



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-5

Spatial transformation of Agricultural Survey, such as the Identification of single, Double, triple-cropped land etc.

October 2025

Md. Kamrul Hasan
Junior GIS Consultant

Summary of Assignment-5

A. Summary of Assignment-5

This report summarizes Assignment-5 according to the ToR by the Junior GIS Consultant (Individual Consultant) for the “Preparation of Development Plan for Meherpur Zilla "project. The assignment has done by me is “Spatial transformation of Agricultural Survey, such as the Identification of single, Double, triple-cropped land, etc.”. The detailed process is also summarized in the Report. This report presents a detailed analysis of the cropping pattern in Meherpur Zila, including upazila-wise cultivation practices and seasonal crop distribution. It identifies the timing and types of crops grown across Kharif-1, Kharif-2, and Rabi seasons, along with relevant recommendations for improvement. Furthermore, the report examines the impact of drought hotspots on agricultural land during these three seasons and analyzes upazila-wise policy responses in alignment with the national agricultural and drought management guidelines of Bangladesh.

(Md. Kamrul Hasan)
Junior GIS Consultant

Spatial transformation of Agricultural Survey, such as the Identification of single, Double, triple-cropped land, etc.

Cropping Pattern of Meherpur Zila:

Meherpur Zila, situated in the southwestern part of Bangladesh under the Khulna Division, is one of the country's most agriculturally productive regions. The district benefits from fertile alluvial soils, favorable climatic conditions, and a strong irrigation network, which collectively support intensive agricultural practices throughout the year. The overall cropping intensity of Meherpur is about 268%, indicating that most of the cultivable land is utilized for multiple crops annually.

An analysis of the cropping pattern across the three upazilas—Meherpur Sadar, Mujibnagar, and Gangni—shows notable variations in land use intensity:

| Upazila | Single Cropped Area (Ha) | Double Cropped Area (Ha) | Triple Cropped Area (Ha) | Quad Cropped Area (Ha) | Total Cultivated Area (Ha) |
|----------------|--------------------------|--------------------------|--------------------------|------------------------|----------------------------|
| Meherpur Sadar | 1,651.18 | 549.15 | 22,738.57 | 1,293.95 | 26,232.85 |
| Mujibnagar | 1,575.75 | 841.87 | 8,009.35 | 1,197.35 | 11,624.33 |
| Gangni | 0.00 | 893.22 | 25,417.84 | 2,258.42 | 28,569.48 |
| Total (Zila) | 3,226.93 | 2,284.24 | 56,165.76 | 4,749.72 | 66,426.65 |

The data clearly show that triple-cropped areas dominate the agricultural landscape of Meherpur Zila, covering over 56,000 hectares, followed by lands cultivated more than three times a year. Among the upazilas, Gangni has the largest total cultivated area (28,569.48 ha), primarily under triple and quad cropping systems. Meherpur Sadar also exhibits a high intensity of cultivation, with over 22,000 ha of triple-cropped land. Mujibnagar, though smaller in total cultivated area, maintains significant multiple cropping practices supported by irrigation.

Overall, the cropping pattern of Meherpur Zila reflects a highly intensive and diversified agricultural system, with farmers cultivating a range of crops, including rice, wheat, jute, maize, vegetables, and pulses, across different seasons. This intensive use of land underscores the district's agricultural potential but also highlights its vulnerability to water scarcity and seasonal drought, emphasizing the need for sustainable irrigation and water management practices to maintain long-term productivity.



Figure 1: Crop Pattern map of Meherpur Zila

6.1 Upazila-wise Crop Pattern Characteristics

1. Meherpur Sadar

- **Dominant Cropping Pattern:** Triple-cropped area (22,738.57 ha), representing 87% of total cultivated land.
- **Major Crops:** Boro–Aus–Aman rice, jute, vegetables, and corn.
- **Characteristics:**
 - Dominated by Rice–Rice systems (Aman–Boro).
 - High vegetable rotation in Buripota, Kutubpur, and Pirojpur.
 - Intensive cultivation facilitated by high-yielding variety (HYV) rice.
 - Gradual increase in vegetable cultivation in the Rabi season.

