Bangladesh Bureau of Statistics
Ministry of Planning

User Manual

of

Integration of GIS Data and Information on Environment, Climate Change, Natural Resources and Disaster for the Development of Web Application

under the Strengthening Environment, Climate Change and Disaster Statistics (ECDS) Project, BBS

August 2022

CEGIS
Center for Environmental and Geographic Information Services

User Manual

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1. Introduction

1.1 Background

Bangladesh is one of the most disaster-prone countries due to climate change. It is intensified by the country's geographical position, land features, numerous crisscrossed rivers, and monsoon climate. As a result, we are incredibly vulnerable to natural disasters. Since the country is prone to harsh weather, loss and destruction are frequently large, putting the national economy at risk. Bangladesh ranked 6th on the list of countries most hit by climate disasters from 1999 to 2018 in the 2020 edition of German Watch's Climate Risk Index. This index focuses on Bangladesh's scary scenario in terms of climate impacts and natural disasters. Sea level rise, storms, cyclones, droughts, erosion, landslides, flooding, salinization, and other natural disasters are already displacing a considerable number of people from the coastline and hilly areas and destroying infrastructure, human lives, and wealth. Despite all of its flaws, Bangladesh is one of the most resilient countries, and it is making gradual progress toward achieving the Sustainable Development Goals (SDGs). Numerous initiatives, research papers, surveys, and other activities are being carried out in development that require reliable data and information for successful decision-making.

In recent years, the government has initiated multiple projects through numerous agencies and government departments to collect, generate, and update relevant statistics, so that policymakers could benefit from the information. The Bangladesh Bureau of Statistics (BBS) is an independent national body under the Government of Bangladesh (GoB) that collects and disseminates statistical data and information. The "Inter-Ministerial Technical Working Committee" produced "Environment, Climate Change, and Disaster Statistics." To that end, the "Environment, Climate Change, and Disaster Statistics (ECDS) Cell" was established. This cell proposed a platform/interface to provide necessary environmental and climate risk data and information to ensure disaster resilient development. However, as such, there is no comprehensive geographical interface to assist the government officials, academicians, and researchers to integrate disaster and climate risk data and information into development projects, plans, and programs for decision making and planning for risk-informed public investment.

1.2 Objectives

The establishment of ECDS is to generate statistics on the environment, natural resources, biodiversity, climate change, and disasters to institutionalize environmental statistics in Bangladesh. However, this project has established some specific objectives. The primary outcomes of this project are 'Compilation of Bangladesh Environmental Statistics 2020,' 'Bangladesh Environmental Protection, Expenditure, Resource, and Waste Management Survey 2021,' 'Natural Resource: Experimental Ecosystem Accounts/Statistics in Bangladesh 2022,' and 'Multi-sectoral GIS integration of the affected population with area, deaths, and missing population due to climate change and natural disasters.

The specific objectives of this project are:

- empower the government, academia, and researchers to securely host, manage, share, visualize, and analyze geospatial data by establishing a well-designed sustainable geo-portal system
- have operational experience handling and publishing various maps and data
- cooperate with government officials in project appraisal and planning process

1.3 System Features

- Spatial data analysis in different geographic regions
- Login-based authorization system with dynamic user permission and access
- View Map and Data Layers based on Theme and Components

- Download Map image as png/jpeg format
- Upload Shapefile and Data Layer information
- Download shapefile based on selected layers
- Download Admin Boundary Information in a different format
- View Meta Data and Layer based information based on user access
- Administrative user Management control with grant and revoke user access privilege

User Level	User Access									
	Dashboard	Map Viewer	Tabular Data Download	Shape File Download	Upload File and Add Information	Update & Delete Information	Layer Information View	User Management	Access Management	Activity Log Management
BBS Admin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BBS Registered User	✓	✓	✓	✓	✓		✓			
Authorized User	✓	✓	✓	✓			✓			
General User	✓	✓								

Figure 1.1: Stakeholders of ECDS Platform

1.4 Contact Us

To learn more information how to contact the ECDS authority User can click on the Contact Us link from the navigation bar. After clicking the link, a page like the below would be displayed on the screen.

