



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

A Report of Checking and validation of different survey output generated by different survey firms (Gangni Upazila).

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Introduction

Purpose of the Physical Feature Survey Data in the Meherpur Project

The primary purpose of the physical feature survey data in this project is to accurately map and document the existing natural and man-made features of the Meherpur area. This geospatial dataset, typically collected through field surveys and remote sensing, plays a critical role in several aspects of planning, development, and management. The main objectives include:

1. To provide a current and comprehensive representation of all physical features such as roads, rivers, buildings, culverts, ponds, vegetation, and utility lines which can serve as a baseline for urban planning and infrastructure development.
2. To enable informed decision-making for construction, rehabilitation, or expansion of infrastructure (examples: drainage systems, roads, and public utilities) by understanding the existing conditions and constraints.
3. To check whether current land use and physical structures align with zoning regulations, planning guidelines, or development plans.
4. Survey data helps engineers and planners create precise design models and avoid conflicts with existing features during implementation.
5. To compare changes over time, allowing authorities to monitor urban expansion, environmental changes, or encroachments.
6. To validate and update the central GIS database used by government or project stakeholders, ensuring reliability in future analyses and reporting.

Importance of Checking and Validation of Survey Data

Checking and validation of survey data are critical steps in the data collection process. They ensure the accuracy, reliability, and credibility of the insights drawn from the data. Without proper validation, survey results can be misleading and potentially harmful for decision-making. Key reasons include:

1. **Data Accuracy:** Ensures that the data correctly reflects the respondents' responses, minimizing errors due to manual entry, misunderstandings, or technical glitches.
2. **Data Consistency:** Identifies and resolves contradictions or anomalies, maintaining the logical consistency of responses.
3. **Improved Data Quality:** Leads to more precise and reliable insights, enhancing the quality of analysis and interpretation.

Data Sources & Types

I have received physical feature survey data that includes various types of GIS shapefiles. These files contain point features, line features, and polygon features.

| Point Features | Line Feature | Polygon Feature |
|-----------------------|-------------------------|-----------------|
| Administrative points | Drain Center Line | Boundary |
| Community facilities | Footpaths | Bridges |
| Drain outfalls | Road Center Line | Road |
| Mobile shops | Road Edge | Structures |
| Open spaces | Water Control Structure | Water Bodies |
| Utility services | | |
| Waste data | | |

The extension format of these shapefiles is **.shp**.

Common Issues Identified in the Data

Incorrect Co-ordinates

When starting digitization in GIS using geographic coordinates, we first set the projected coordinate system to fix the location, deciding whether the feature will fall in 45N or 46N. Since Meherpur is in the 45N zone, it is necessary to select WGS_1984_UTM_Zone_45N at the beginning of digitization. The consultancy firm initially provided the data projected in the 46N zone, which was incorrect. They later corrected this and provided updated data. However, in one of the datasets, an issue remains when attempting to Zoom to Layer, the entire data appears problematic.

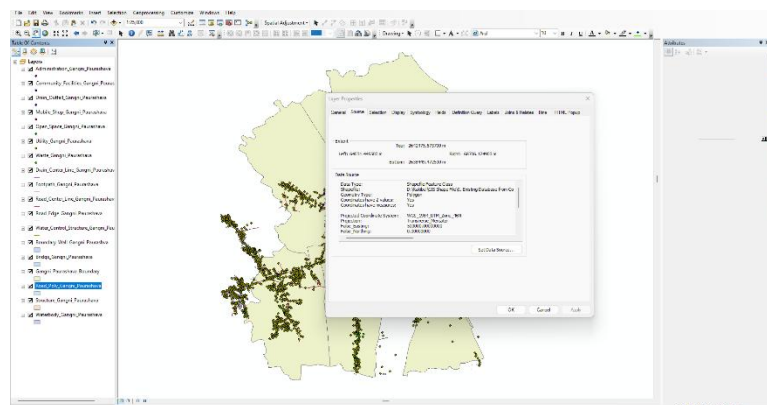


Image: Incorrect Co-ordinate System

Observation of Shape files

Administrative Data

In the case of the administrative data, the firm provided it as a point feature, but there are three data points. Additionally, in the attribute table, there are two entries under the "Type" field with the name "Upazila." However, for this type of data, it can be represented as a structure under "Administrative."