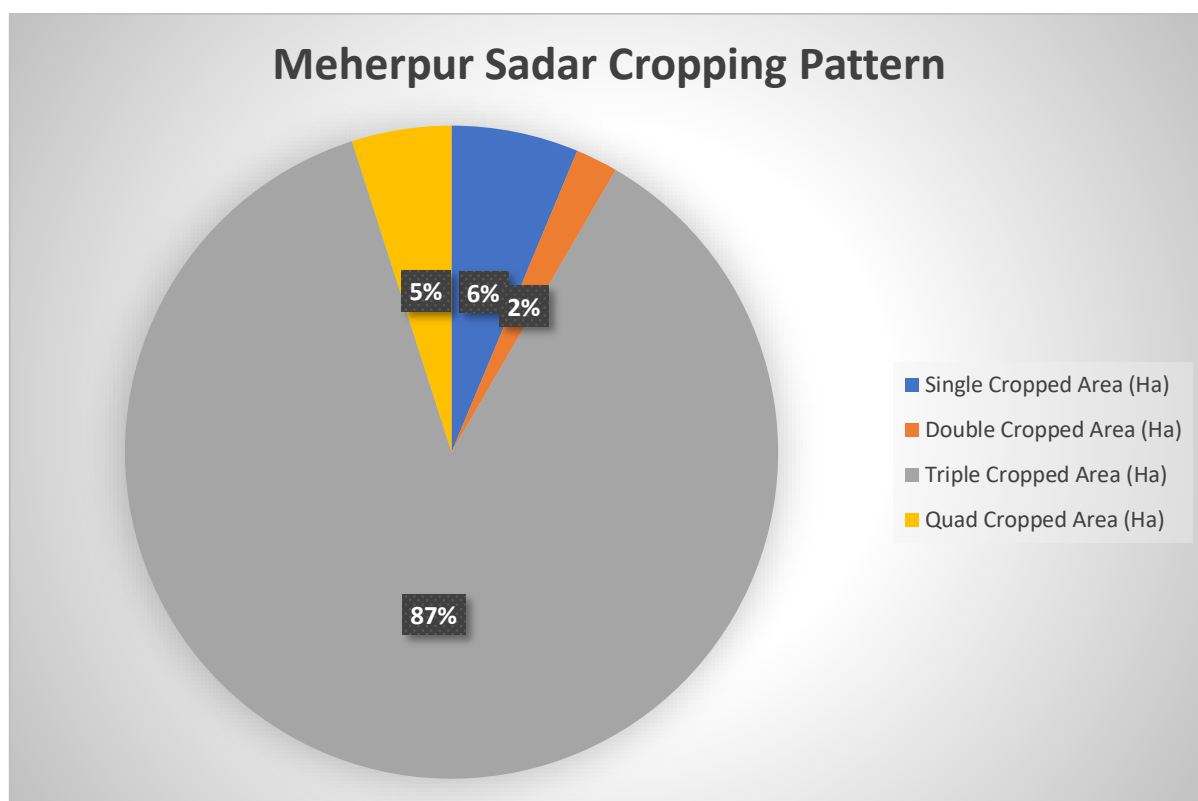


Figure 13: Crop Pattern of Meherpur Sadar

Union Wise Cropping Pattern:

| Union | Crops Grown (Last Year, Season-wise) | No. of Crops per Year |
|---------------------|--|-----------------------|
| Amdah | Paddy–Paddy-vegetables; Mango (Jan–Oct) | 2-4 |
| Amjhupi | Paddy–Vegetable; Paddy–Jute-Vegetable-Vegetable | 4 |
| Baradi | Paddy–Paddy; Paddy–Vegetables–Fruits | 2–3 |
| Buripota | Paddy–Vegetable–Vegetable; Grass (Jan–Dec); Fish; Jute–Vegetable–Paddy | 1–3 |
| Kutubpur | Paddy–Paddy; Jute–Vegetable–Paddy-Banana; Vegetables–Corn; | 1–4 |
| Meherpur Paurashava | Banana; Grass; Paddy–Paddy; Jute–Paddy–Vegetables | 1–3 |
| Pirojpur | Paddy–Paddy; Vegetables–Vegetables; Sugarcane; Fruits | 1–3 |
| Shyampur | Paddy–Paddy; Row crops; Paddy–Paddy; Vegetables | 1–4 |

2. Mujibnagar

- **Dominant Cropping Pattern:** Triple-cropped area (8,009.35 ha), 69% of total cultivated area.
- **Major Crops:** Boro–Aman–Vegetable, Jute–Aman–Pulse, and seasonal fruits.
- **Characteristics:**
 - Balanced distribution between single, double, and triple cropping.
 - Triple cropping evident in Bagoan and Monakhali, integrating jute–vegetable–vegetable sequences.
 - Sugarcane and banana are key long-duration crops.

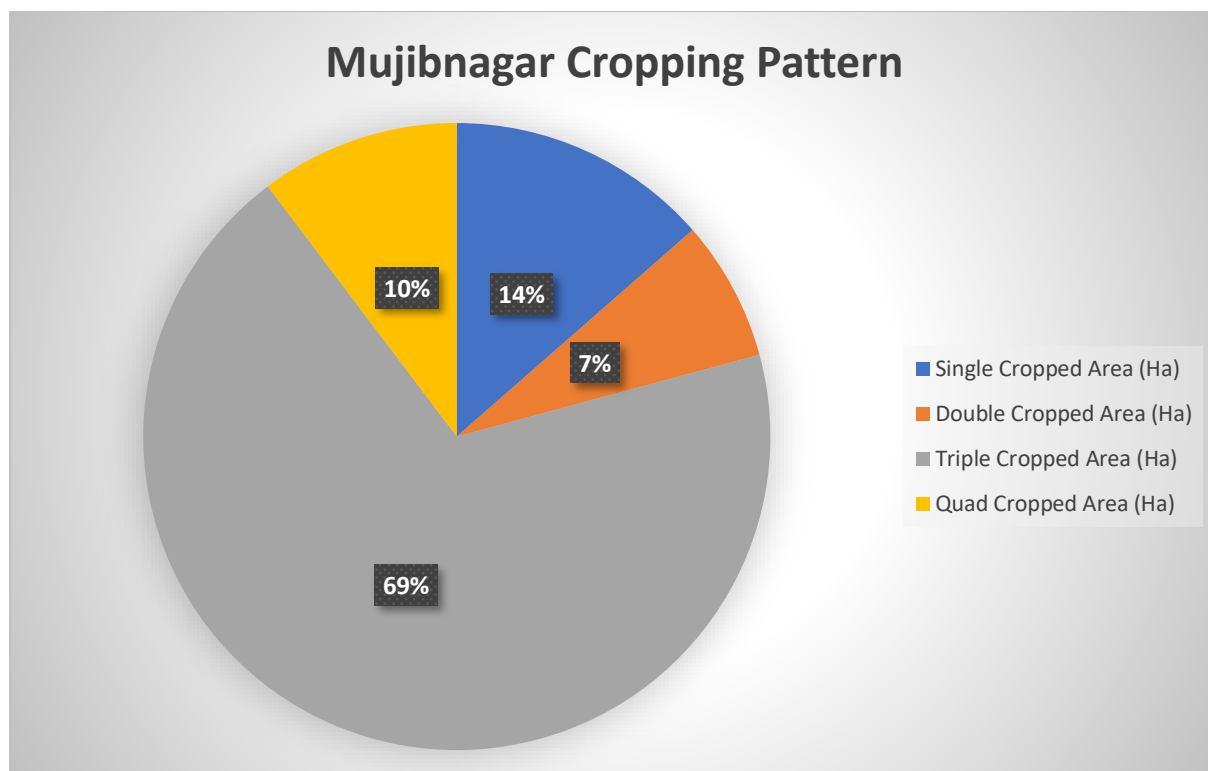


Figure 14: Crop Pattern of Mujibnagar

Union Wise Cropping Pattern:

| Union | Crops Grown (Last Year, Season-wise) | No. of Crops per Year |
|------------|---|-----------------------|
| Bagoan | Jute–Vegetable–Vegetable; Paddy–Paddy; Mango | 1–3 |
| Dariapur | Paddy–Paddy; Row crops | 1–2 |
| Mahajanpur | Paddy–Paddy; Vegetable–Vegetable–Vegetable- Paddy | 2–4 |
| Monakhali | Sugarcane–Paddy- Banana; Vegetable–Vegetable–Vegetable- Paddy | 3–4 |

3. Gangni

- **Dominant Cropping Pattern:** Triple-cropped area (25,417.84 ha), 89% of cultivated land.
- **Major Crops:** Boro–Aus–Aman rice, Jute, wheat, and vegetables.
- **Characteristics:**

- Largest agricultural area in Meherpur zila.
- Triple cropping is highly prevalent in Kathuli, Kazipur, Sholotaka, and Tentulbaria, Gangni, and Raypur.
- Intensive rice-based systems dominate, with inclusion of cash crops (jute and wheat).
- Use of irrigation and short-duration crops allows 4–crop cycles at Shaharbarati union.

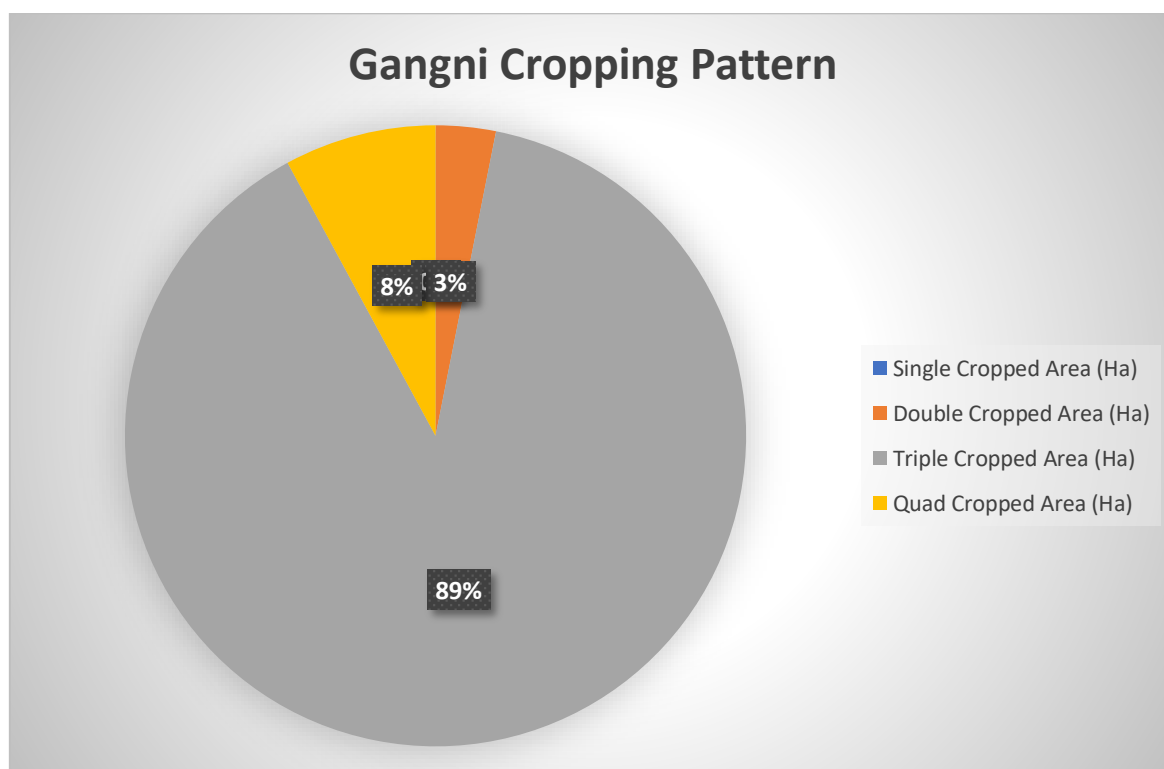


Figure 15: Crop Pattern of Gangni

Union Wise Cropping Pattern:

| Union | Crops Grown (Last Year, Season-wise) | No. of Crops per Year |
|-------------------|--|-----------------------|
| Bamundi | Paddy–Jute–Wheat; Paddy–Paddy | 2–3 |
| Dhankhola | Paddy–Jute; Lemon; Paddy–Paddy | 1–2 |
| Gangni Paurashava | Paddy–Paddy; Paddy–Paddy–Paddy (Continuous Rice) | 2–3 |
| Kathuli | Vegetable–Vegetable–Vegetable; Jute–Paddy–Vegetable; Mango | 1–3 |

| Union | Crops Grown (Last Year, Season-wise) | No. of Crops per Year |
|-------------|--|-----------------------|
| Kazipur | Paddy–Jute–Paddy; Paddy–Paddy | 2–3 |
| Matmura | Paddy–Paddy; Grass; Ground crops | 1–2 |
| Raypur | Pepper–Paddy; Paddy–Jute | 2 |
| Shaharbati | Paddy–Paddy–Jute; Paddy–Jute–Vegetable–Vegetable | 3–4 |
| Sholotaka | Fisheries; Pepper–Paddy; Pepper–Wheat–Jute | 1–3 |
| Tentulbaria | Wheat–Watermelon–Cauliflower; Paddy–Paddy–Vegetables | 3 |