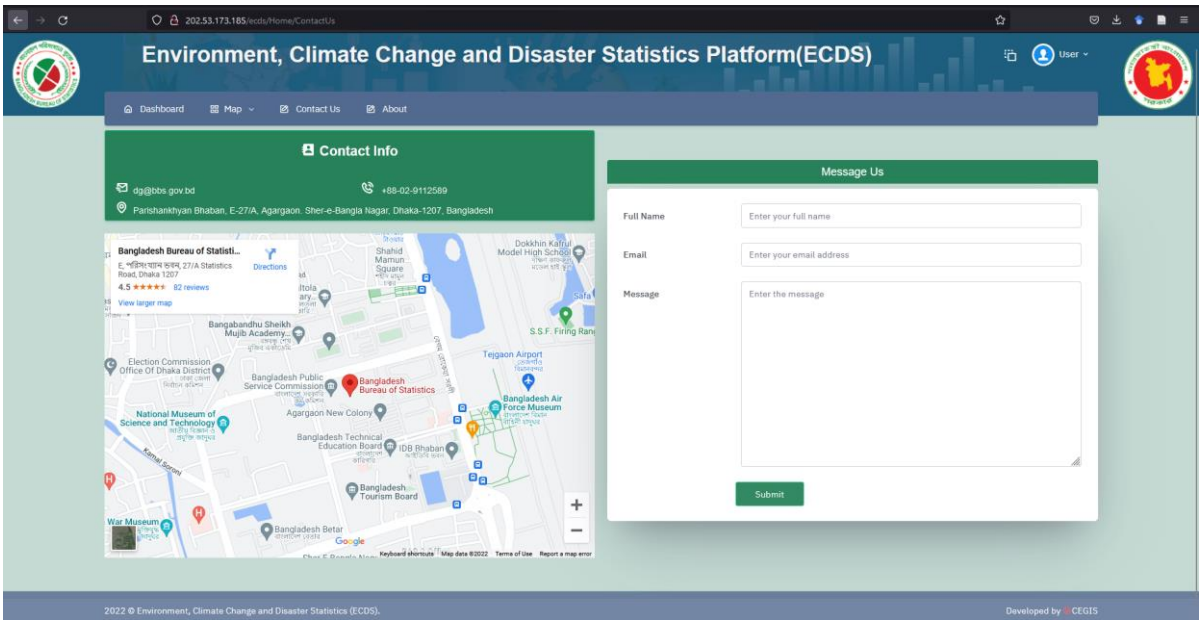

Figure 1.2: Contact Us Page

1.5 About Us

To learn more information about our mission and vision please visit the about us page.

Figure 1.3: About Us Page

2. Dashboard

The Dashboard page of the ECDS platform consists of several graphs images and vital information related to Bangladesh. There are some animatic images on the right-hand side showing some features of this web application.

