific gaps in service delivery. To actualize these recommendations, we utilized both Census and ULB data to understand current service levels and compared them to MoUD level benchmarks to triangulate service gaps; this has been elaborated on in the previous sub-sections. Then, through our reading of Detailed Project Reports (DPRs) and other

secondary sources, we validated these findings and investigated why these gaps exist. Finally, once we identified the reasons behind these gaps, we used High Powered Expert Committee (HPEC) and Central Public Health & Environmental Engineering Organization (CPHEEO) guidelines to devise bespoke investment estimates for each specific sector. Second, we also have a set of **qualitative recommendations** such as need for urban and regional planning and institutional strengthening through capacity building and effective e-governance. These have been customized to suit the urban Meghalaya context based on our reading of the available ULB Master Plans and through the FGDs. These recommendations are not sector specific, but cross-cutting in nature and affect the performance of all the sectors contemporaneously since they involve enhancing the effectiveness of overall planning and governance. These recommendations are supplemented by an implementation strategy, and cohesively form a **cross-sectoral integrated project pipeline.**

The high-level recommendations discussed in the report are as follows:

**Developing Master Plans for all Urban Local Bodies:** To enable sustainable growth, development of these cities and prominent regional nodes into efficient district headquarters, there is a need to carry out a visioning and detailed master planning exercise for the horizon of 20-25 years. Based on the open systems approach, master plan would have to take into consideration of the migration of residents to major towns like Shillong and Tura and neighboring state of Assam in search of livelihood, employment, and better opportunities.

**Strategic land use:** In the Meghalaya context, it is critical that land acquisition, land management and land use mechanisms reconcile the community-owned land and individual land. GIS and remote sensing-based techniques for land use mapping is of burning importance. The employment of land banks can ease the acquisition process whilst strengthening community and ADCs participation. Flexible design allows rapid response to changing needs whereas efficient land use can meet various social objectives in a more economical and effective way.

**Closing the manpower gap and upskilling planning professionals**: While government training institutions might have their limitations in terms of their knowledge base, the possibility of involving bringing in private institutions, non-governmental funded training organizations and research organizations can open avenues to fill in the knowledge, manpower and technical gaps. Such institutions include IIM Shillong, Institute of Chartered Financial Analysts of India University (ICFAI) Tura, NIC/NIIT Shillong, NEHU, NESAC besides the Guwahati College of Architecture and Planning, School of Planning and Architecture, New Delhi, CEPT University, Ahmedabad, IIT Kharagpur, NITI Aayog and others.
Private vendors would also need to be considered. Larger and smaller ULBs in the state have a deficiency in specialized technical staff in departments such as PHE. One corrective measure could be to create a cadre of engineers and other technical practitioners and allow for vertical and lateral movements across departments to facilitate a wider base of technical expertise. This could allow for lateral hiring of municipal professionals with specialized yet transferable skills.

**Decongestion strategies for enhanced transport and pedestrian mobility**: Traffic congestion and urban immobility will lead to economic losses, either due to loss of time or negative externalities such as pollution. Thus, measures for better mobility management, augmenting and improving public transport facilities, establishing a better parking management system, and pollution level checks have been proposed.

**Leveraging technology tools for efficient urban planning, governance, and service delivery:** The training of urban professionals in GIS, remote sensing, transport planning, urban planning, and statistical packages such as TRIPS, VISUM, LISREL, AMOS, etc. would augur well for data-driven, optimal decision making across multiple sectors. The computerization of property tax records could not only minimize errors that could arise from manual systems in terms of tax collection and recovery of arrears, but also ensure precious manpower can be utilized more efficiently in other tasks. Using IoT in delivery of solid waste

management services to track the location of waste containers, monitor the level of garbage deposited, identify locations with the highest demand, suggest the shortest route for solid waste collection optimization, and even interface with citizens to encourage disposal at times when the container can receive waste. Such IT enabled solutions advertently promote citizenship by making it more user-friendly.