6.2 Comparative Overview:

| Parameter | Meherpur Sadar | Mujibnagar | Gangni |
|--------------------------|--------------------------|--------------------------|---------------------|
| Dominant Cropping System | Rice–Rice–Vegetable | Jute–Vegetable–Vegetable | Rice–Jute–Vegetable |
| Cropping Intensity | Very High | Moderate | High |
| Crop Diversity | High | Moderate | Very High |
| Perennial Crops | Banana, Mango, Sugarcane | Mango, Banana | Mango, Lemon |
| Irrigation Dependence | High | Medium | High |

6.3 Key Findings

- **Triple cropping** is the major pattern across all upazilas, supported by irrigation and HYV seeds.
- **Rice** remains the principal crop, followed by **jute**, **vegetables**, and **horticultural crops**.
- **Meherpur Sadar** and **Gangni** are more intensive, while **Mujibnagar** is relatively balanced.
- **Cash crops** (jute, pepper, sugarcane) and **horticultural crops** (mango, banana) diversify income.
- **Sustainability issues** include soil nutrient depletion, water scarcity, and reduced tree vegetation.

6.4 Recommendations:

- **Soil Fertility Management:** Promote crop rotation with legumes (lentil, mung bean) to restore soil nutrients.

- **Crop Diversification:** Introduce short-duration cash crops (vegetables, pulses, mustard) between rice seasons.
- **Organic Practices:** Increase use of compost and biofertilizers to reduce chemical dependency.
- **Market Linkage:** Develop cold storage and collection centers for vegetables and fruits to reduce post-harvest losses.
- **Farmer Training:** Conduct training on organic farming, integrated pest management (IPM), and compost production.
- **Infrastructure Development:** Build rural roads and collection hubs to improve access to regional markets.
- **Agroforestry Promotion:** Combine tree planting with crop fields to improve soil structure and prevent erosion.
- **Precision Agriculture:** Use modern tools (soil testing, irrigation scheduling) to optimize inputs.
- **Value Addition:** Develop small-scale agro-processing units (dry chili, oilseed crushing, vegetable drying) to increase farm income.

Analysis of the Impact of Drought on Seasonal Crop:

Drought is one of the most significant climatic hazards affecting agricultural productivity, particularly in regions that rely heavily on rainfall for crop cultivation. Meherpur Zila, located in the southwestern part of Bangladesh, is primarily an agrarian district where a large portion of the population depends on seasonal crop production for their livelihood. The district experiences three major cropping seasons—Kharif-I, Kharif-II, and Rabi—each of which is influenced by varying rainfall patterns and climatic conditions. In recent years, irregular rainfall distribution, extended dry spells, and increasing temperature trends have intensified the risk of agricultural drought, leading to reduced soil moisture, crop stress, and yield losses.

This study, “**Analysis of the Impact of Drought on Seasonal Crops of Meherpur Zila,**” aims to assess how drought conditions affect the spatial and temporal distribution of agricultural productivity across different seasons. Using remote sensing and GIS-based techniques along with field-level data, the analysis identifies drought-prone areas, evaluates drought severity, and examines its impact on major crops cultivated in each season. The findings of this study are expected to support policymakers, agricultural planners, and local farmers in developing effective drought mitigation strategies and ensuring sustainable crop production in Meherpur Zila.

Pre-Monsoon Season:

During the pre-monsoon season, Meherpur Zila experienced notable drought conditions that significantly affected agricultural productivity. Based on the spatial drought hotspot analysis, a total of **102.54 sq. km** area was identified as being under drought stress.

| Cropping System | Area Affected (sq. km) | Remarks |
|---------------------|------------------------|---|
| Single-Cropped Land | 20.09 | Moderately affected; rainfall-dependent crops |
| Double-Cropped Land | 5.34 | Limited irrigation; moderate impact |
| Triple-Cropped Land | 77.11 | Most affected: high cropping intensity |

The predominance of **triple-cropped areas** within the drought hotspot indicates that **intensively cultivated lands** were most vulnerable during the pre-monsoon period due to high water demand and limited rainfall.

Upazila-wise Drought Impact Assessment

| Upazila | Cropping System Affected | Location(s) | Approx. % of Land Affected |
|-----------------------|---|---|----------------------------|
| Mujibnagar | Single-cropped (Vegetables) | Dariapur | 100% |
| | Double-cropped (Paddy–Vegetable) | Bagoan | 20% |
| | Triple-cropped (Jute/Paddy–Paddy–Vegetable) | Bagoan | 20% |
| Meherpur Sadar | Single-cropped (Paddy/Betel Leaf) | Buripota, Kutubpur, Shyampur, Amjhupi | 40% |
| | Double-cropped (Jute–Aman/Wheat–Banana/Vegetable) | Buripota, Kutubpur, Shyampur, Amjhupi | 40% |
| | Triple-cropped (Paddy–Wheat–Paddy) | Buripota, Kutubpur, Shyampur, Amjhupi, Baradi, Meherpur Sadar | 30% |
| Gangni | Triple-cropped (Paddy – Tobacco/Wheat - Vegetables) | Dhankhola, Raypur, Gangni | 10% |

The pre-monsoon drought analysis shows that **areas practicing multiple cropping systems—especially triple-cropped lands—were the most affected**, reflecting high water demand and dependency on timely rainfall. To reduce these impacts, **localized drought adaptation strategies** are essential, including improved irrigation management, the use of **drought-tolerant crop varieties**, and **soil moisture conservation techniques**. Implementing these measures can strengthen resilience, stabilize yields, and support sustainable agriculture in Meherpur Zila during the pre-monsoon period.

