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 ZILA

REPORT ON ASSIGNMENT- 06

Spatial Transformation of Socio-economic survey output such as spatial transformation, comparison between PRA and Socio- economic etc

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Existing Situation:

Ward 1, located in the northwestern part of Meherpur Municipality, functions as a mixed residential and agricultural zone with emerging commercial activities. According to the 2022 Bangladesh Bureau of Statistics (BBS), the ward is home to 6,645 residents, with projected growth to 8,847 by 2047. The literacy rate stands at 86.43% (Male: 89.29%, Female: 84.26%), and the student population (5–29 yrs) is 1,025, indicating a young demographic profile with significant educational needs.

The ward's economy is predominantly agriculture-based (40% farmers), supported by business (30%), driving/transport (10%), and service jobs (8%), while smaller shares are engaged in education, medical services, and religious activities. Transportation is largely non-motorized, with walking (40.2%), rickshaw (31.8%), and cycling (15.4%) dominating, while motorcycles (10.7%) and buses (0.8%) reflect limited motorized use. This reliance highlights the need for safe, pedestrian- and rickshaw-friendly infrastructure.

Physical features include a drainage network of 9.95 km covered and 0.78 km uncovered drains, though seasonal waterlogging persists in low-lying agricultural lands (3.01–12.01 m). Residential areas at higher elevations (12.3–15.7 m) remain relatively secure from flooding. The building stock is varied—Katcha: 61, Pucca: 913, Semi-Pucca: 1,030, and Tin Shade: 865—with the majority being single-storied (1,020 buildings), alongside limited vertical expansion.

Land use shows a balance between agriculture (50.66 acres) and residential areas (51.90 acres), supported by commercial (2.18 acres) and administrative land (26.40 acres). However, the complete absence of designated educational land use and very limited open spaces pose challenges for future community services. Utility services remain basic, with only 35 formal disposal points and no public toilets, while most households depend on cylinder gas for cooking.

Emotional-spatial analysis identifies mixed zones: the Functional Emotion Zone reflects love and happiness in the active commercial and institutional core; the City Soul Zone captures vibrant community hubs with emotions of love, happiness, and sadness; peripheral Fade Zones show sadness and anger due to isolation; and Revival Zones in agricultural land carry emotions of sadness and fear, but also potential for transformation.

Overall, Ward 1's demographic growth, reliance on agriculture and non-motorized transport, and lack of adequate open/recreational spaces emphasize the need for integrated, elevation-sensitive, and community-centered planning interventions to enhance livability and resilience.

The following tables present the existing condition, problem identification, and action plan, each with a clear link to the other, ensuring traceability from observation to solution.

Feature	Existing Condition
Population & Projection	2022: 6,645 people. Projected 2047: 8,847. *(Source: BBS 2022)*
Education	Literacy rate (5+ yrs): 86.43% (Male: 89.29%, Female: 84.26%). Student population (5–29 yrs): 1025. *(Source: BBS 2022)*
Occupational Analysis	In **Ward No. 01**, the largest share of people is engaged in **business (71%)**, followed by **workers (14%)**. A smaller proportion are involved in **service holding (10%)** and **medical services (5%)**. No participation is recorded in driving, farming, education, or religious roles, indicating limited occupational diversity in the ward.
Transportation Analysis	In **Ward 1**, most people travel **on foot (52.5%)**, followed by **rickshaw (20%)** and **bicycle (16.7%)**. A smaller share use **vans (4.16%)**, while no residents rely on easy bikes or other modes (0%). strong dependence on non-motorized modes. *(Source: Socio-Economic Survey 2025)*

Drainage System	Covered drains: 9.95 km, Uncovered drains: 0.78 km. *(Source: Physical Feature Survey 2025)*
Building Type	Katcha: 61, Pucca: 913, Semi-Pucca: 1,030, Tin Shade: 865. *(Source: Physical Feature Survey 2025)*
Building Floor Distribution	1 floor: 1020; 2 floors: 193; 3 floors: 60; 4 floors: 17; 5 floors: 6; 6 floors: 3, 7 floors: 1. *(Source: Physical Feature Survey 2025)*
Elevation Profile (DEM)	12.37–15.9m: Residential/structural, good drainage. 3.01–12.01 m: Agricultural, seasonal waterlogging risk. *(Source: Physical Feature Survey 2025)*
Land Use Status	Agriculture: 50.66 acres, Residential: 51.90 acres, Education: 0 acres, Administrative: 26.40 acres, Mixed use: 7.36 acres, Waterbody: 0.71 acres, Circulation: 8.08 acres, Commercial: 2.18 acres. *(Source: Physical Feature Survey 2025)*
Utility Service	Formal disposal: 35, Public toilets: 0, Cooking Fuel: Cylinder gas *(Source: Physical Feature Survey 2025)*