**Provision of public infrastructure and welfare facilities to stimulate economic growth**: Providing public infrastructure and social services can promote economic development, and their existence is a necessary precondition for economic growth. It is because developments proximity to open spaces, recreational areas, and various types of public facilities attracts buyers and investors. Rising demand for such developments tends to push the property prices up which significantly stimulate the economic growth. Additionally, open spaces and the premises accommodating public facilities commonly have lower density than residential and commercial developments. They provide buffer zones in congested urban environment, which improve air flow between and within buildings. In addition, the citizens are more willing to travel on foot when accessibility of social facilities increases. In this way, total vehicular movement reduces, and pollutants emitted by vehicles and traffic noise also diminish substantially. Open spaces with greenery are recognized as major contributors to human health and social wellbeing. Finally, in addition to policy measures to regulate the activity of street vendors, provision of basic infrastructure for them is a catalyst to creating a vibrant urban economy.

The table below provides a summary of the proposed sector-wise project pipeline.

| Summary of projects | | | | |
|---|---|---|---|---|
| **Sector** | **State-level interventions** | | **City-level interventions** | |
| | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** |
| **Water supply** | 1. Water metering and planning for District Metering Areas (DMAs) to monitor the NRW | 1. Water metering and planning for District Metering Areas (DMAs) to monitor the NRW<br>2. Amendments in State Water Policy | **Shillong:** 1. GIS-based water supply system<br>**Tura:** 1. GIS-based water supply system<br>**Jowai:** 1. GIS-based water supply system | **Tura:** 1. Centralized regulatory implementing authority<br>**Nongstoin:** 1. Centralized regulatory implementing authority |
| **Sewerage and sanitation** | 1. Construction of wastewater treatment facilities in all cities and towns in Meghalaya<br>2. Construction of Faecal Sludge Treatment Plants (FSTPs)<br>3. Increasing access to mechanized desludging in Meghalaya by procuring of vacutug and double booster pump<br>4. Scheduled desludging of septic tanks | 1. Preparation of state regulatory guidelines and frameworks for Decentralised Wastewater Treatment System (DEWATS) and Faecal Sludge and Septage Management (FSSM) for the cities and towns in Meghalaya | **Shillong:** 1. Underground sewerage network for Shillong | NA |
| **Storm water drainage** | NA | 1. Preparation of drainage master plan for cities and towns in Meghalaya<br>2. Provision of city level drainage plan in state water policy | NA | NA |
| **Solid waste management** | 1. Zero landfill model - decentralized solid waste management<br>2. Procurement and deployment of smaller vehicles to increase the coverage and efficiency in waste collection | 1. Private sector and ADCs involvement in the decentralized system<br>2. Training and capacity building of SWM department | **Shillong:** 1. Stabilization of Marten landfill site of Shillong<br>2. Revenue generation from carbon credits from SWM in Shillong<br>**Tura:** 1. Internet of Things (IoT) integration in Tura | **Shillong:** 1. Revenue generation from carbon credits from SWM in Shillong |