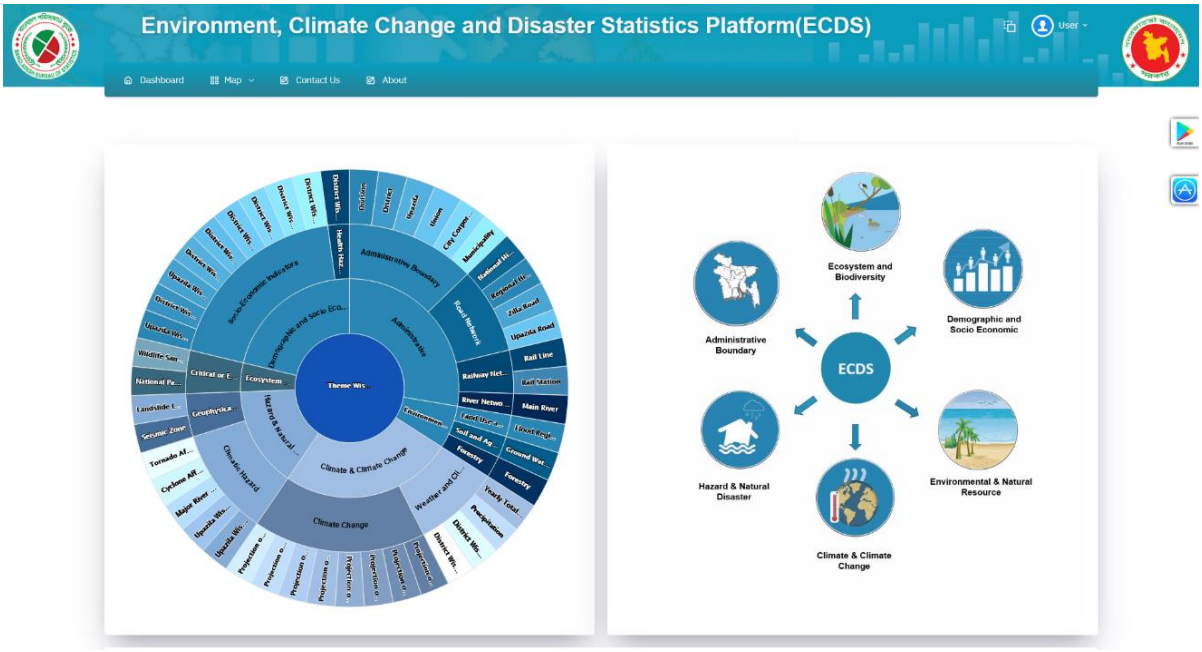

Figure 2.1: Dashboard Upper Part

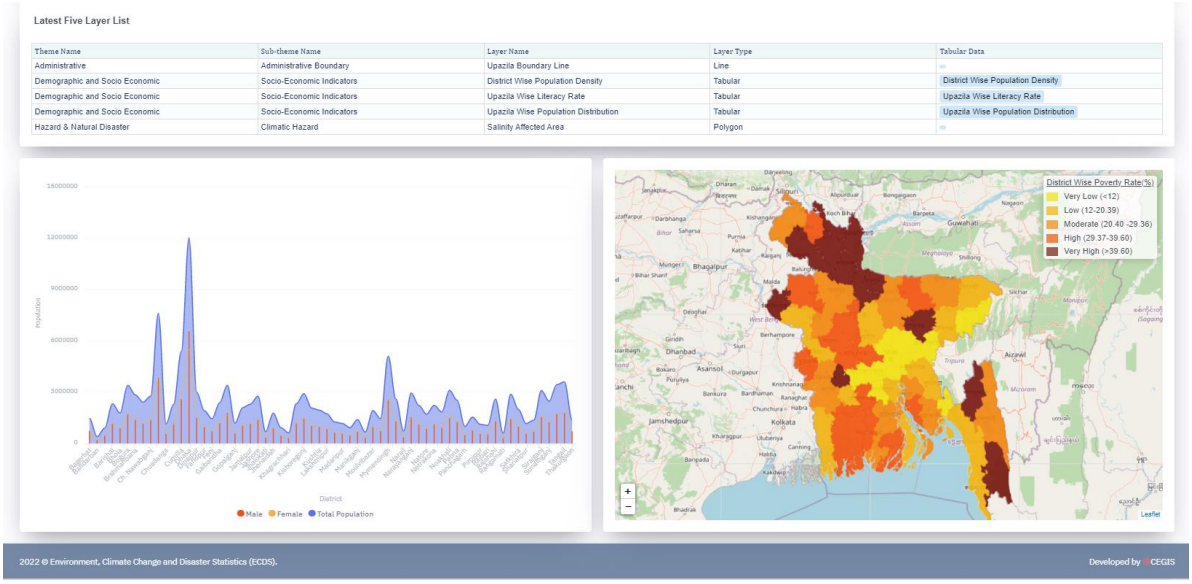

Figure 2.2: Dashboard Lower Part

The figures illustrated above portray some of the vital information on layers, population, and poverty. Also, there graphical representation of the distribution of attributes in layers.

3. Map View Module

The user of the ECDS platform has the option to preview a map in two modes. One is view-only mode and the other is comparison mode. By using the view mode user can view the map by adding different layers on top of it and export the item in png format. Consequently, in the comparison mode, all the features of the view mode are available with an extra feature to compare between two maps.