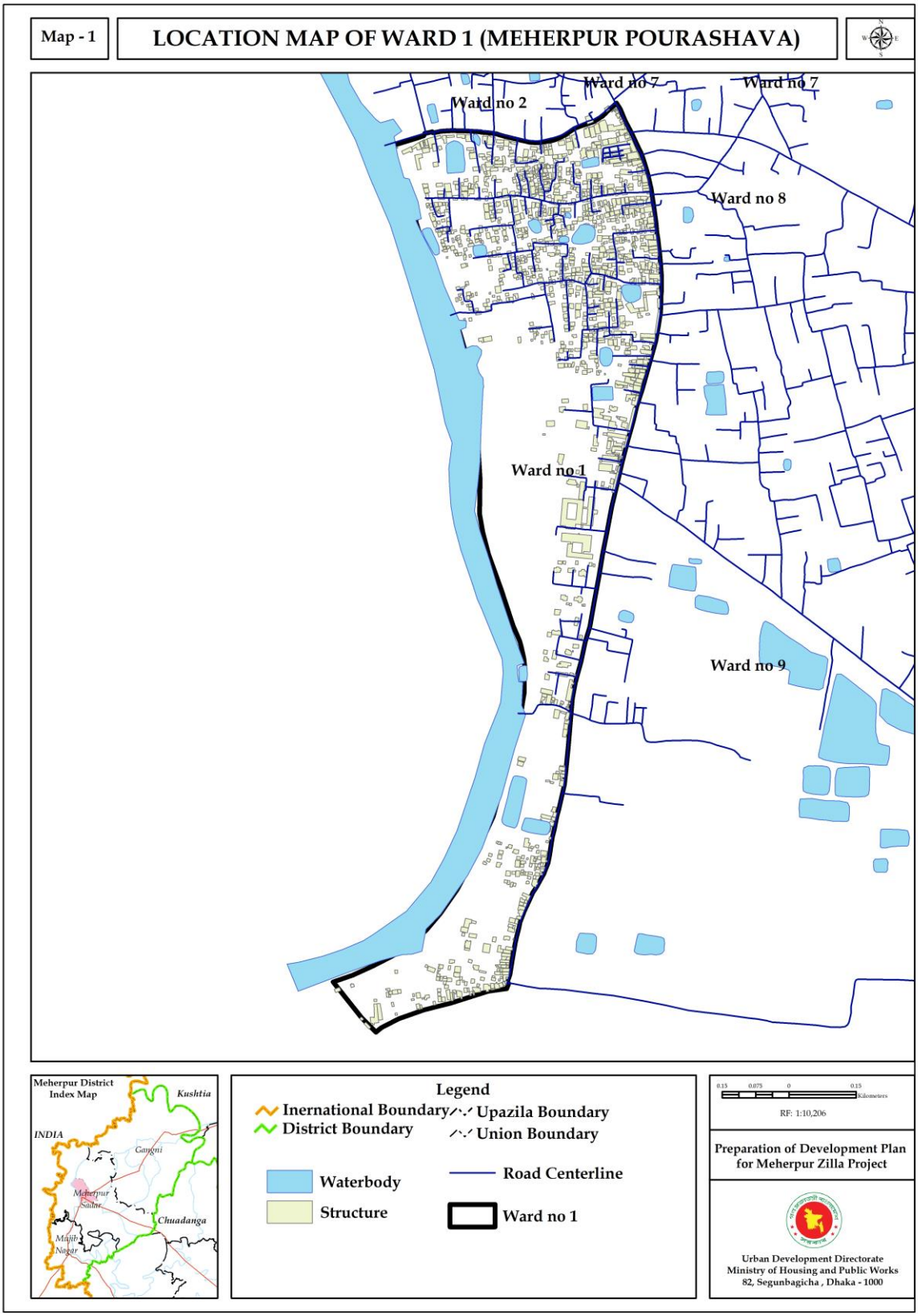


Figure 1: Ward Map of Meherpur Municipality

Emotion Data Analysis

Zone Name	Distance Range (m)	Key Characteristics & Dominant Emotions
Functional Emotion Zone	500–1000	Core area; active commercial, institutional spaces, mixed land use. *Emotions: Love, Happiness*
City Soul Zone	1000–1500	Emotional core; near schools, markets, community hubs; high density & vibrant social activity. *Emotions: Love, Happiness, Sadness*
