



Government of the People's Republic of Bangladesh

Ministry of Housing and Public Works

Urban Development Directorate

82 Segunbagicha, Dhaka-1000

PREPARATION OF DEVELOPMENT PLAN FOR MEHERPUR ZILLA

REPORT ON ASSIGNMENT-7

Spatial Transformation of Physical Feature Data with National Plan and Policies

August 2025

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Urban Planner

ASSIGNMENT 7: SPATIAL TRANSFORMATION OF PHYSICAL FEATURE DATA WITH NATIONAL PLAN AND POLICIES



September, 2025

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PREPARAION OF DEVELOPMENT PLAN FOR

MEHERPUR ZILLA



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Summary of Assignment-7

Drawing on the multiple analyses you've provided—including the emotional maps, the land suitability assessment, and the adaptive cycle visualization—we can prepare a cohesive land use proposal for Gangni Paurashava. This approach moves beyond traditional planning by integrating human-centered data with objective spatial analysis.

1. Urban Core & Revitalization Zone

Analysis Reference: This proposal references the areas identified as "Highly Suitable" for development on the suitability map (green zones in Wards 1, 2, and 6). It also directly addresses the hotspots of Disgust, Fear, and Anger found on both the individual and newspaper emotion maps within these same wards. The adaptive cycle map places these areas in the "Growth" phase.

Land Use Proposal:

Designate a mixed-use, high-density urban core. The goal is to concentrate commercial, residential, and institutional development in these areas to promote compact, efficient growth.

2. Residential and Community Amenity Zone

Analysis Reference: This proposal is based on the emotional maps, which show a predominance of Happiness and Love in wards like 4, 5, 7, and 8. The land suitability map identifies these areas as "Less Suitable" for intensive development, and the adaptive cycle map places them in the "Conservation" or "Release" phases.

Land Use Proposal:

Zone these areas for low-to-medium density residential use. The focus should be on preserving the high quality of life and positive emotional landscape that already exists.

3. Green Belt & Agricultural Preservation Zone

Analysis Reference: This proposal is a direct response to the vast areas identified as "Less Suitable" for urban development on the suitability map. The land cover projection map also shows these areas as dominant in Agriculture and Vegetation in 2043. The adaptive cycle map places the periphery in the "Release" phase, indicating a high risk of unmanaged sprawl.

Land Use Proposal:

Zone a significant portion of the outer wards (particularly in Wards 4, 5, 8, and 9) as a Green Belt and Agricultural Preservation Zone.

4. Transitional & Institutional Zone

Analysis Reference: This proposal accounts for the areas identified as "Moderately Suitable" on the suitability map, and the scattered "Reorganization" and "Surprise" zones from the adaptive cycle and emotion maps.

Land Use Proposal:

Designate these areas as a Transitional and Institutional Zone. This provides a buffer between the dense urban core and the green belt.

(Sanjib Saha)

Urban Planner

Newspaper Emotion Analysis Outcome

A clear concentration of negative emotions, with a large area of Disgust and Fear covering the central wards, specifically Ward No. 02, Ward No. 04, and Ward No. 08. This suggests that these areas are frequently associated with issues such as urban decay, crime, which are often reported in the media.

A broad swathe of Anger and Sadness covers a large portion of the northern wards (03, 05, and 06) and extends into the eastern wards (07, 08, and 09). This indicates that public discourse in these areas is often focused on civic grievances or other problems that evoke these emotions.

Small pockets of Happiness and Love are visible, particularly in Ward No. 01 and the southern part of Ward No. 02. These areas likely represent a better quality of life or a strong sense of community, though they are much less prominent than the negative emotional zones.

Proposed Landuse Zoning According to the Analysis

Based on the emotional analysis from the map, the following land use zoning proposals can be made to address the identified problems and improve the quality of life in Gangni Paurashava:

- **Urban Core and Revitalization Zone:** The areas with high concentrations of **Disgust** and **Fear** (Wards 02, 04, and 08) should be zoned as a **Revitalization Zone**. This zoning would prioritize projects aimed at improving public health and safety.

Proposals: Focus on upgrading drainage and sanitation systems, improving waste management services, and enhancing public safety infrastructure such as street lighting and police presence. This can directly mitigate the feelings of disgust and fear.