After extracting this data as a separate file and converting it from polygon to point, the issue seems to be resolved.

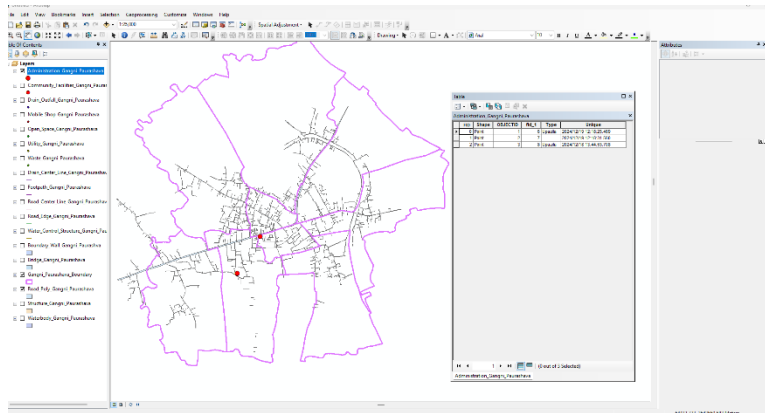


Image: Administrative Location

Community Facilities

For Community Facilities, it is important to determine which data should be included. These are the facilities provided by the municipality, either through its own funding or through government funding.

In this data batch, we can see that there are 33 data points. However, most of the fields in the Attribute Table are empty. Specifically, the Fea_Type field is missing information for the majority of the data. In this case, our recommendation is to fill in the missing fields in the Attribute Table to ensure data completeness.

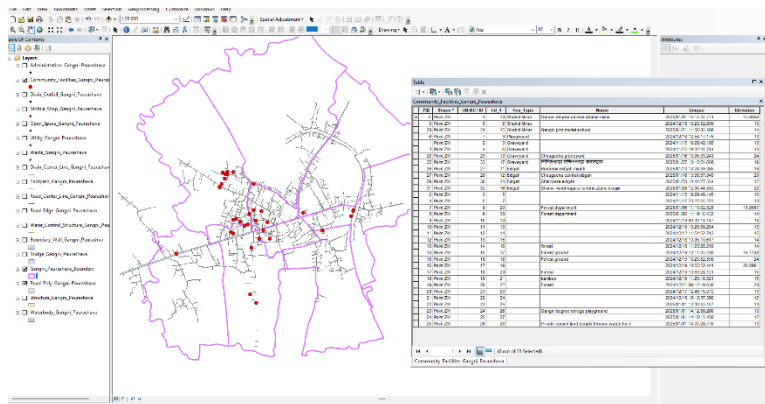


Image: Community Facilities Location

Drain Outfall

The consultancy firm has created point data for drain outfalls. This point data shows the location, but there are only two data points. Ideally, there should have been more data representing the locations of drain outfalls.

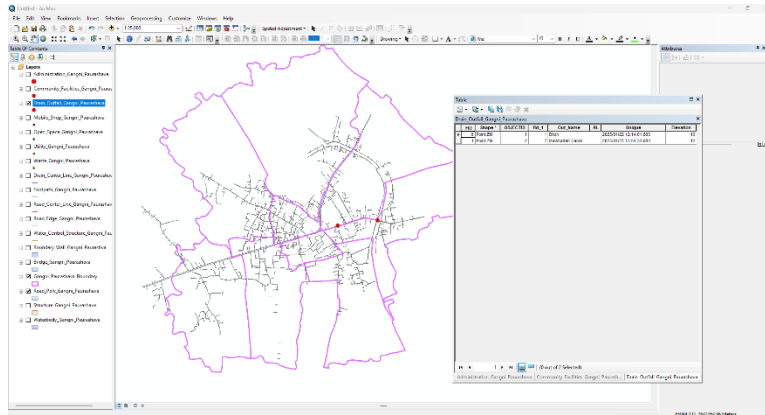


Image: Drain Outfall Location

Mobile Shop

Mobile shops or movable shops refer to those shops that are set up on vehicles, meaning they are portable. This database should primarily be in the form of point data, representing where these mobile shops typically set up each day. These shops are usually located along the roadside.