Emotional Fade Zone	1500–2000	Suburban/isolated; low density; urban–rural fringe atmosphere. *Emotions: Sadness, Anger*
Revival Zone	2000–3000	Emerging, underdeveloped; agricultural/orchard land; future growth potential. *Emotions: Sadness, Fear (potential)*

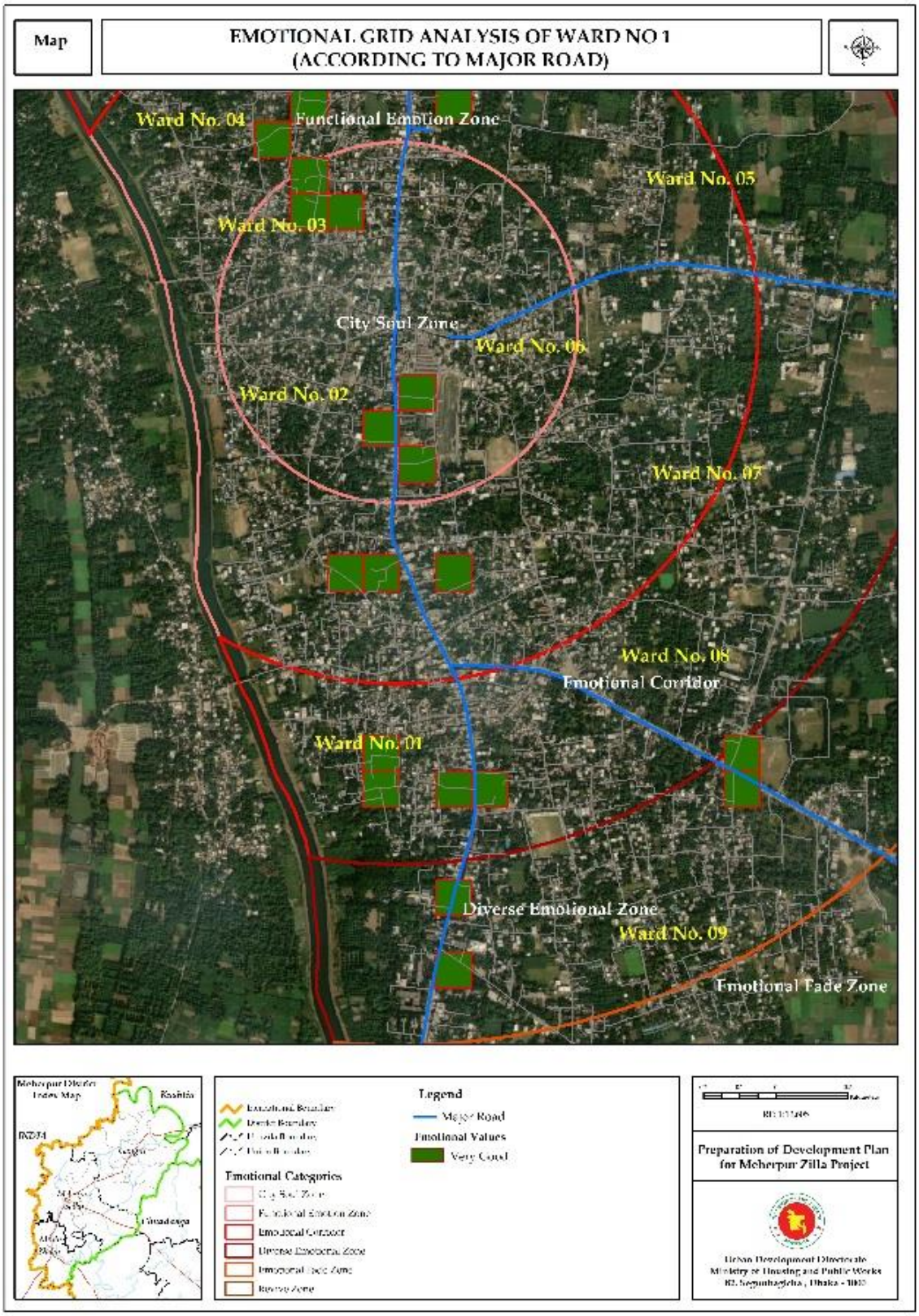


Figure 2: Emotional Distribution Analysis of Ward 8

Urban Void Identification:

The emotional analysis of Ward 1 shows that while the central residential and commercial zones generate strong positive emotions, peripheral agricultural belts and low-density areas remain underutilized as Emotional Gap Areas. These neglected spaces lack social or recreational functions but hold potential for Urban Void Development through small parks, playfields, or community gathering points. Such interventions would reduce isolation, enhance social interaction, and balance the ward's agricultural and residential character, improving overall livability and resilience. (Figure 3)

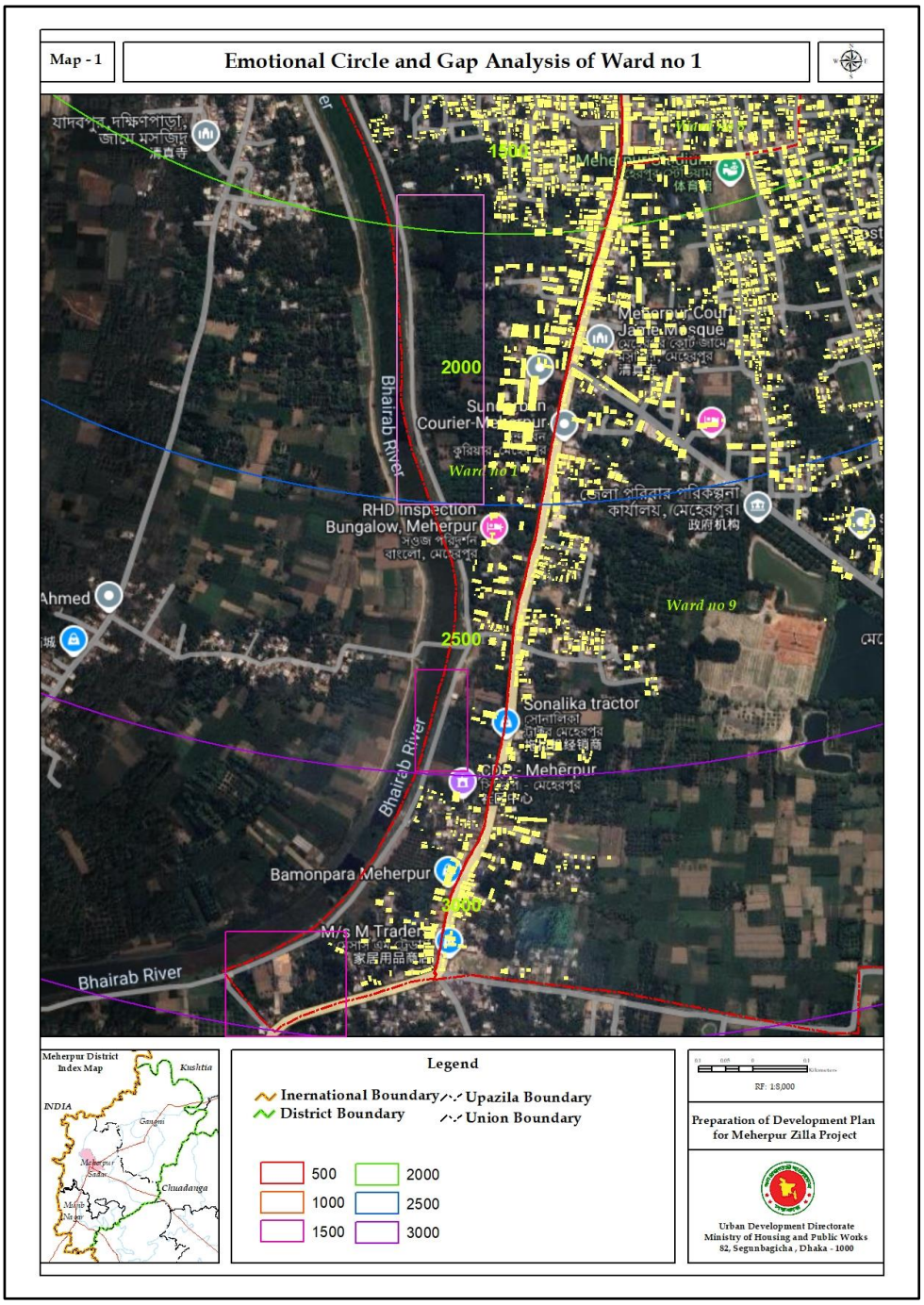
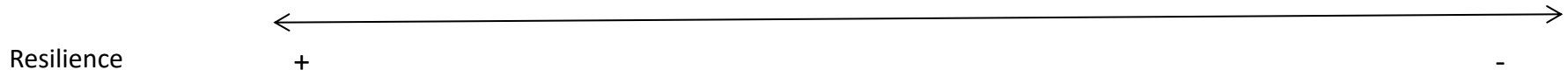