| Summary of projects | | | | |
|---|---|---|---|---|
| **Sector** | **State-level interventions** | | **City-level interventions** | |
| | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** |
| **Transport** | 1. Expansion/upgradation of railway network | 1. Preparation of Parking Policy for entire state of Meghalaya<br><br>2. Revision in taxation policy for private vehicles in entire state of Meghalaya to encourage public transport and intermediate public transport<br><br>3. Purchase of e-vehicles in public transport sector and all government vehicles<br><br>4. Policy level initiatives such as Green Tax may be levied. To start with, this tax may be imposed on the commercial vehicles, and it can progressively be increased to cover private vehicles as well over a phased implementation strategy.<br><br>5. Control/regulation of ribbon development along the highways and bypasses as per IRC specifications (IRC: SP: 15-1996).<br><br>6. Enforcement of Guidelines on regulation and control of mixed traffic in urban areas as per IRC specifications (IRC: 70-2017). | **Shillong:** 1. Geometrical improvement and signalization of five junctions in Shillong<br><br>2. Construction of 0.5 km skywalk at Police Bazar junction in Shillong<br><br>3. Improvement of 6.15 km length of road network in Shillong<br><br>4. Development of off-street parking facility for a total ECS of 1,300 at 5 locations in Shillong<br><br>5. Construction of missing link along Outer Ring Road in Shillong<br><br>6. Construction of missing link along Inner Ring Road in Shillong<br><br>7. Provision of Traffic Rotaries, Circles, Islands and Roundabouts in Shillong – 5 locations<br><br>8. Proper Accommodation of Utility Services in Shillong -25 km length<br><br>9. Creation of Transport Nagars and Integrated Freight Complex around Shillong – 1 location of 10-acre area<br><br>**Tura:** 1. Geometrical improvement and signalization of four junctions in Tura<br><br>2. Improvement of 3.1 km length of road network in Tura<br><br>3. Development of off-street parking facility for a total ECS of 556 at 3 locations in Tura | **Shillong:** 1. Full pedestrianization of Police Bazar junction for selected hours in Shillong<br><br>2. Introduction of public transport services along four routes in Shillong<br><br>3. Introduction of feeder services from core city to ISBT in Shillong<br><br>4. Update of Comprehensive Mobility Plan of Shillong<br><br>5. Formation of Unified Transport Authority in Shillong |

| Summary of projects | | | | |
|---|---|---|---|---|
| **Sector** | **State-level interventions** | | **City-level interventions** | |
| | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** |
| | | | 4. Proper Accommodation of Utility Services in Tura – 15 km length<br><br>**Jowai:** 1. Geometrical improvement and signalization of three junctions in Jowai<br><br>2. Improvement of 6.3 km length of road network in Jowai<br><br>3. Development of off-street parking facility for a total ECS of 74 at 1 location in Jowai<br><br>4. Proper accommodation of Utility Services in Jowai - 10 km length | |
| **Land management** | NA | 1. Creation of land bank<br><br>2. GIS- based land records and land suitability for future urban development | NA | NA |
| **Urban planning and spatial growth** | NA | 1. Preparation of master plan for cities and towns in Meghalaya<br><br>2. Roadmap to ensure balanced equitable urbanisation growth of the small and medium towns in Meghalaya<br><br>3. Preparation of regional plan for Greater Shillong<br><br>4. Town Planning Scheme for cities and towns in Meghalaya<br><br>5. Transferable Development Rights (TDR) policy for Meghalaya<br><br>6. Inclusion of context specific urban planning amendments in Meghalaya Town and Country Planning Act, 1973<br><br>7. Consideration of hill areas to be incorporated in Meghalaya building bylaws | NA | NA |

| Summary of projects | | | | |
|---|---|---|---|---|
| **Sector** | **State-level interventions** | | **City-level interventions** | |
| | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** | **Infrastructure projects and technology-based interventions** | **Policy and institution-based interventions** |
| **Green spaces** | NA | NA | **Jowai:** 1. Myntdu riverfront development in Jowai<br><br>**Nongstoin:** 1. Nonbah riverfront development in Nongstoin | NA |
| **Housing** | NA | 1. Preparation of state housing policy<br><br>2. Demarcation of affordable housing in master plan | NA | **Tura:** 1. Housing improvement in Tura |
| **Urban agriculture** | NA | 1. Promoting urban agriculture through sack and container gardening | NA | NA |
| **Street vendors** | NA | 1. Identification and reservation for local markets in the development plan as recommended by the Street Vendors' Act of 2014<br><br>2. Preparation of detailed street vending plan<br><br>3. Designing integrated vending zones | NA | NA |
| **Institutional strengthening** | 1. Computerization of property tax records | 1. Establishing a municipal cadre<br><br>2. Capacity building of ULB and Department of Urban Affairs<br><br>3. Capacity building of Housing Department<br><br>4. Creating and delineating functions of an urban land bank institute/ land bank department<br><br>5. Leveraging Autonomous District Councils in service charge collection and service provision<br><br>6. Augmentation of own-source revenues of ULBs | **Shillong:** Establishing and training a separate cell within the Department of Urban Affairs to formulate the regional plan for Greater Shillong | NA |

The report has also provided town-wise investment requirements in the water supply, sewerage and sanitation, and the transport sector. For the water supply sector, we used the per capita investment requirements provided HPEC 2011 report and adjusted for inflation to arrive at the investment requirements.