This database contains a total of 32 data points. However, there are some factual errors in the Type and Name fields in the Attribute Table, and some fields are empty, which should have been filled with the correct information.

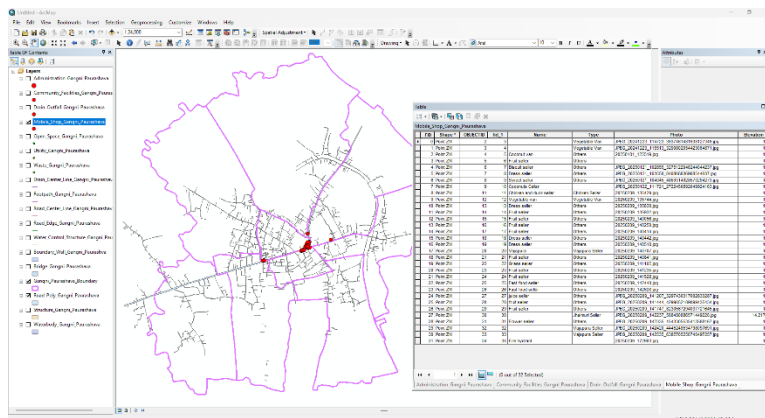


Image: Mobile Shop Location

Open Space

In the “Open Space” shapefile, many fields in the “Type” and “Name” columns of the attribute table are empty. Additionally, the “Name” field contains entries written in both Bengali and English. These issues need some editing.

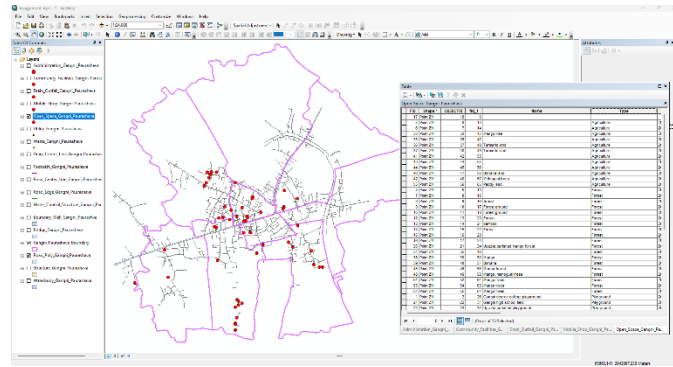


Image: Open Space Location

Utility Facilities

For Utility Facilities, the entire urban area has not been fully covered. This needs some attention. Additionally, areas like Electric Substations and Telephone Exchanges should be represented as polygons.

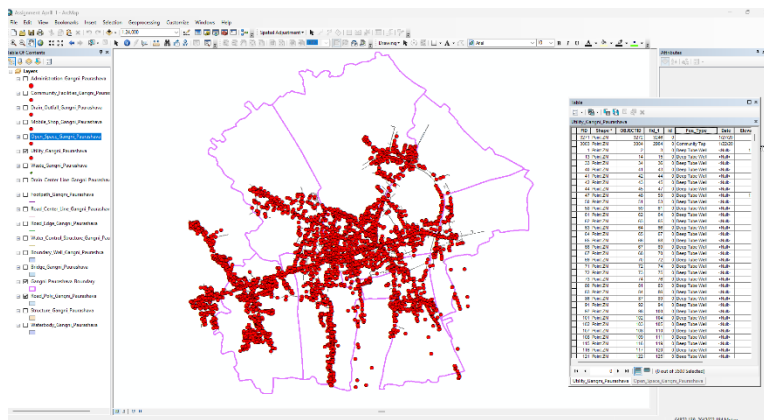


Image: Utility Facilities Location

Waste

Only one “waste dumping zone” has been shown for the entire area. We believe there might be a few more dumping sites within the entire urban area.