Figure 3: Emotional Circle and Gap Area Analysis of Ward 7

Issue Identification:

Source	Issues Identified
PRA	○ Improvement of the drainage system ○ Supply of pure drinking water ○ Arrangement of playgrounds ○ Road construction ○ Improvement of waste management ○ River conservation/maintenance ○ Establishment of libraries
Emotional Analysis	○ poor walkability and connectivity. ○ Centralized dependency on distant formal institutions (Upazila/Zila Parishad, Pourashava, Schools, Bus Stand).
Socio-Economic Data	○ Poor road conditions in many areas ○ Inadequate and distant drains ○ Irregular waste collection, lack of dustbins ○ Small or insufficient markets ○ Limited and poor-quality public services (education, health, water, electricity)
Newspaper	○ Daily laborers gather from surrounding villages, creating congestion. ○ Random rickshaws and easy bike parking cause traffic jams. ○ Noise pollution from vehicles and crowding.

Adaptive Cycle Phase Analysis:



Adaptive Cycle Phase	Release (Ω)	Reorganization (α)	Growth (r)	Conservation (K)
Social System	One population overwhelms all others, which disappear, or a revolt occurs, breaking the homogeneity of the space.	Heterogeneous populations mixing at the individual level; and absence of barriers. Mainstreaming (residents and explorers) and marginal (drug traders and sex workers) are present.	Selected populations begin to grow; the mainstream populations may begin to overtake marginal populations. Space encourages inclusion.	One population may begin to dominate; Population in the area becomes homogeneous. Segregation occurs are barriers, both physical and implied, rise.
Economic System	Small permutation in customer or market yields collapse	Small, opportunistic, and temporary business emerges.	Entrepreneurs create highly flexible businesses. Imported or local response to local needs.	Large-scale economic entities emerge emphasing "one size fits all" Efficiency is paramount: customization disappears and the system is inflexible.
Environmental System:	Out of bounds event overwhelms engineered and separated system.	Spontaneous and visible natural processes in the site.	Designed, visible Reinforcing the connection to other systems.	Engineered, hidden Separates the bio-system from others Inflexible.

Results	**Unmanaged Sprawl:** The primary issue is the unplanned and rapid conversion of land from its current use, such as agriculture, to urban development. This leads to the loss of valuable farmland and natural spaces. **Vulnerability:** Areas in this phase are highly vulnerable to uncontrolled change, which can overwhelm existing infrastructure and services.	**Lack of Infrastructure:** Areas begin to reorganize, the public infrastructure (roads, water, sewage) may not keep pace with the development. **Ad-hoc Growth:** Without a clear plan, the reorganization can lead to scattered and uncoordinated development, making it difficult to provide efficient public services in the future.	**Congestion & Overburdened Infrastructure:** As the population and economic activity increase, the existing infrastructure can become overstretched, leading to traffic congestion, strain on the water supply, and inadequate sanitation. **Environmental Degradation:** Rapid development can lead to the loss of urban green spaces and a decline in air and water quality.	**Stagnation:** The strong emphasis on stability can lead to stagnation, preventing necessary upgrades to infrastructure and amenities. **Rigidity:** A rigid system of conservation can prevent the area from adapting to new social or economic needs, potentially hindering long-term sustainability. **Resistance to Change:** The population in this phase may resist new development or changes, which can slow down progress and prevent the area from evolving.