*Summary costing table for water supply sector*

| A. Town | B. Approximate total investment needed by 2030 (INR crores) * | C. Existing / committed investment committed through various water supply schemes (INR crores) | D. Approximate additional investment (B-C) (INR crores) |
|---|---|---|---|
| Shillong | 90 | 412 (Improvements and Augmentation within Shillong Municipal Board Area under AMRUT 2.0) | No investment needed |
| Mawlai | 150 | 8.17 (Improvement and Augmentation of Mawlai Umjaiur and Kyntonmasar Water Supply Scheme under AMRUT 2.0) | ~140 |
| Tura | 115 | 50 (Tura Water Supply Scheme) | ~65 |
| Nongstoin | 100 | 58.5 (Augmentation of Nongstoin Urban Water Supply Scheme under AMRUT 2.0) | ~45 |
| Jowai | 60 | 47.47 (Jowai- Syntu Ksiar Urban Water Supply Scheme under AMRUT 2.0) | ~15 |
| Resubelpara | 55 | 275.65 (Resubelpara Urban Water Supply Scheme under AMRUT 2.0) | No investment needed |
| Baghmara | 80 | 120 (Baghmara Greater Water Supply Scheme Phase 2 under AMRUT 2.0) | No investment needed |
| Nongpoh | 65 | 75.18 (Nongpoh- GNWSSS under AMRUT 2.0) | No investment needed |
| **Approximate Total Investment** | | | **~INR 265 crores** |

We referred to the estimation methodologies in the CPHEEO Advisory Note for Septage Management in Urban India and the Manual for Faecal Sludge System by Swachh Bharat for the sewerage and sanitation sector.

*Summary costing table for sewerage and sanitation sector*

| City | A. Projected Population as of 2030 | B. Water Consumption @135 LPCD | C. Sewerage Generation (85% of B) (L/d) | D. Capacity of STP required (MLD) | E. Capital expenditure need for 100% coverage until 2030* (INR crores) |
|---|---|---|---|---|---|
| Shillong | 165,195 | 22,301,349 | 18,956,147 | 18.96 | 140 |
| Mawlai | 109,442 | 14,774,722 | 12,558,514 | 12.56 | 93 |
| Tura | 104,886 | 14,159,603 | 12,035,663 | 12.04 | 89 |
| Nongstoin | 43,534 | 5,877,125 | 4,995,556 | 5.00 | 37 |
| Jowai | 37,357 | 5,043,258 | 4,286,769 | 4.29 | 32 |
| Resubelpara | 29,239 | 3,947,264 | 3,355,175 | 3.36 | 25 |
| Baghmara | 29,148 | 3,934,924 | 3,344,685 | 3.34 | 25 |
| Nongpoh | 27,853 | 3,760,153 | 3,196,130 | 3.20 | 24 |
| **Approximate total capital expense needed for DEWAT system in project towns** | | | | | **~ INR 465 crores** |

| City | Population 2030 | Faecal sludge Generation until 2030 (g/ day) | Required FSTP Capacity for 2030 (cu.m./ day) | Current FSTP capacity under construction | Project cost* (INR crores) |
|---|---|---|---|---|---|
| Shillong | 165,195 | 4,460,269 | 247.8 | 350 | No need for investment |
| Mawlai | 109,442 | 2,954,944 | 164.2 | - | 8 |
| Tura | 104,886 | 2,831,920 | 157.3 | - | 8 |
| Nongstoin | 43,534 | 1,175,425 | 65.3 | - | 3 |
| Jowai | 37,357 | 1,008,651 | 56.0 | 50 | 1 |

| City | Population 2030 | Faecal sludge Generation until 2030 (g/ day) | Required FSTP Capacity for 2030 (cu.m./ day) | Current FSTP capacity under construction | Project cost* (INR crores) |
|---|---|---|---|---|---|
| Resubelpara | 29,239 | 789,452 | 43.9 | - | 2 |
| Baghmara | 29,148 | 786,984 | 43.7 | - | 2 |
| Nongpoh | 27,853 | 752,030 | 41.8 | - | 2 |
| **Approximate total capital expense needed for the construction of FSTP in project towns** | | | | | **~INR 30 crores*** |

** City wise project costs are rounded up to the nearest whole number greater than 0. Total investment was rounded to the highest five in the units place.*

Finally, we used market information to arrive at the investment requirements for the transport sector.