3.1 Customization Options

The map customization bar is available on the right side of the map. There are several options such as adding map layers, filtering the map, changing the map background, resetting the map, extending the map to full screen, showing or hiding map levels and regions, and finally the map download options.

Figure 3.1: Map Customization Bar

3.2 Map Settings

To change or add the map layers click on the map settings and the user can see Six map layers in the ECDS platform. They are

- Administrative
- Climate and Climate Change
- Demographic and socio-economic
- Ecosystem and Biodiversity
- Environmental & natural resources
- Hazard & natural disaster

Each of the map layers has several sub-layers. Like administrative boundary has three sublayers like administrative boundary, railway network, river network, and road network. Climate and climate change consist of another two-options climate change, weather and climate. Demographic and socio-economic theme comprises two sub-types as health hazard data, socio-economic indicators. Ecosystem and biodiversity theme also comprises two sub-types as bio-ecological zone, and critical or endangered areas. Environmental and natural resources layers have sub-layers of 3 different types which are forestry, land use and land cover, physiography and geology, and soil and agriculture. Hazard & natural disaster has two sub-layers such as climatic hazard, geophysical hazard, and pollution and other hazard data.

- ❖ Administrative
  - Administrative Boundary
  - River Network
  - Road Network
  - Railway Network
- ❖ Climate and Climate Change
  - Climate Change
  - Weather and Climate
- ❖ Demographic and socio economic
  - Health Hazard Data
  - Socio-Economic Indicators
- ❖ Ecosystem and Biodiversity
  - Bio-Ecological Zone
  - Critical or Endangered Areas
- ❖ Environmental & natural resources
  - Forestry
  - Land Use and Land Cover
  - Physiography and Geology
  - Soil and Agriculture
- ❖ Hazard & natural disaster
  - Climate Hazard
  - Geophysical Hazard
  - Pollution and other Hazard Data

3.3 Map Filtering

Map layers can be filtered using the Map Filter icon. On the right panel. Click on the icon a pop-up menu will appear on the screen.

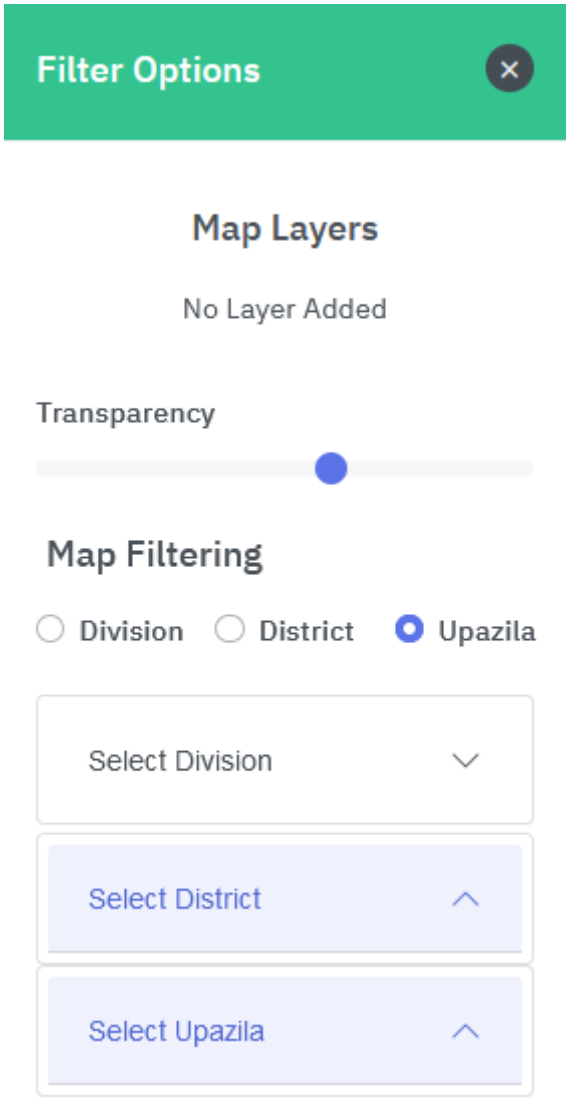

Figure 3.2: Filter Options

Here the user can set the transparency level by moving the slider right or left. There are three different options for filtering map data by Division or District or Upazila. Based on the need, a user can select different filtering options and administrative boundaries to filter the data.