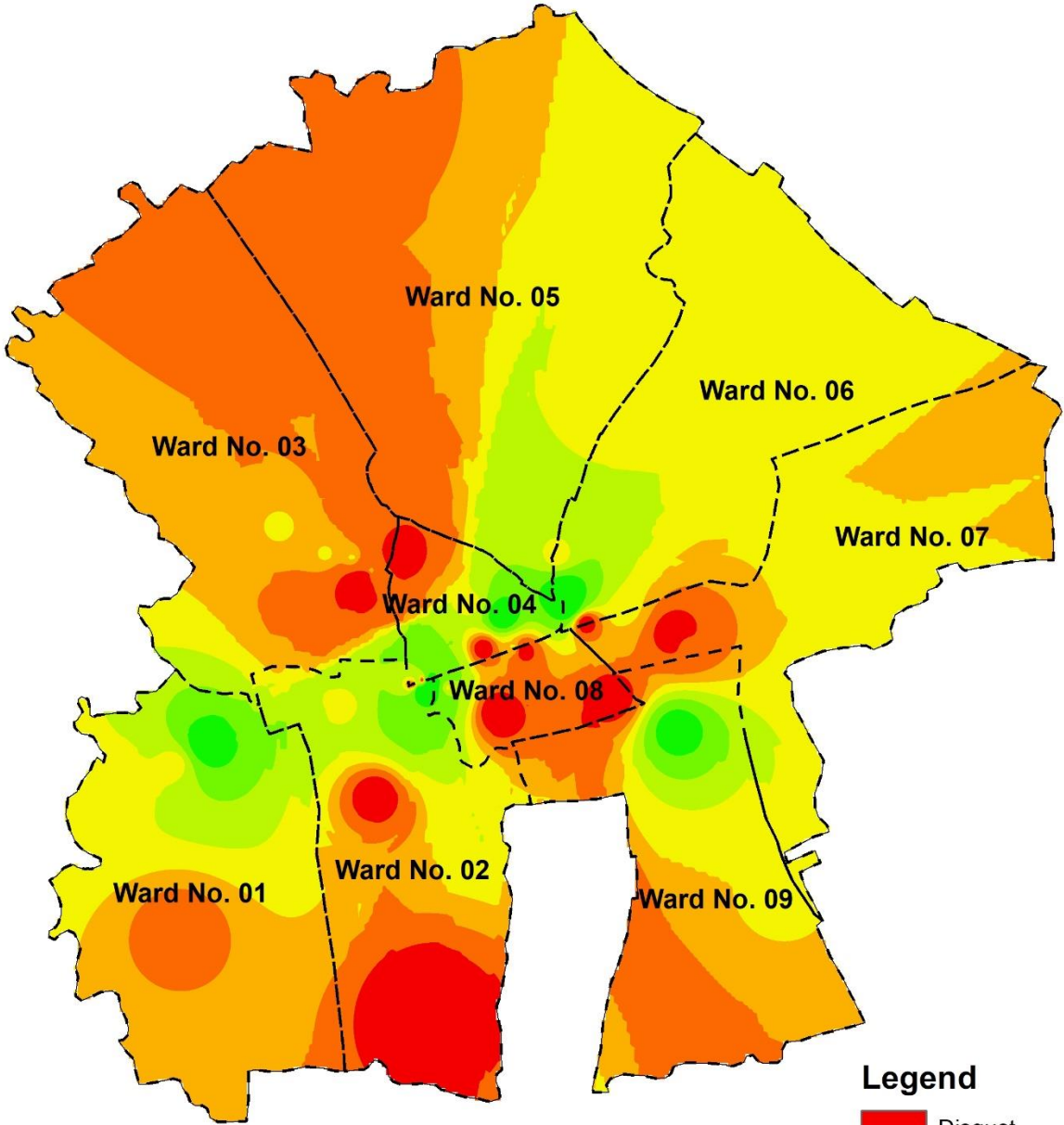
- **Mixed-Use and Community Engagement Zone:** The wards with widespread **Anger** and **Sadness** (03, 05, 06, 07, 08, and 09) should be zoned for **mixed-use development** with a strong emphasis on **community amenities**.

Proposals: Create more public spaces, such as parks, community centers, and recreational facilities. This can provide residents with a forum to engage with each other and address civic issues.

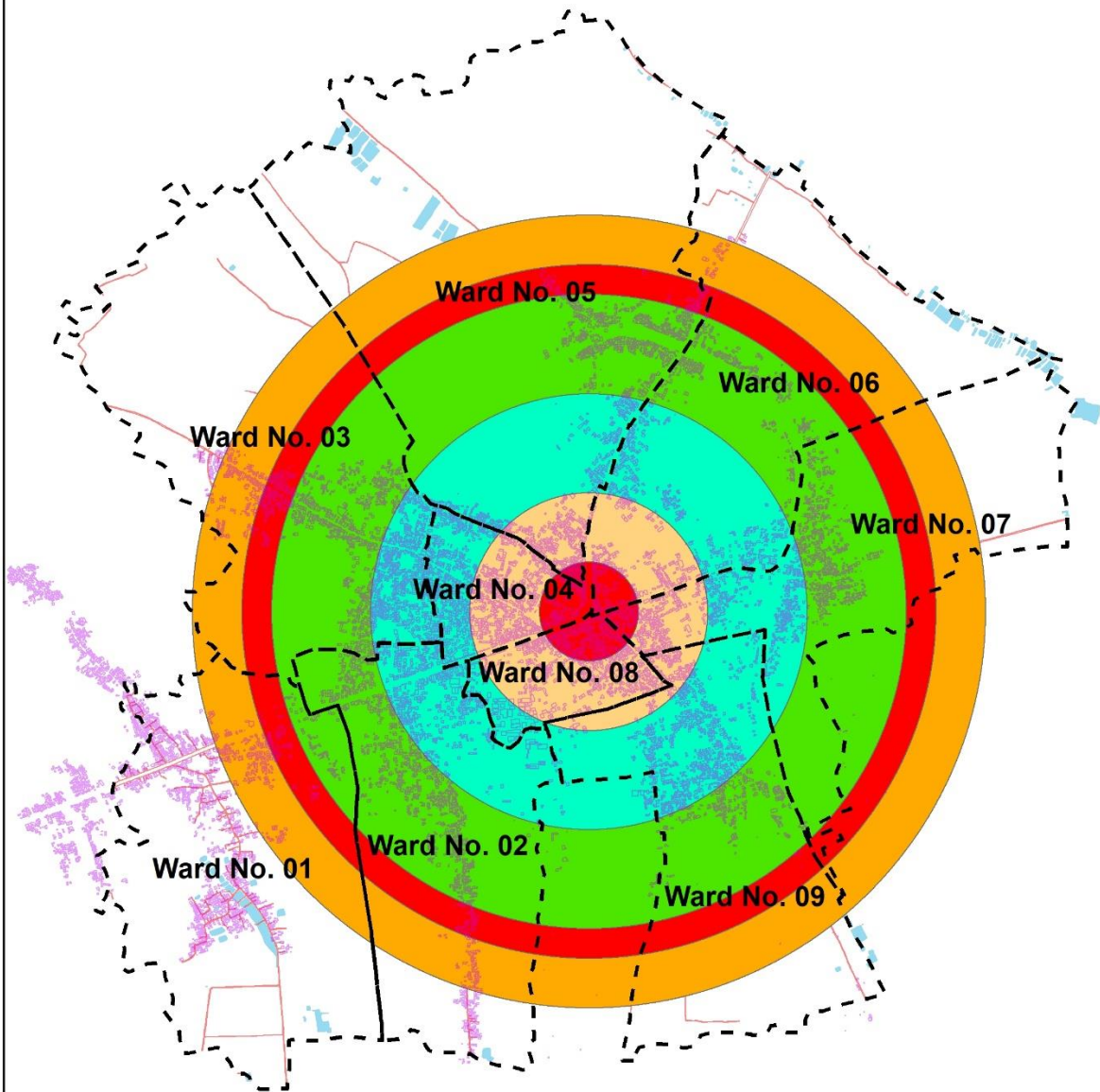
- **Residential and Preservation Zone:** The areas with positive emotions like **Happiness** and **Love** (Wards 01 and 02) should be zoned to preserve their existing character.