### *Summary costing table for transport sector*

| S. No | Town | Intervention | Approximate cost (INR crores) |
|---|---|---|---|
| 1. | Shillong | Geometrical improvement and signalization of five junctions in Shillong | 10 |
| 2. | | Construction of 0.5 km skywalk at Police Bazar junction in Shillong | 30 |
| 3. | | Improvement of 6.15 km length of road network in Shillong | 61.5 |
| 4. | | Development of off-street parking facility for a total ECS of 1300 at 5 locations in Shillong | 130 |
| 5. | | Construction of 3 km missing link along outer ring road in Shillong | 150 |
| 6. | | Construction of 7 km missing link along inner ring road in Shillong | 350 |
| 7. | | Provision of traffic rotaries, circles, islands, and roundabouts in Shillong – 5 locations | 3.75 |
| 8. | | Proper accommodation of utility services in Shillong -25 km length | 50 |
| 9. | | Creation of transport nagars and Integrated Freight Complex around Shillong – 1 location of 10-acre area | 30 |
| **Approximate town total** | | | **~INR 820 crores** |
| 10. | Jowai | Geometrical improvement and signalization of three junctions in Jowai | 6 |
| 11. | | Improvement of 6.3 km length of road network in Jowai | 63 |
| 12. | | Development of off-street parking facility for a total ECS of 74 at 1 location in Jowai | 7.4 |
| 13. | | Proper accommodation of utility services in Jowai - 10 km length | 20 |
| **Approximate town total** | | | **~INR 100 crores** |
| 14. | Tura | Geometrical improvement and signalization of four junctions in Tura | 8 |
| 15. | | Improvement of 3.1 km length of road network in Tura | 31 |
| 16. | | Development of off-street parking facility for a total ECS of 556 at 3 locations in Tura | 55.6 |
| 17. | | Proper accommodation of utility services in Tura – 15 km length | 30 |
| **Approximate town total** | | | **~INR 125 crores** |
| **Approximate total across towns** | | | **~INR 1,045 crores** |

**All total figures are rounded to the highest five in the units place.*

The detailed calculations are all catalogued in the Annexure. Altogether, the total investment across these three sectors for all eight project towns amounts to **approximately INR 1,725 crores** for 2030, as outlined in the table below. This amounts to a **per capita investment of INR 31,556** across the eight project towns for 2030.

| A. Town | B. Water supply (INR crores) | C. Sewerage and sanitation (INR crores) | D. Transport (INR crores) | E. Total* (B+C+D) |
|---|---|---|---|---|
| Shillong | NA | 140 | 820 | 960 |
| Mawlai | 140 | 101 | NA | 241 |
| Tura | 65 | 97 | 125 | 222 |
| Nongstoin | 45 | 40 | NA | 85 |
| Jowai | 15 | 33 | 100 | 133 |
| Resubelpara | NA | 27 | NA | 27 |

| A. Town | B. Water supply (INR crores) | C. Sewerage and sanitation (INR crores) | D. Transport (INR crores) | E. Total* (B+C+D) |
|---|---|---|---|---|
| Baghmara | NA | 27 | NA | 27 |
| Nongpoh | NA | 26 | NA | 26 |
| **Approximate total investment** | | | | **~ INR 1,725 crores** |

** City wise investment costs are rounded up to the nearest whole number greater than 0. Total investment was rounded to the highest five in the units place.*

The report finally also elucidates on various sources of funding that the ULBs and the state can leverage to meet these investment requirements. They are explained in summary in the table below.