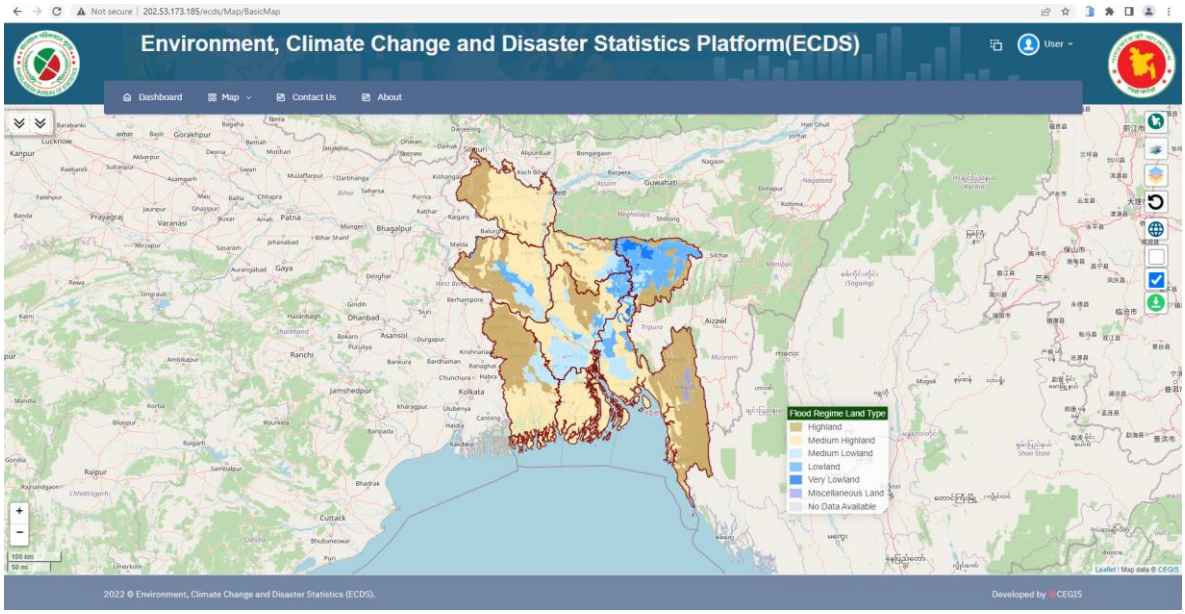

Figure 3.3: View Map Layer

3.3.1 Background Layer Options

- Open Street
- Google Hybrid
- Google Satellite
- Google Street
- Google Terrain
- My customer
- Esri