Proposals: Implement zoning regulations that protect the low-to-medium density residential feel of these areas. This would prevent the kind of unmanaged, high-density development that could introduce the negative problems seen in other wards.

Emotion Analysis from Newspaper Information



Adaptive Cycle Analysis from Newspaper Emotion



Adaptive Cycle

- Release (Ω)
- Reorganization (α)
- Growth (r)
- Conservation (K)

Adaptive Cycle Analysis

The map's core is a visualization of the four phases of the adaptive cycle:

Release: This phase signifies a breakdown or collapse, often triggered by a disturbance or an accumulation of unaddressed problems, and is associated with negative emotions like disgust, fear, and anger. This zone is the outermost ring on the map, covering little parts of all wards.

Reorganization: This phase represents innovation and renewal after a release, where the system reorganizes itself into a new state. This phase appears as small, scattered pockets, indicating that these are newly emerging areas or zones of revitalization.

Growth: This phase is associated with development, accumulation, and positive emotions like happiness and love. The map shows this phase as a central core, encompassing Ward No. 2, 3, 4, 5, 6, and parts of 9. This suggests these areas, despite some negative emotions, are experiencing active growth.

Conservation: This phase represents stability and maturity, where the system has reached a peak of accumulated resources. On the map, this zone surrounds the "Growth" phase and includes portions of Ward No. 2, 3, 5, 7, and 9.

Proposed Landuse Zoning based on this Outcome

The adaptive cycle map provides a powerful framework for strategic, dynamic zoning that goes beyond traditional land use.

Release Zone→ Transitional/Rural-Urban Interface: The areas in the Release phase, which are often at the periphery, should be zoned as a **Transitional/Rural-Urban Interface**. These zones are at high risk of unmanaged sprawl and could benefit from strategic planning. Zoning here should include **agricultural preservation, eco-sensitive zones, and controlled low-density development** to manage the transition from rural to urban land use. The goal is to prevent a complete collapse of the agricultural landscape.

Reorganization Zone→ Institutional and Innovation Hubs: The small, isolated areas in the Reorganization phase should be zoned for **Institutional and Special Purpose Use**. These zones represent opportunities for new development and innovation. This could include new public facilities, schools, hospitals, or innovation hubs that serve as catalysts for future growth and sustainable development.

Growth Zone → Mixed-Use Core with Modernization: The areas identified in the Growth phase, particularly the dense central wards, should be zoned as a **Mixed-Use Core**. The planning here should focus on **compact development, infill projects, and modernizing infrastructure**. The goal is to sustain the positive growth while addressing existing congestion and infrastructure issues.