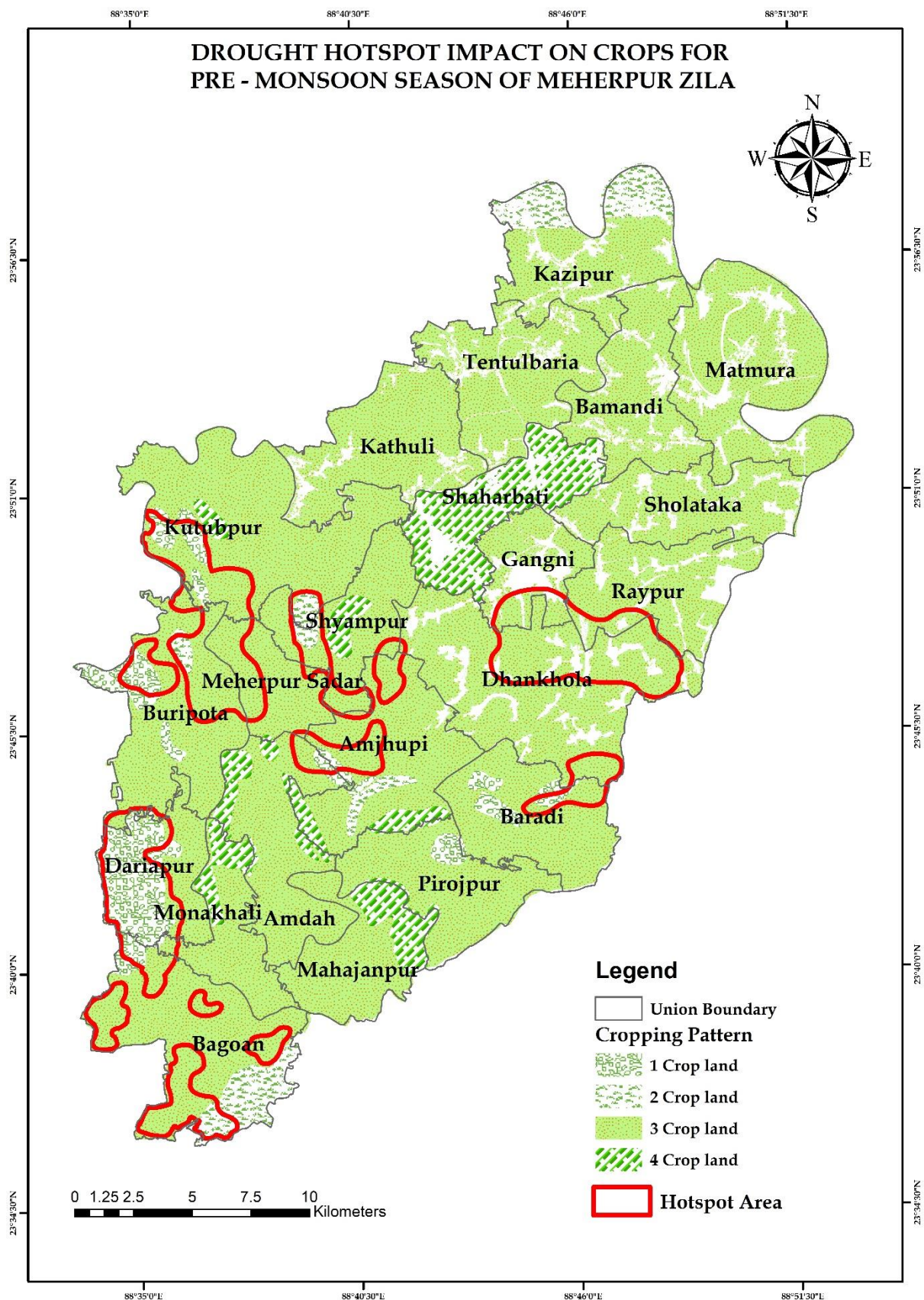


Figure 22: Drought Hotspot Impact on Crops for the Pre-Monsoon season of Meherpur Zila

Monsoon Season:

During the monsoon season, drought conditions in Meherpur Zila affected large areas of agricultural land, particularly those under multiple cropping systems. As shown in **Figure 8**, the drought hotspot analysis identified a total of **160.52 sq. km** of affected land across the district.

| Cropping System | Area Affected (sq. km) | Remarks |
|---------------------|------------------------|---|
| Double-Cropped Land | 5.103 | Moderate impact |
| Triple-Cropped Land | 141.65 | Most affected: high cropping intensity |
| Quad-Cropped Land | 13.77 | Highly intensive lands under drought stress |

The predominance of triple- and quad-cropped lands within the affected zones indicates that **intensively cultivated areas were highly vulnerable** to monsoon season droughts.

Upazila-wise Drought Impact Assessment

| Upazila | Cropping System Affected | Location(s) | Approx. % of Land Affected |
|-----------------------|---|---|----------------------------|
| Mujibnagar | Triple & Quad-cropped (Jute/Paddy–Paddy–Vegetable–Paddy) | Monakhali, Mahajanpur | 30% |
| Meherpur Sadar | Triple-cropped (Paddy–Wheat–Paddy) | Amdah, Pirojpur, Buripota, Sadar, Kutubpur, Shyampur | 20% |
| | Quad-cropped (Paddy – Wheat – Vegetables - Paddy) | Amdah, | 30% |
| Gangni | Double-cropped (Paddy -Vegetable) | Kazipur | 50% |
| | Triple-cropped (Paddy – Tobacco/Wheat - Vegetables) | Matmura, Kazipur, Tentulbaria, Bamandi, Gangni, Raypur, Dhankhola | 40% |
| | Quad-cropped (Paddy – Tobacco/Wheat – Vegetables - Paddy) | Shaharbati | 20% |

The monsoon season drought analysis indicates that **high-intensity cropping zones—especially triple- and quad-cropped lands—were the most affected** in Meherpur Zila. To mitigate these impacts and sustain crop productivity, **efficient irrigation management, crop diversification, and the adoption of drought-tolerant varieties** are crucial. Strengthening these practices will enhance the district’s resilience against future monsoon droughts and help secure farmers’ livelihoods.