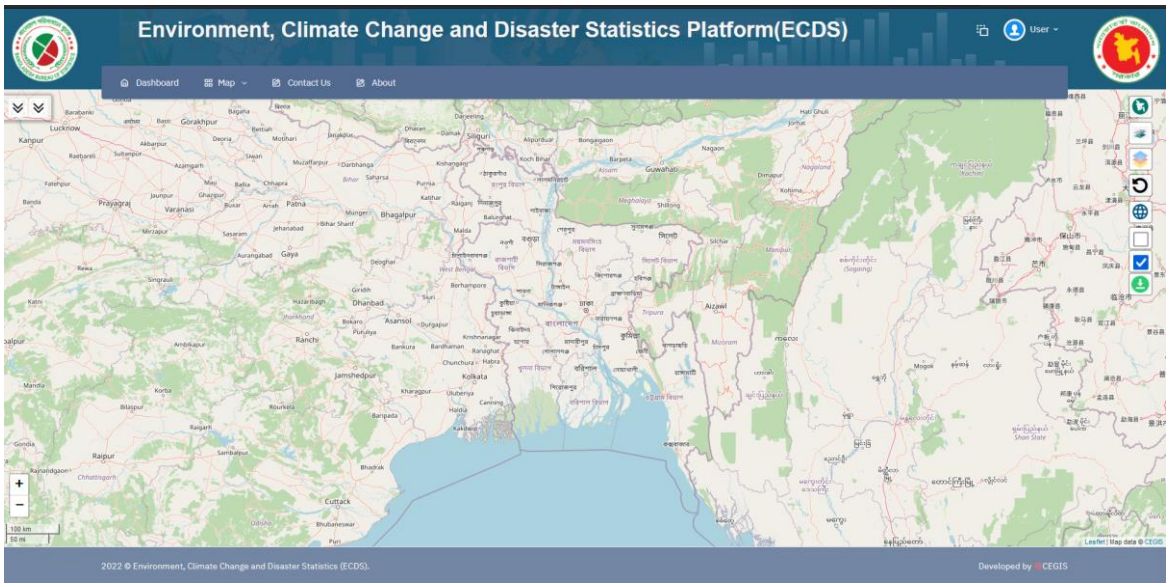

Figure 3.4: Open Street Layer

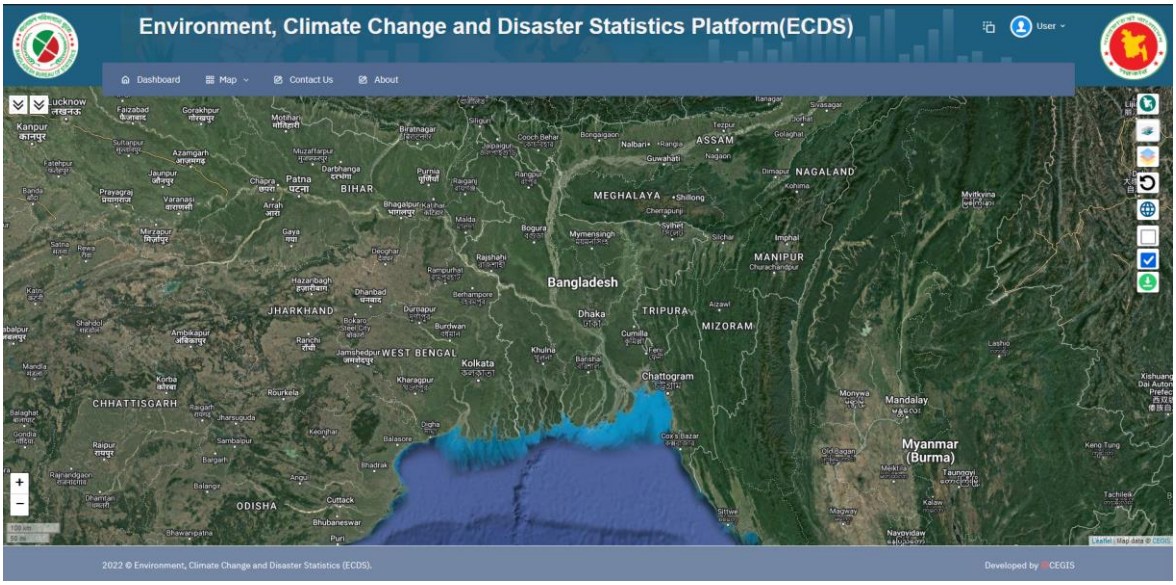

Figure 3.5: Google Hybrid Layer