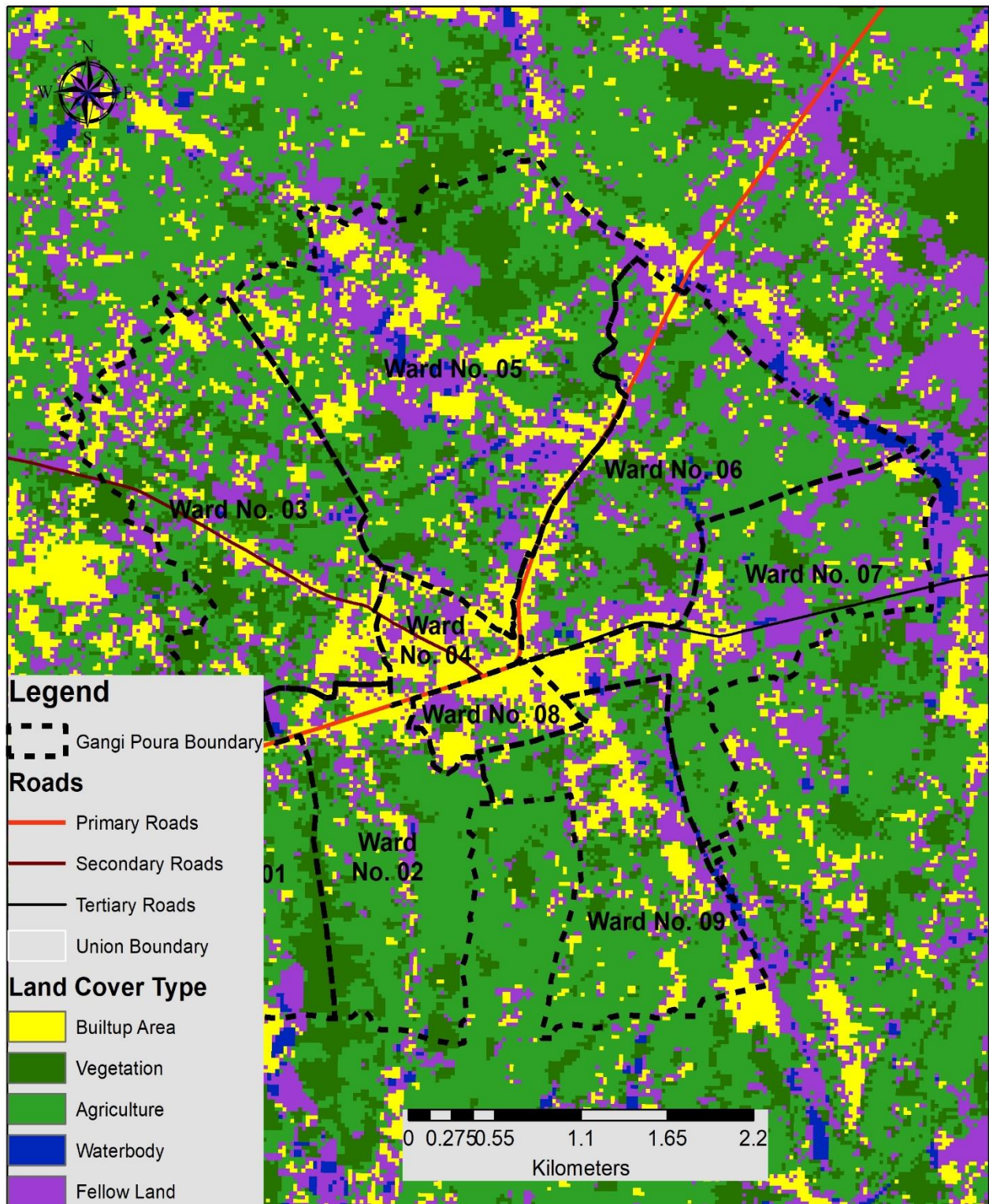
Conservation Zone → Residential Preservation with Upgrades: The Conservation phase zones, which represent stable areas, should be zoned for **Residential Preservation**. The focus here is to maintain the existing character and quality of life while introducing targeted upgrades to infrastructure and amenities. This zoning would prevent unmanaged high-density development that could disrupt the established stability.

Land Cover Projection to 2043

Based on the land cover projections for 2043, we can propose a strategic zoning plan for Gangni Pourashava:

- **Urban Expansion Zone:** The areas projected as a dense built-up area, particularly the central wards and land along the primary roads, should be zoned as an **Urban Expansion Zone**. This zone would be designated for high-density, mixed-use development, including commercial, residential, and institutional uses. The goal here is to manage the inevitable urban growth in a compact and organized manner.
- **Agricultural Preservation Zone:** The large areas of projected agricultural land, especially in Ward 1, 2, 3, 5, 6, 7 and 9 should be zoned as an **Agricultural Preservation Zone**. This is crucial to protect the municipality's food security and rural livelihoods. Zoning regulations would restrict high-density urban development in these areas.
- **Green Belt and Conservation Zone:** The projected areas of vegetation and water bodies should be designated as a **Green Belt and Conservation Zone**. This zone would serve as the city's ecological lungs, providing recreational spaces, mitigating the heat island effect, and helping to manage urban drainage. Development in this zone would be restricted to low-impact recreational or institutional uses.
- **Transitional/Fellow Zone:** The areas of projected fellow land could be zoned as a **Transitional Zone**. This zone could be used as a land bank for future development, but with clear regulations to prevent unplanned sprawl. It could also be used for specific low-impact uses such as institutional campuses or agro-industrial facilities, providing a buffer between urban and rural areas.

Land Cover Projection to 2043



Existing Landuse

The map reveals a clear pattern of a compact urban core surrounded by an extensive agricultural landscape. The urban development follows a linear pattern along the road networks, suggesting that future growth is likely to occur in this same manner unless a new, strategic plan is implemented. The dominance of agriculture highlights the critical need to balance future urban growth with the preservation of agricultural land.

Land Use Categories

The map uses a color-coded legend to represent different land use categories, with a table providing the area in acres and the percentage of the total land occupied by each.