| Source of funding mechanism | Brief explanation |
|---|---|
| Micro-PSP and volumetric billing for water supply sector | Involve small-scale private enterprises in providing water services at local level. These can include small businesses, community-based organizations, or individual entrepreneurs. Additionally, volumetric billing could serve as an avenue for collecting user charges and expanding the PHEDs revenue base. |
| PSP Annuity model for construction of Decentralised Wastewater Treatment Plant and Faecal Sludge Treatment Plant | Capital expenditure is funded by the state government, while operational expenditure is borne by the state or local government, and operations are provided by the private sector, SHGs, or NGOs. The state government would need to make adequate budgetary provision for the city or town, as estimated by ULBs under the city level Decentralized Wastewater Treatment System (DEWATS) and Faecal Sludge and Septage Management (FSSM) plan. |
| Sale of carbon credits from municipal solid waste projects | This will help promote investment by generating a revenue stream for municipalities. This can be operational as a Clean Development Mechanism (CDM) project, which is a carbon offset scheme run by the United Nations. |
| Sources of income for transport projects | This includes Government Grant Fund, temporary shop taxes, parking fees, leasing shops developed through Public-Private Partnerships (PPPs), stamp duties, and MP/MLA funds. |
| Viability Gap Funding (VGF) | Introduced by the Ministry of Finance to assist PPP infrastructure projects with at least 40% private equity. This funding can be in the form of grants, loans, support, or subsidies capped at 20% of the project cost, and applies to various sectors like transportation, urban infrastructure, SEZs, and tourism. The Government of Meghalaya can also offer VGF support, considering all costs and incentives provided by relevant government entities. |
| PPPs for transport sector | Some of the projects in the transport sector amenable for PPPs include a) parking (parking fees), b) advertisement on buses, in bus terminals and other public places such as bus stops, c) advertisements along footpaths, d) bus terminal, and e) bus operation |
| PPPs for affordable housing | Some avenues to incentivize private developers would be through direct benefit transfers (DBT), annuity-based subsidized housing or through a mixed development cross subsidizing scheme. |
| Leveraging traditional institutions in service charge collection and service provision | Service charge collection could be made the responsibility of traditional institutions in the areas where they operate. An ESCROW fund can be created, sharing revenue with the ULBs responsible for service provision. Transparency in the use of funds can be ensured by using a SPV or blockchain mechanism. Moreover, ULBs could involve ADCs and local actors in the SWM and/or water supply value chain with a revenue-sharing approach based on performance. |
| Leveraging the scheme of financial assistance to states for capital expenditure | In FY22, the Ministry of Finance, Government of India has decided to provide an additional amount of up to INR 15,000 crore to States as interest free 50-year loan for spending on capital projects. Out of this, INR 2,600 crores has been earmarked for the North-East and hill states. The Government of Meghalaya could leverage this scheme for key urban infrastructure projects. |
| Devolution of performance-based grants (PBGs) from state government to ULBs | To implement PBGs, the state government could establish clear KPIs and offer financial incentives to ULBs achieving or exceeding them. An independent agency can be created to monitor and evaluate performance and allocate grants based on ULB rankings, while accounting for ULBs that might be relatively socio-economically deprived. |
| Approaching multilateral finance institutions | Multilateral finance institutions such as International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC), Asian Development Bank (ADB), Kreditanstalt für Wiederaufbau (KfW), Japan International Cooperation Agency (JICA), and Agence Française de Développement (AFD) offer a variety of financing |

| Source of funding mechanism | Brief explanation |
|---|---|
| | mechanisms such as loans (concessional and non-concessional), loan guarantees, equity investments, and grants. |
| Property tax reform | Measures to augment property taxes include computerization of property tax records, GIS mapping of properties, and establishing a municipal valuation committee, among others. |

In conclusion, we believe the proposed urban infrastructure, planning, and capacity building projects align with Meghalaya's urban renewal strategy. Some aspects could potentially be replicated in other Northeast states facing similar challenges. The report's recommendations could serve as a guide for the overall urban development of the region.