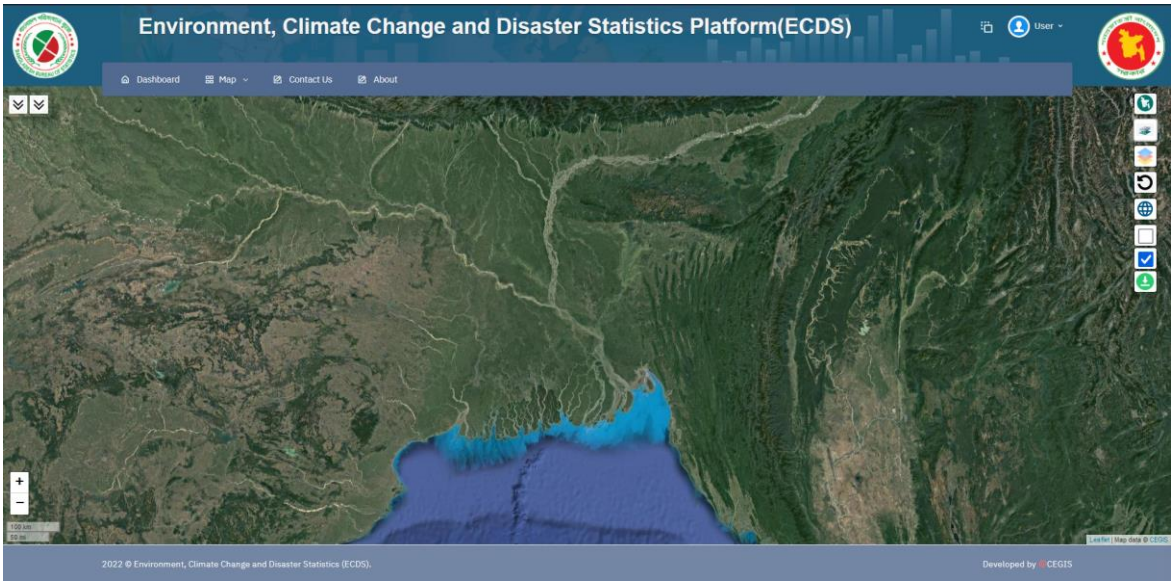

Figure 3.6: Google Satellite Layer

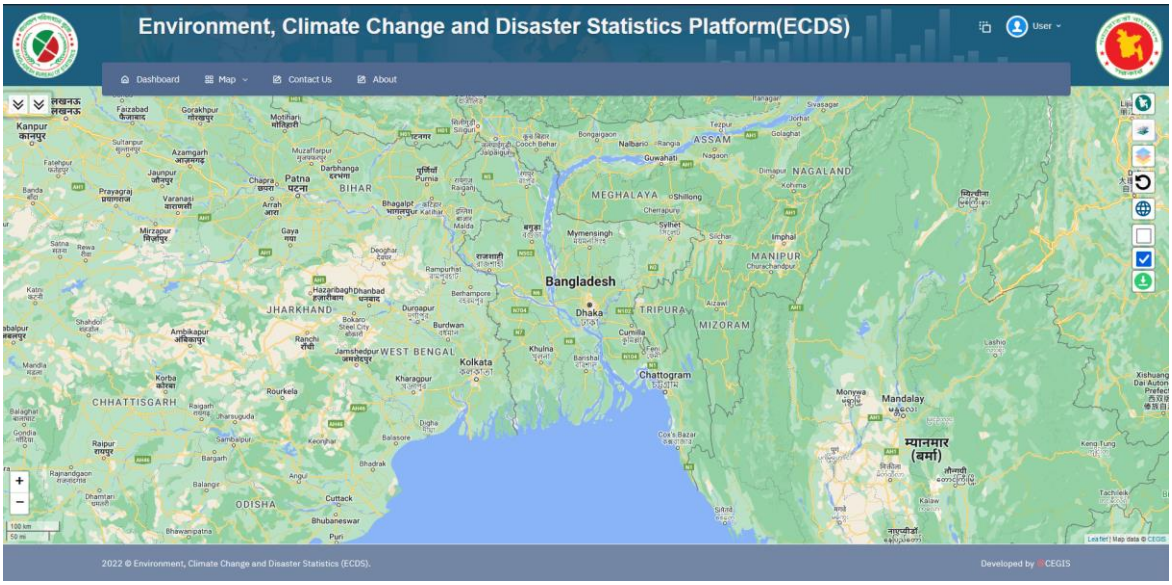

Figure 3.7: Google Streets Layer