Table: Existing Landuse of Gangni Pourashava

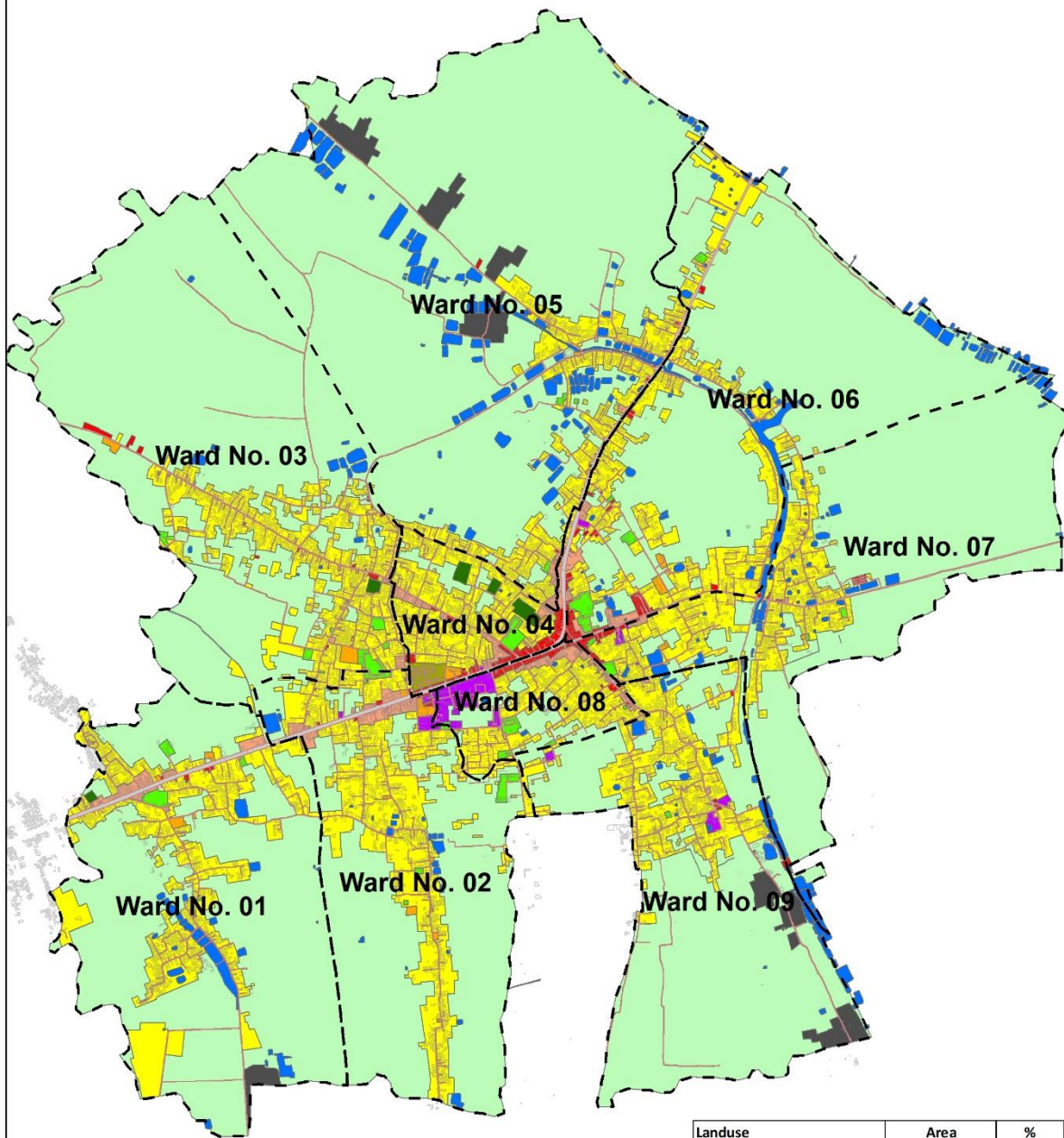
Landuse	Area	%
Administrative	15.46	0.36
Agricultural	3082.46	72.03
Commercial	23.39	0.55
Community Facilities	11.04	0.26
Education & Institution	24.17	0.56
Health Facilities	4.18	0.10
Industry	47.81	1.12
Mixed Use	34.37	0.80
Residential	810.54	18.94
Circulation Network	98.32	2.30
Utility Services	0.21	0.00
Open Space & Recreation	6.42	0.15
Waterbody	120.83	2.82
Total	4279.20	100.00

Agriculture: This is by far the **dominant land use**, covering **72.03%** of the municipality. It is most prevalent in the outer wards, particularly Ward No. 01, 05, 06, and 07, highlighting Gangni's strong agricultural base and its rural-urban character.

Residential: Residential areas are concentrated in the central wards (02, 04, and 08) and along the primary road network. This category accounts for **18.94%** of the total land, making it the second most significant land use.

Mixed Use: This category, at **0.86%**, is also a significant land use, indicating areas where commercial and residential uses are integrated, especially in the urban core.