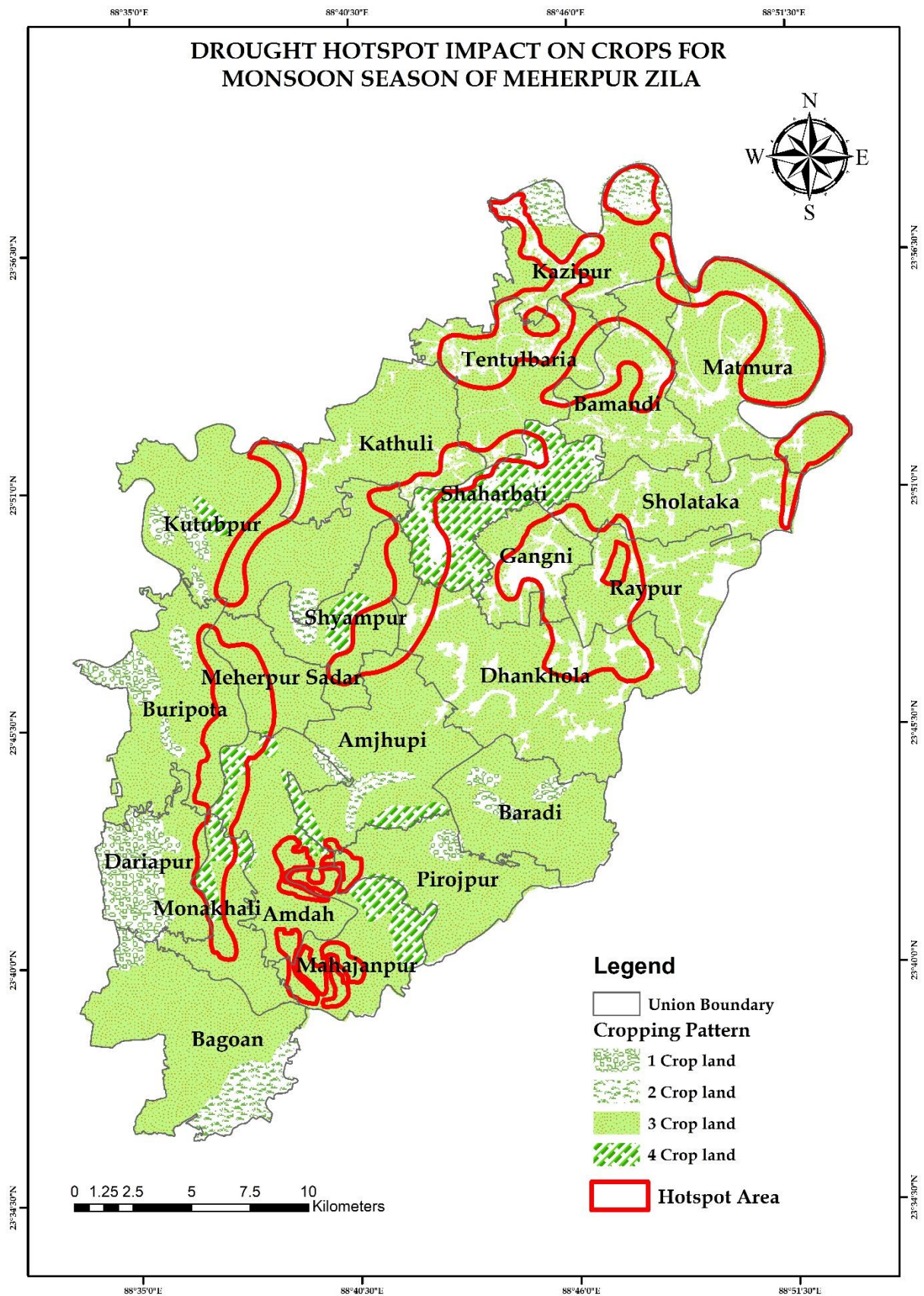


Figure 23: Drought Hotspot Impact on Crops for the Monsoon season of Meherpur Zila

Dry / Winter Season:

During the dry or winter season (Rabi period), Meherpur Zila experienced significant drought conditions that adversely affected agricultural production. The drought hotspot analysis (Figure 9) reveals that a total of **87.42 sq. km** of land was affected across various cropping systems, as shown below:

| Cropping System | Area Affected (sq. km) | Remarks |
|---------------------|------------------------|-------------------------------------|
| Single-Cropped Land | 0.285 | Least affected |
| Double-Cropped Land | 4.70 | Moderate impact |
| Triple-Cropped Land | 75.53 | Most affected, highly intensive |
| Quad-Cropped Land | 6.91 | Highly intensive zones under stress |

The predominance of drought impact on **triple-cropped areas** indicates that zones with **high cropping intensity** are particularly vulnerable to **water scarcity** during the dry season, mainly due to high cumulative water demands.