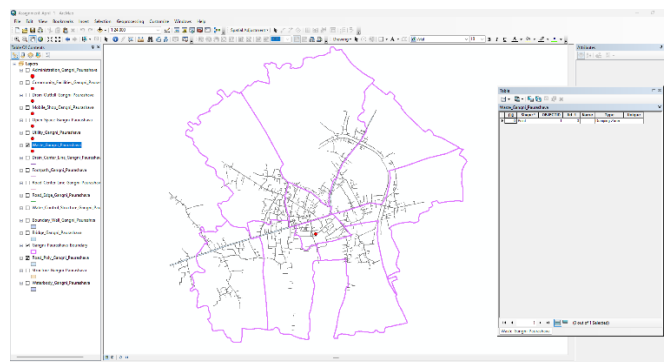


Image: Waste Dumping Zone Location

Drain Center Line

The “Drain Center line” shapefile does not include the drain lines for the “Gangni to Kathuli” and “Gangni to Dhankhola” roads. Additionally, the drain lines along both sides of the “Gangni to Kushtia” and “Gangni to Meherpur” roads are incomplete. Updating these elements in the shapefile will complete the drain line network. Additionally, the width of one drain line is 70 and the depth is 0.

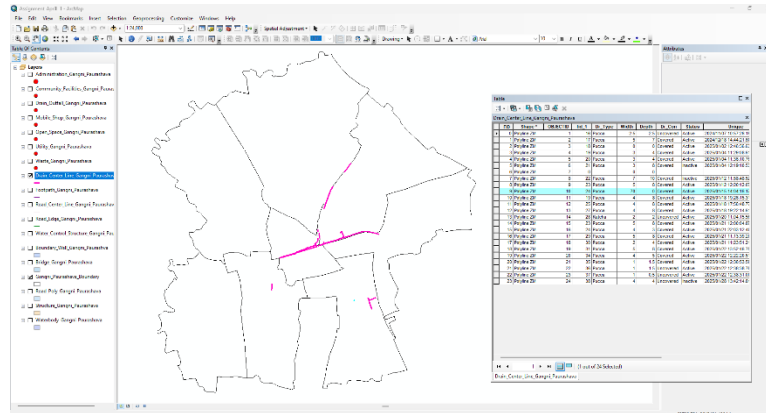


Image: Drain Line Location

Footpath

In the “footpath” shapefile, only a small portion of footpaths has been drawn, and that too only along the “Gangni to Alamdanga” road. Footpaths on both sides of the “Gangni to Kushtia” and “Gangni to Meherpur” roads are missing. These footpaths need to be added to this shapefile.

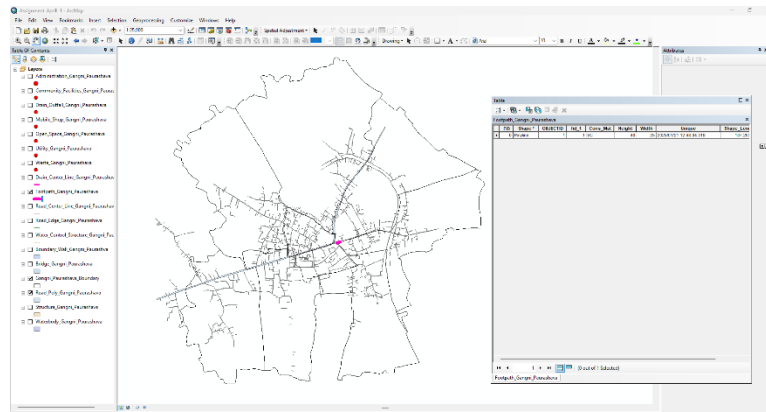


Image: Footpath Location

Road Edge

There is a shapefile named “Road Edge” that contains 9 files. It is unclear what “Road Edge” represents, as there is no mention of it in the “ToR”. Therefore, it needs to be assessed whether this “Road Edge” data is actually necessary.