Existing Landuse of Gangni Pourashava



Existing Landuse

 Administrative	 Industry
 Agriculture; Agricultural	 Mixed Use
 Circulation Network	 Open Space & Recreation
 Commercial	 Residential
 Community Facilities	 Transportation
 Education & Institution	 Utility Services
 Health; Health Facilities	 Waterbody

Landuse	Area	%
Administrative	15.46	0.36
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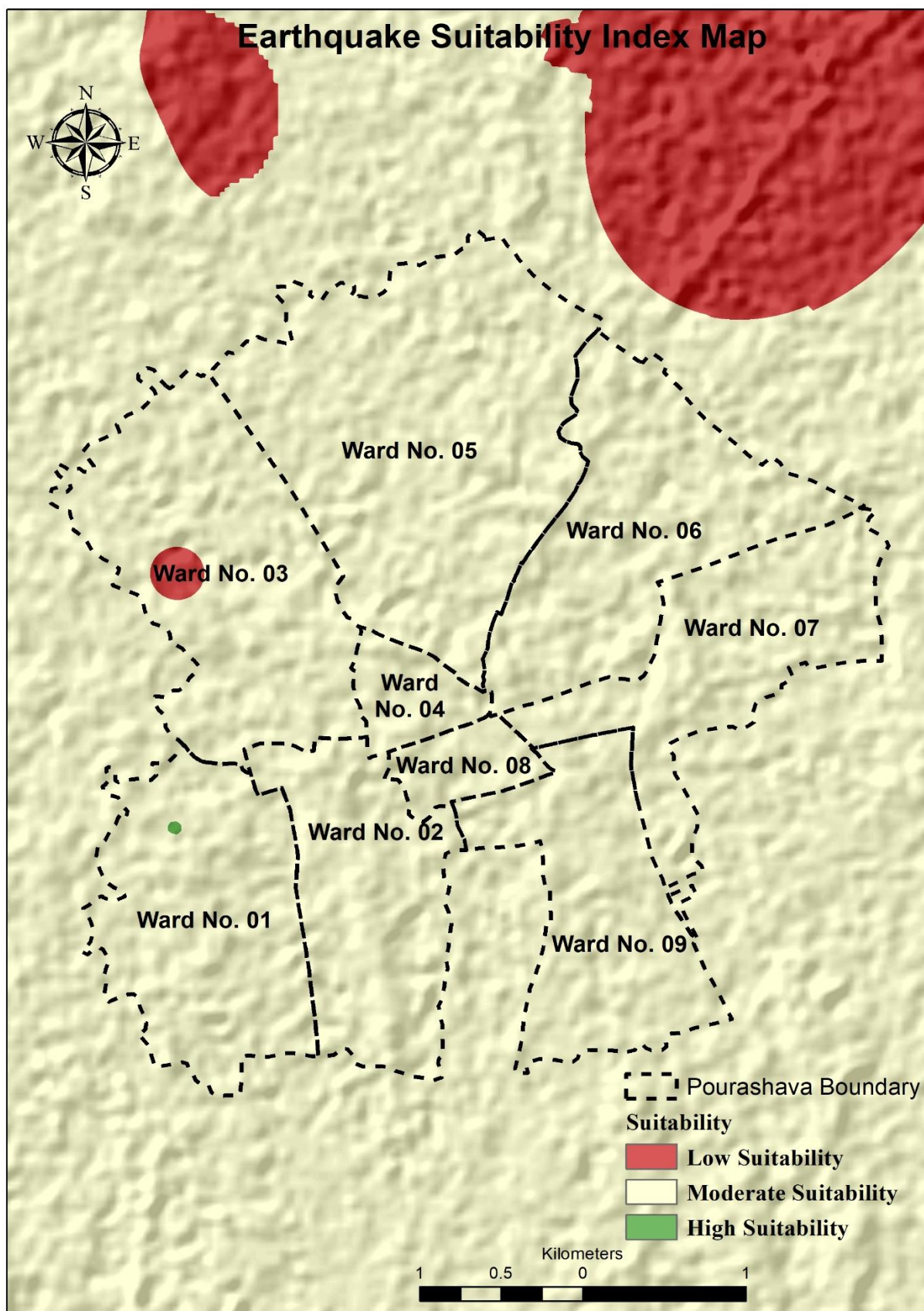
- **Other Land Uses:** The map also identifies smaller, scattered areas for **Commercial (0.55%)**, **Education & Institution (0.56%)**, and **Industry (1.12%)**. These are located primarily within or on the fringes of the denser residential areas.
- **Open Space:** Open Space & Recreation covers a very small area at **0.15%**, indicating a potential need for more public green areas.