Upazila-wise Drought Impact Assessment

| Upazila | Cropping System Affected | Location(s) | Approx. % of Land Affected |
|-----------------------|---|--|----------------------------|
| Mujibnagar | Quad-cropped (Jute/Paddy–Paddy–Vegetable–Paddy) | Monakhali, Mohajanpur | 50% |
| | Triple-cropped (Jute/Paddy–Paddy–Vegetable) | Mahajanpur, Monakhali, Dariapur | 40% |
| Meherpur Sadar | Triple-cropped (Paddy–Wheat–Paddy) | Pirojpur, Baradi, Amdah, Buripota, Kutubpur, Meherpur Sadar, Amjhupi | 30% |
| | Quad-cropped (Paddy – Wheat – Vegetables - Paddy) | Amdah | 20% |
| Gangni | Double-cropped (Paddy - Vegetable) | Kazipur | 40% |
| | Triple-cropped (Paddy – Tobacco/Wheat - Vegetables) | Kazipur, Baradi, Matmura, Dhankhola | 10% |
| | Quad-cropped (Paddy – Tobacco/Wheat – Vegetables - Paddy) | Shaharbat | 10% |

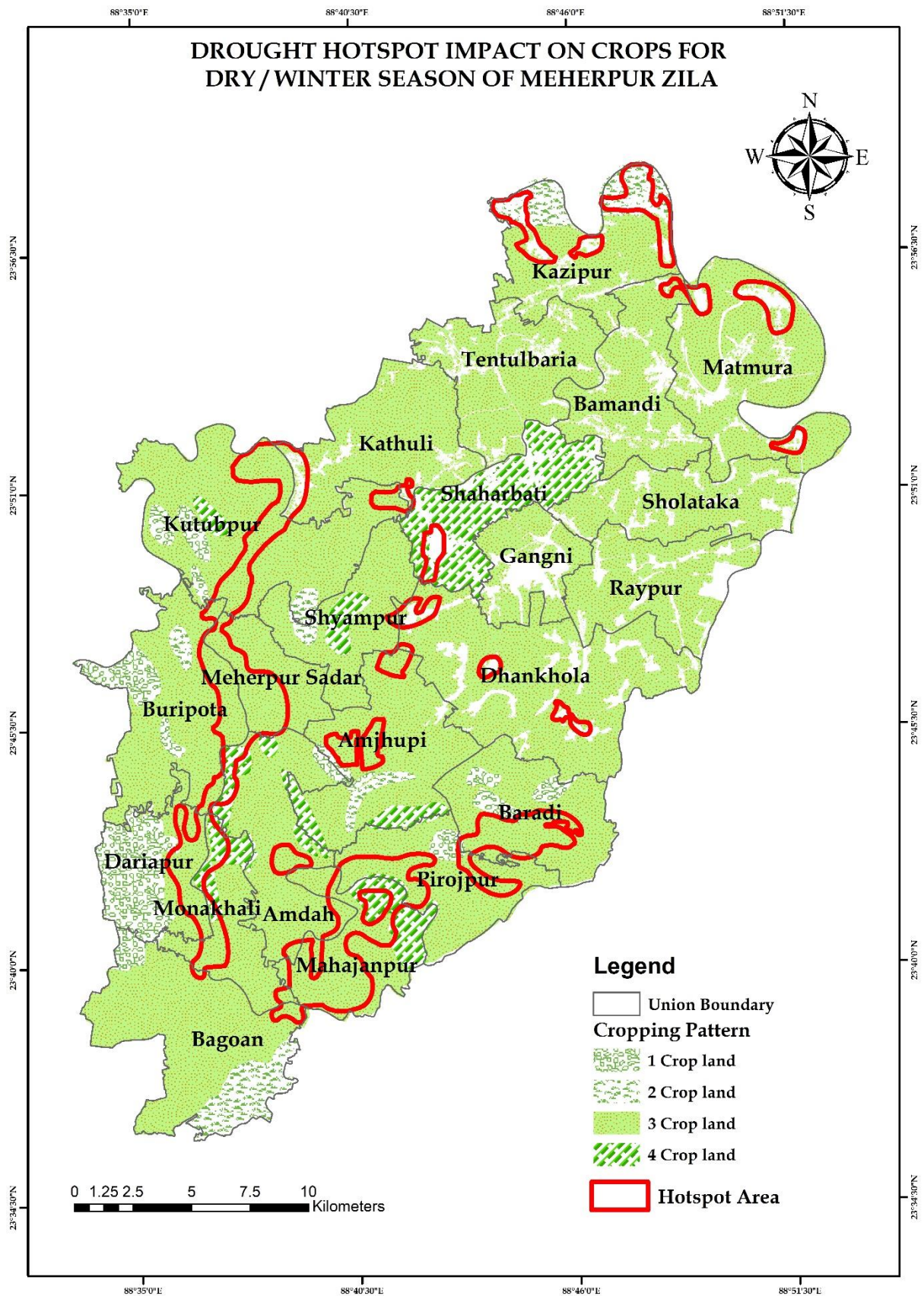


Figure 24: Drought Hotspot Impact on Crops for the Dry / Winter season of Meherpur Zila

The analysis shows that high-intensity cropping areas, especially triple- and quad-cropped lands, are most vulnerable to drought during the Rabi season in Meherpur Zila. To reduce this risk and sustain productivity, efficient irrigation, drought-tolerant crop varieties, soil moisture conservation, and crop planning based on water availability are essential. These measures can enhance resilience and protect farmers' livelihoods in drought-prone areas.

8. Agricultural Policy and Guidelines for Meherpur Zila

The agricultural policy and guidelines for Meherpur Zila combine both sustainable cropping strategies and drought-responsive measures. These are formulated based on the district's intensive farming practices—where the cropping intensity reaches up to 268%—and the identified vulnerabilities to soil fertility decline, groundwater stress, and seasonal droughts. The integrated approach ensures sustainable productivity, resilience, and profitability across all three upazilas: Meherpur Sadar, Mujibnagar, and Gangni. *[NAP 2018; CSAIP 2019]*

8.1 Upazila-Specific Agricultural Policies

Meherpur Sadar Upazila (Rice–Rice–Vegetable System)

Meherpur Sadar has a very high cropping intensity, with about 87% of cultivated land under triple cropping. Policies focus on managing irrigation dependence and sustaining soil fertility in high-rotation vegetable areas.