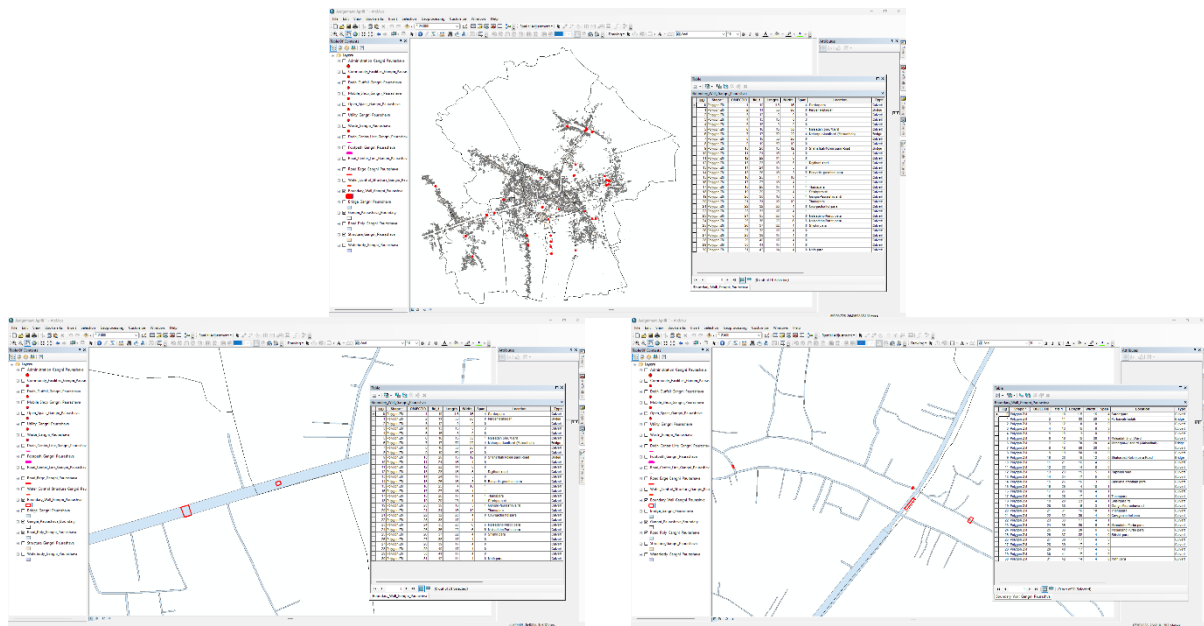


Image: Boundary Wall Location & Drawing Error

Bridge

The Bridge shapefile's attribute data contains 31 entries. However, the data in this shapefile is identical to that of the Boundary Wall shapefile. This issue needs to be addressed.

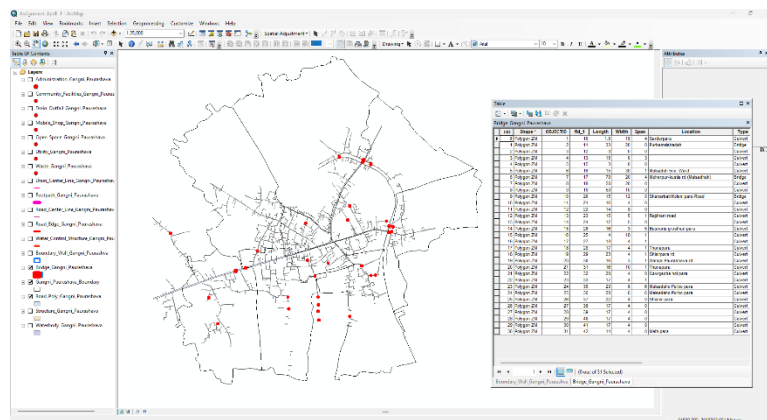


Image: Bridge Location

Road

There are two shapefiles for Roads – one is a Center Line file, and the other is a Polygon file. The road data does not fully cover the entire urban area. In many places, roads are present, but the center lines are missing. Conversely, in some cases, center lines exist, but the polygon data is missing. Many fields in the Road Hierarchy are empty. These issues need to be corrected.