Earthquake Suitability Index Map

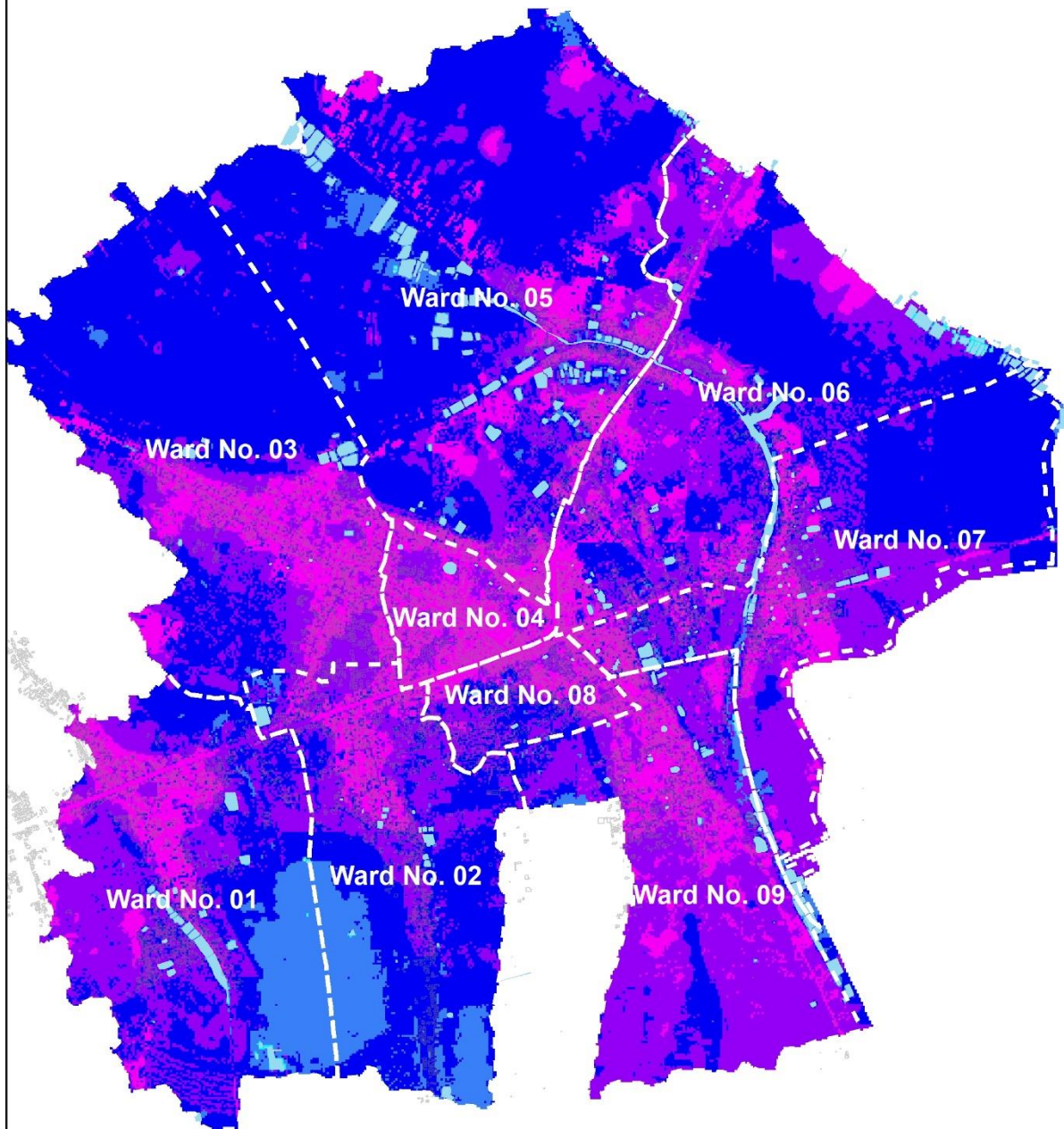
The map categorizes land into three levels of suitability for construction, with the goal of minimizing earthquake risk.

- **Low Suitability (Red):** The map identifies no portions of the municipality, as having **Low Suitability** for construction due to seismic factors.
- **Moderate Suitability (Beige):** The majority of the municipality falls into the **Moderate Suitability** category. This suggests that while these areas are not completely safe from seismic risk, they are less vulnerable than the low-suitability zones. Construction in these areas would likely require specific engineering standards and precautions to ensure structural integrity.
- **High Suitability (Green):** Only a few, very small pockets of land are classified as having **High Suitability**. These areas, shown in green, are the safest for construction from an earthquake perspective due to favorable ground conditions.

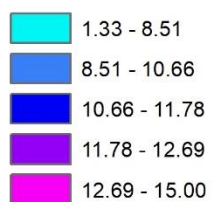
This map is a critical tool for urban planning and zoning. It provides a scientific basis for guiding development away from the most hazardous areas and for implementing stricter building codes in the moderately suitable zones. The large areas of low suitability highlight a significant challenge for Gangni in managing future growth while ensuring public safety.



Digital Elevation Model of Gangni Pourashava



Gangni Paurashava DEM



A **Digital Elevation Model (DEM)** is a 3D representation of a terrain's surface, showing the elevation of the ground at different points. On this map, the elevation is represented by a color gradient, with blue and magenta indicating lower-lying areas and other colors indicating higher ground.