- **Soil Fertility Management:** Promote crop rotation with legumes (in Amjhupi and the other four-crop areas) to replenish soil nutrients. *[NAP 2018]*
- **Market Linkage:** Establish cold storage and collection centers in Buripota, Kutubpur, and Pirojpur to reduce post-harvest losses. *[NAP 2018; NAMP 2020]*
- **Agroforestry Promotion:** In Amdah Union, integrate mango orchards with crop lands to enhance soil stability and reduce erosion. *[NAP 2018]*
- **Crop Diversification:** Introduce short-duration crops (pulses, mustard) in Shyampur and other paddy-dominated areas to break continuous rice cycles. *[NAP 2018; CSAIP 2019]*
- **Drought Focus:**
 - **Pre-Monsoon:** Improve groundwater recharge and efficient irrigation in Kutubpur, Buripota, and Amjhupi. *[CSAIP 2019]*
 - **Monsoon:** Prioritize irrigation efficiency for triple- and quad-cropped lands in Amdah and Pirojpur. *[NAMP 2020]*
 - **Dry Season:** Promote soil moisture conservation and groundwater management to sustain Rabi crops. *[CSAIP 2019]*

Mujibnagar Upazila (Jute–Vegetable–Vegetable System)

Mujibnagar shows moderate cropping intensity and requires balancing its long-duration crops—especially sugarcane and banana—with short-term vegetables.

- **Organic Practices:** Encourage compost and biofertilizer use in Bagoan and Monakhali to maintain soil health. *[NAP 2018]*
- **Agroforestry Promotion:** Integrate tree planting with sugarcane and banana cultivation to improve microclimates and control erosion. *[NAP 2018; CSAIP 2019]*
- **Soil Fertility Restoration:** Introduce legume-based rotations in Mahajanpur to mitigate soil exhaustion from intensive vegetable production. *[NAP 2018]*
- **Crop Diversification:** Promote mustard and pulses in Dariapur to safely increase cropping

intensity. *[NAP 2018]*

- Drought Focus:
 - o Pre-Monsoon: Adopt drought-tolerant crop varieties and soil moisture retention practices in Dariapur and Bagoan. *[CSAIP 2019]*
 - o Monsoon: Strengthen irrigation management and promote diversified cropping in Mohajanpur and Monakhali. *[NAMP 2020]*
 - o Dry Season: Implement efficient irrigation and drought-tolerant crops in Monakhali, Mohajanpur, and Dariapur, where groundwater dependency is high. *[CSAIP 2019]*

Gangni Upazila (Rice–Jute–Vegetable System)

Gangni has the largest agricultural area in the Zila, with nearly 89% of land under triple cropping. Complex crop rotations and high-value cash crops such as jute, wheat, and pepper characterize it.

- Precision Agriculture: Apply soil testing, irrigation scheduling, and precision tools in Kathuli, Tentulbaria, Shaharbati, and Kazipur to improve efficiency. *[NAMP 2020]*
- Infrastructure Development: Build rural collection hubs and improve transport links in Sholotaka and other cash-crop-producing unions. *[NAP 2018; NAMP 2020]*
- Crop Diversification: Introduce legumes or mustard in rice-intensive areas like Bamundi and Kazipur to improve soil health. *[NAP 2018]*
- Value Addition: Support small-scale agro-processing (dry chili, oilseed crushing) for jute, wheat, and lemon (Dhankhola) to raise farm income. *[NAMP 2020]*
- Drought Focus:
 - o Pre-Monsoon: Implement localized irrigation and drought adaptation in Dhankhola and Raypur. *[CSAIP 2019]*
 - o Monsoon: Establish rainwater harvesting and soil conservation systems in Kazipur, Tentulbaria, and Shaharbati. *[CSAIP 2019]*
 - o Dry Season: Promote crop diversification and efficient irrigation systems to address seasonal water scarcity. *[NAMP 2020]*

8.2 Seasonal Drought Policy Integration

| Season | Major Hotspot Upazilas | Key Strategies |
|------------------------|----------------------------|--|
| Pre-Monsoon (Kharif-1) | Meherpur Sadar, Mujibnagar | Efficient irrigation management, groundwater recharge, and use of drought-tolerant varieties. <i>[CSAIP 2019]</i> |
| Monsoon (Kharif-2) | Gangni, Meherpur Sadar | Integrated water resource management, rainwater harvesting, soil conservation, and crop diversification. <i>[NAP 2018; CSAIP 2019]</i> |
| Dry/Winter (Rabi) | Meherpur Sadar, Mujibnagar | Groundwater management, soil moisture conservation, and efficient irrigation technologies to sustain Rabi crops. <i>[NAMP 2020]</i> |

8.3 Integrated Policy Priorities for the Zila

1. Sustainable Soil and Water Management: Strengthen soil testing, promote organic practices, and ensure efficient irrigation through modern technologies. *[NAP 2018; NAMP 2020]*
2. Crop Diversification and Resilience: Shift from rice-dominated systems to mixed rotations with pulses, oilseeds, and vegetables. *[NAP 2018; CSAIP 2019]*
3. Market and Infrastructure Support: Expand cold storage, rural connectivity, and value-added agro-processing facilities. *[NAP 2018; NAMP 2020]*
4. Climate-Resilient Agriculture: Promote drought-tolerant varieties, adopt water-saving technologies, and enhance farmer training on climate-smart practices. *[CSAIP 2019]*
5. Localized Implementation: Tailor interventions at the union level to reflect cropping patterns, drought vulnerability, and resource availability. *[NAP 2018]*

This integrated framework for agricultural policy and guidelines combines sustainable cropping system management with drought adaptation strategies, ensuring that Meherpur Zila's intensive agricultural landscape remains both productive and climate-resilient. *[NAP 2018; NAMP 2020; CSAIP 2019]*