- Source: Anderson, 2011
- Source: Marcus, L., & Colding, J. (2023). Placing Urban Renewal in the Context of the Resilience Adaptive Cycle. Land. https://doi.org/10.3390/land13 010008.
- Source: Peng, H., Lou, H., Liu, Y., He, Q., Zhang, M., & Yang, Y. (2025). Spatial and Temporal Evolution Assessment of Landscape Ecological Resilience Based on Adaptive Cycling in Changsha Zhuzhou–Xiangtan Urban Agglomeration, China. Land. https://doi.org/10.3390/land14040 709.
- Source: Wang, Z., Lin, L., Zhang, B., Xu, H., Xue, J., Fu, Y., Zeng, Y., & Li, F. (2023). Sustainable urban development based on an adaptive cycle model: A coupled social and ecological land use development model. Ecological Indicators. https://doi.org/10.1016/j.ecolind.20 23.110666.
- Source: Marcus, L., & Colding, J. (2023). Placing Urban Renewal in the Context of the Resilience Adaptive Cycle. Land. https://doi.org/10.3390/land130 10008.

Urban Resilience Analysis for ward 07:

Ward No. 1 is currently in the Reorganization (α) phase, reflected in its mixed and transitional character. The housing pattern combines katcha (2.9%), semi-pucca (49.4%), tin shade (41.4%), and pucca (43.8%), showing an unstructured built environment. Informal business dominates about 71% of occupations, while non-motorized transport accounts for 93.36%, both indicating an opportunistic yet vulnerable economic base. Land use is scattered with agriculture (50.66 acres, 32%) and residential (51.90 acres, 33%) side by side, alongside smaller portions for mixed (7.36 acres, 5%), commercial (2.18 acres, 1%), and administrative (26.40 acres, 16%) functions—signaling an unplanned shift from rural to semi-urban. The population is mostly Muslim (95%) with Hindu (4.8%) and Christian (0.3%) minorities, reflecting heterogeneity, while the absence of educational land and issues like youth drug abuse expose social vulnerability. Altogether, the ward portrays a community reorganizing itself—open to opportunities but still struggling with ad-hoc growth, weak services, and fragile institutions, firmly placing it in the reorganization phase of the adaptive cycle.

Adaptive Cycle Phase	Problem arises in ward 07	Planning Intervention	Implementation Authority
Reorganization (α)	**Lack of Infrastructure:** **1.** Drainage system (improvement / inadequate & distant drains) (PRA, Socio-Economic Data) **2.** Supply of pure drinking water (PRA) **3.** Playground arrangement (PRA) **4.** Roads (construction / poor condition in many areas) (PRA, Socio-Economic Data) **5.** Waste management (improvement / irregular collection, lack of dustbins) (PRA, Socio-Economic Data) **6.** River conservation/maintenance (PRA) **7.** Library establishment (PRA) **8.** Walkability and connectivity (poor condition) (Emotional Analysis) **9.** Centralized dependency on distant institutions (Upazila/Zila Parishad,	1. Agriculture area Protection (≈35%, 51 ac), need to preserve the. The current amount is not enough, but the ward is an administrative office, so increasing Agricultural land is not possible. (*Source: FAO Urban Agriculture Guidelines*) 2. Residential Area protection (≈35%, 52 ac), no need to increase. (Source: Adaptive Reorganization Stage – Holling & Gunderson, The standards of UDD for Small Towns of Bangladesh) 3. Mixed Use Area (≈5%, 7-8 ac) needs to increase (Source: Resilience Planning & Informal Economy Integration) 4. Education Institution and Civic Facility (0 - 2 ac) needs to increase, but according to the ward, there is	Open Space and Recreational Place Implemented by LGED (Local Government Engineering Department) in collaboration with the Municipality

	Pourashava, Schools, Bus Stand) (Emotional Analysis) **10.** Markets (small or insufficient) (Socio-Economic Data) **11.** Public services (limited & poor quality in education, health, water, electricity) (Socio-Economic Data) **12.** Congestion from daily laborer gatherings (Newspaper) **13.** Traffic jams from rickshaw/easy bike parking (Newspaper) **14.** Noise pollution from vehicles & crowding (Newspaper) **Ad-hoc Growth:** 1. For the Residential Area, there is a need for Vertical Development with a Green Building. 2. Mixed-use area needs to increase at the Baman Para by 2-3 Acres so the pressure at Hotel Bazar decreases. 3. Open spaces and Recreation areas need to be built up at the Urban Void area of Ward 1 near the riverside of Ghatpara and Baman Para area.	no space for an increase. (*Source: Community Anchor Spaces in Resilient Cities, The standards of UDD for Small Towns of Bangladesh)* **5.** Open Space & Recreation area (0 → 4–8 ac) needs to increase (Source: BIP Standards; Dhaka/BanglaJOL review, The standards of UDD for Small Towns of Bangladesh)	