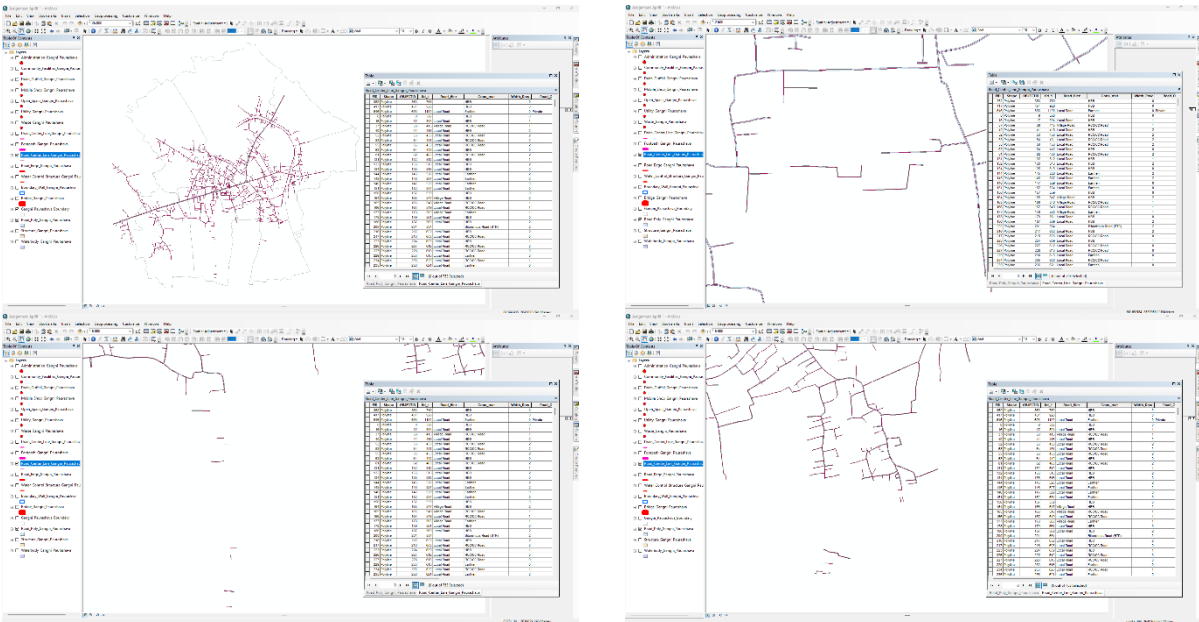


Image: Road Location & Drawing Error

Structure

Some data in the Structure shapefile have overlaps, and there are also issues in certain areas. In many places, structures have been drawn where no actual structures exist. Additionally, some structures were not drawn accurately. These issues need to be corrected, and the structure mapping for the entire urban area should be completed.