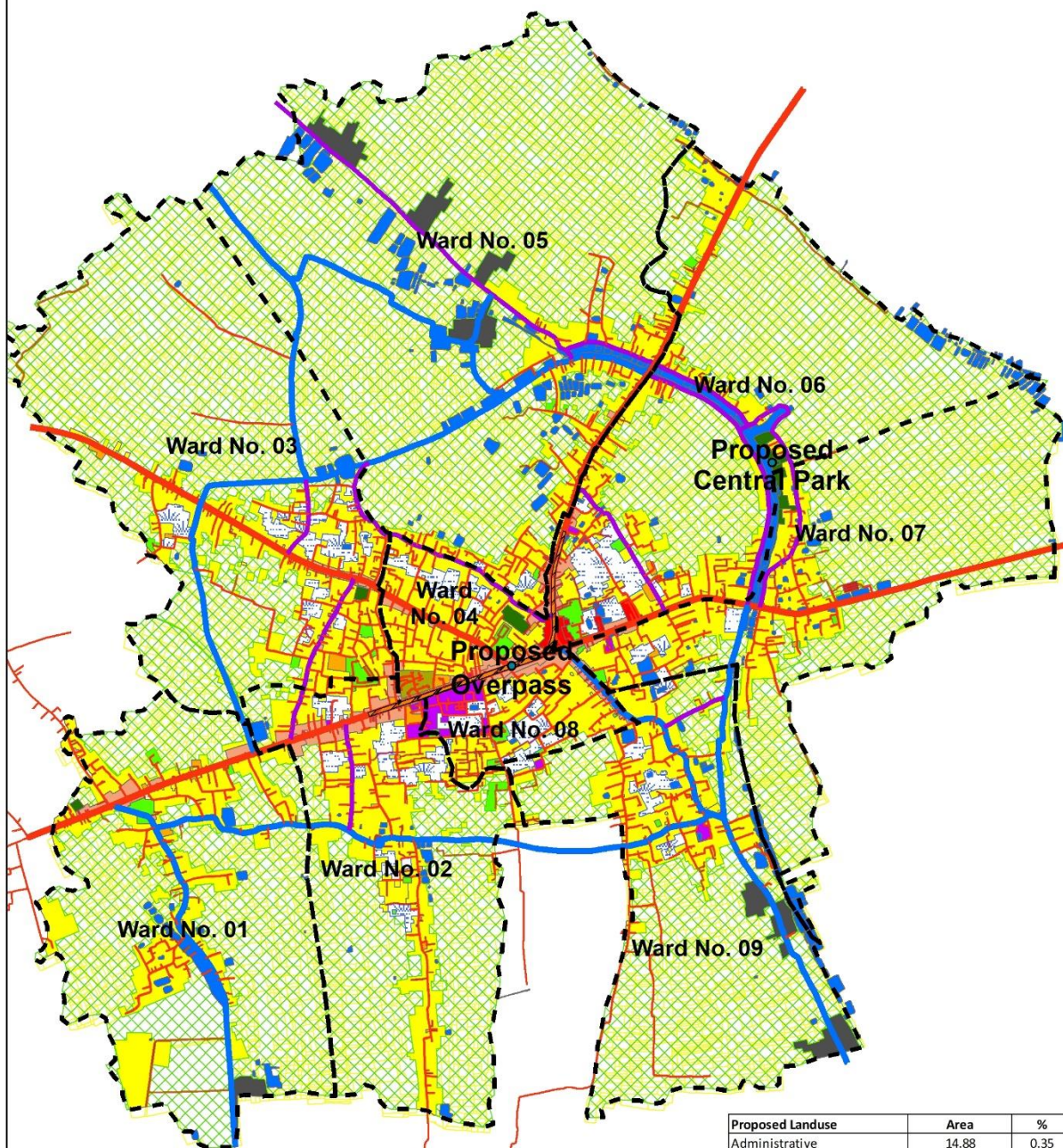
- **Low-Lying Areas:** The map shows that a significant portion (Ward 1,2, 3, 5, 6 and 7) of the municipality, particularly in the southern and eastern parts, is low-lying. These areas, colored in shades of blue, are more susceptible to flooding and waterlogging, making them less suitable for construction.
- **Higher Ground:** The western and northern parts (Ward 1, 2, 3 and 9) of the municipality are on higher ground, represented by the magenta and other shades. These areas are more suitable for urban development because they are less prone to flooding and water accumulation.
- **Urban Core:** The urban core, which includes Wards 04 and 08, appears to be located on a mix of elevations, which could pose challenges for drainage and urban infrastructure.

Proposed Landuse

Table: Proposed Landuse of Gangni Pourashava

Proposed Landuse	Area	%
Administrative	14.88	0.35
Agriculture	2963.04	69.24
Circulation Network	98.35	2.30
Commercial	7.15	0.17
Community Facilities	10.41	0.24
Education & Institution	24.82	0.58
Health Facilities	4.18	0.10
Industry	47.81	1.12
Mixed Use	54.01	1.26
Open Space & Recreation	9.38	0.22
Residential	791.47	18.50
Urban Green Space	118.09	2.76
Utility Services	0.21	0.00
Waterbody	135.40	3.16
Total	4279.20	100.00

Proposed Landuse of Gangni Pourashava



Proposed Landuse

 Administrative	 Industry
 Agriculture	 Mixed Use
 Circulation Network	 Open Space & Recreation
 Commercial	 Residential
 Community Facilities	 Transportation
 Education & Institution	 Utility Services
 Health; Health Facilities	 Waterbody

Proposed Road

 Primary
 Secondary
 Tertiary
 Access

Proposed Landuse	Area	%
Administrative	14.88	0.35
Agriculture	2963.04	69.24
Circulation Network	98.35	2.30
Commercial	7.15	0.17
Community Facilities	10.41	0.24
Education & Institution	24.82	0.58
Health Facilities	4.18	0.10
Industry	47.81	1.12
Mixed Use	54.01	1.26
Open Space & Recreation	9.38	0.22
Residential	791.47	18.50
Urban Green Space	118.09	2.76
Utility Services	0.21	0.00
Waterbody	135.40	3.16
Total	4279.20	100.00