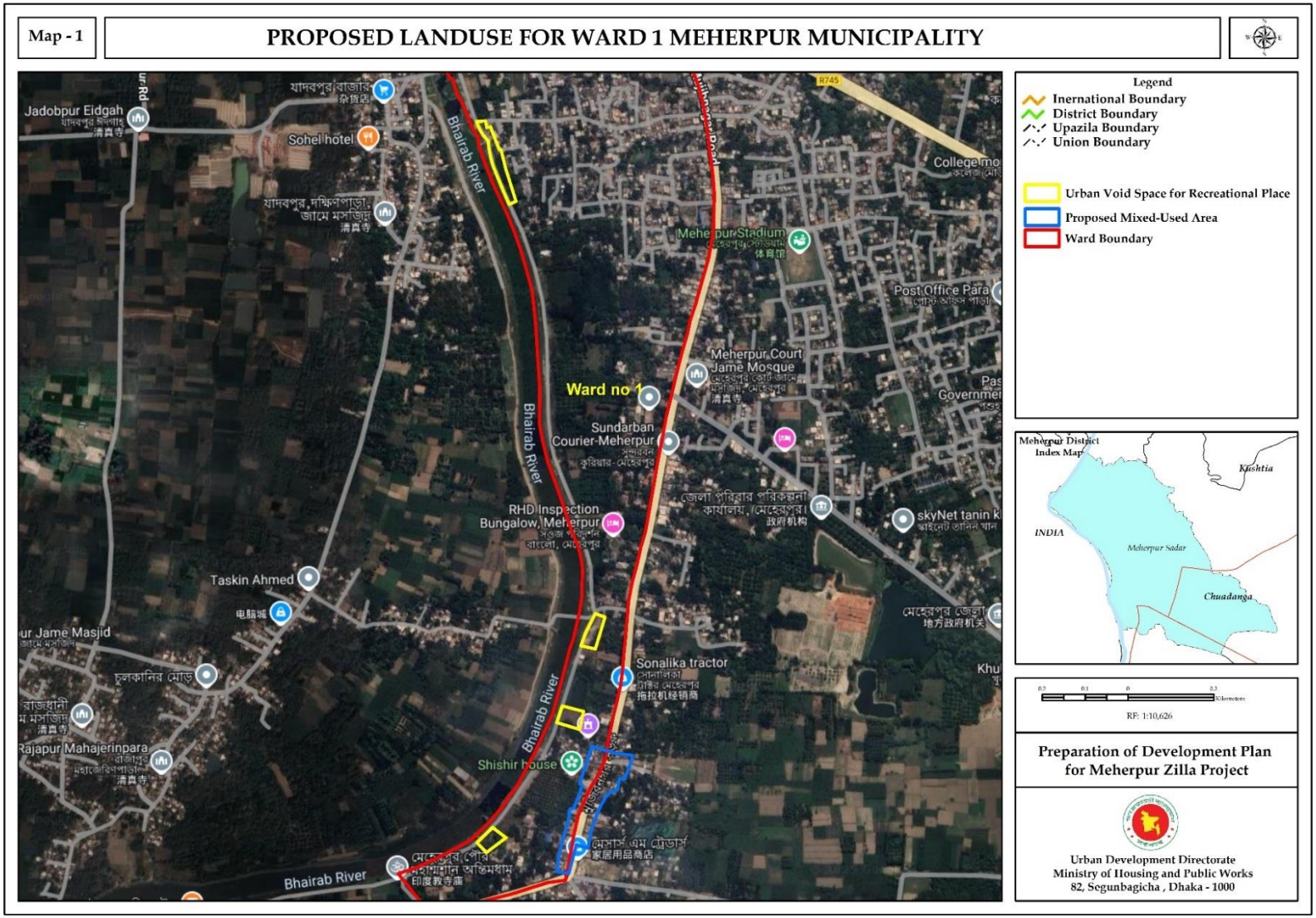


Figure 4: Proposed Land Use for Ward 1