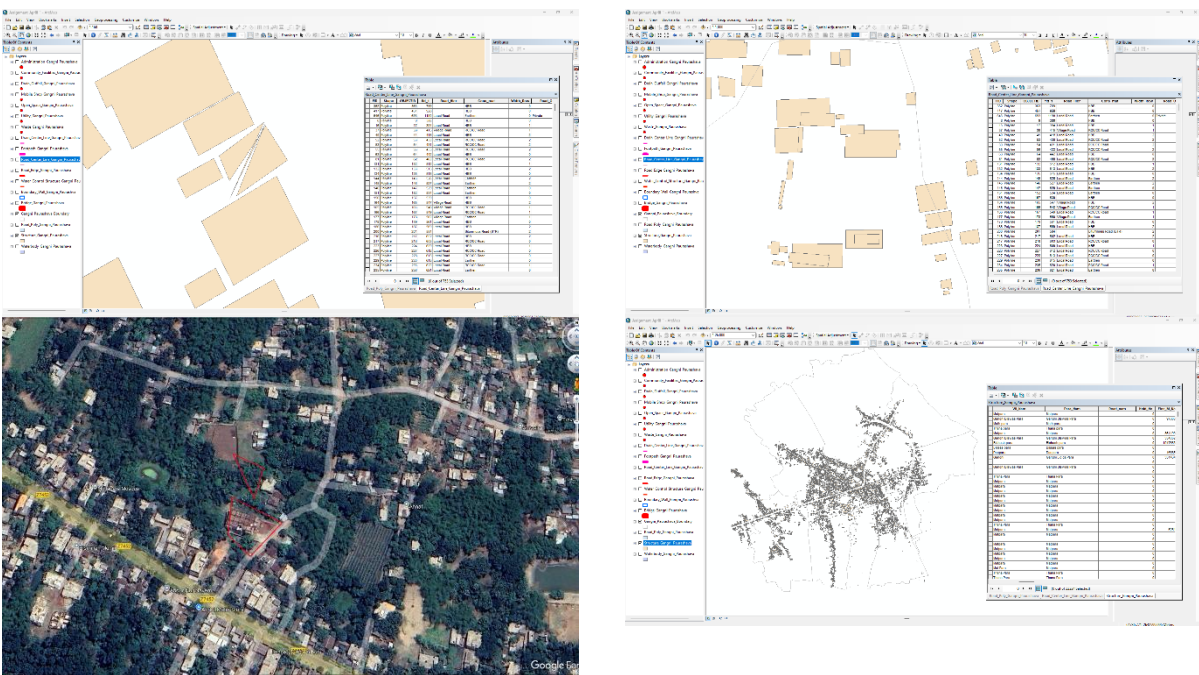


Image: Structure Location & Drawing Error

Waterbody

The Water Body shapefile contains a total of 292 data points. However, many other water bodies within the entire urban area have been missed and need to be added.

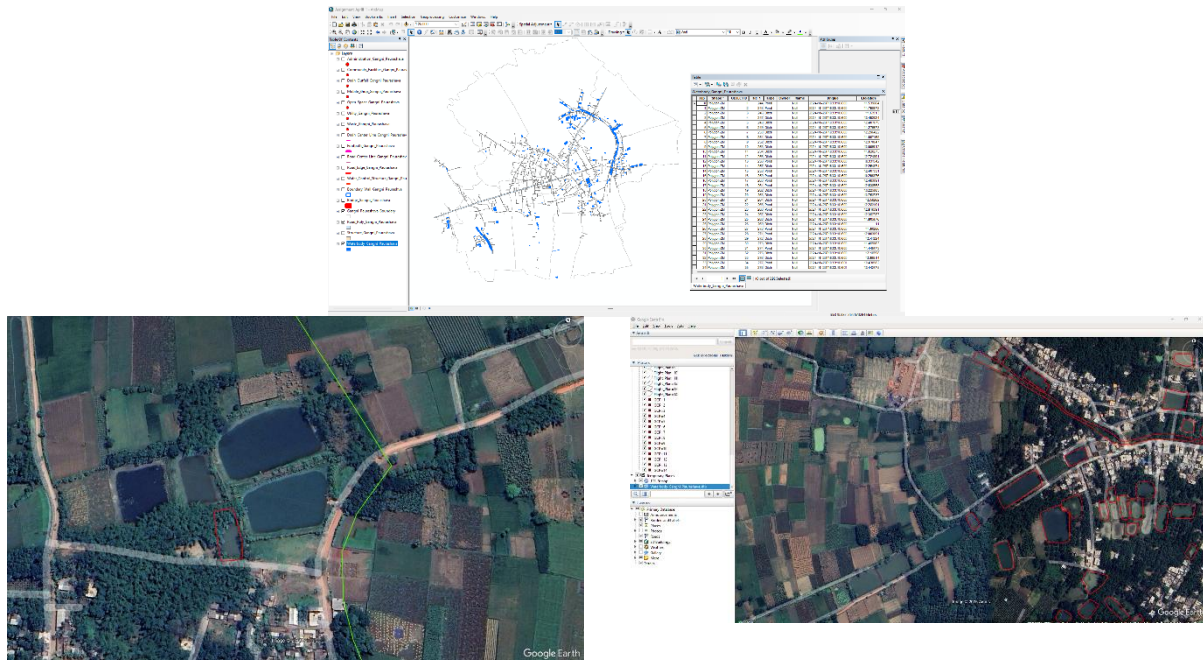


Image: Water Body Location

Conclusion

After the above observations, it can be said that paying attention to certain aspects while creating physical feature data can significantly reduce errors. For example,

1. Ensuring correct coordinates when creating shapefiles,
2. Accurately drawing features,
3. Avoiding overlaps, and
4. Fully populating the attribute tables.

Keeping these things in mind makes digitization much easier and reduces the likelihood of errors.