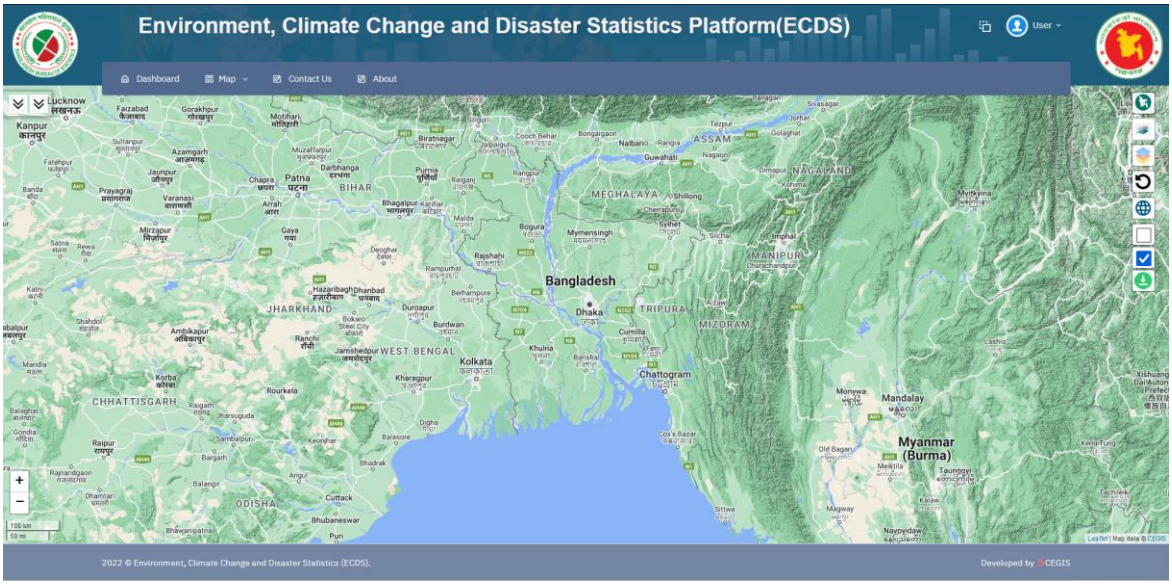

Figure 3.8: Google Terrain Layer

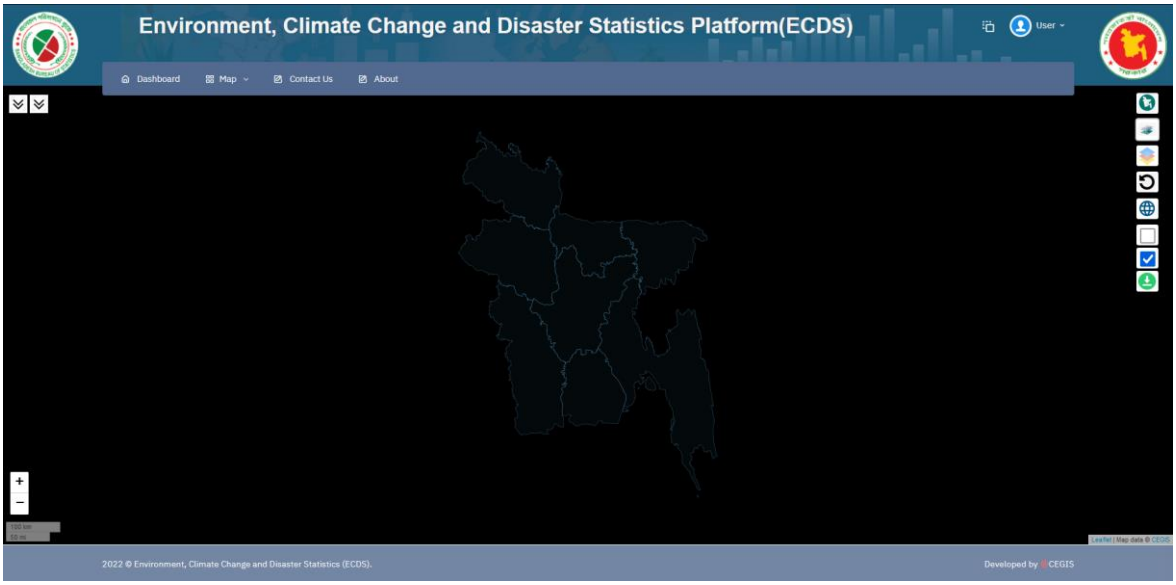

Figure 3.9: My Customer Layer

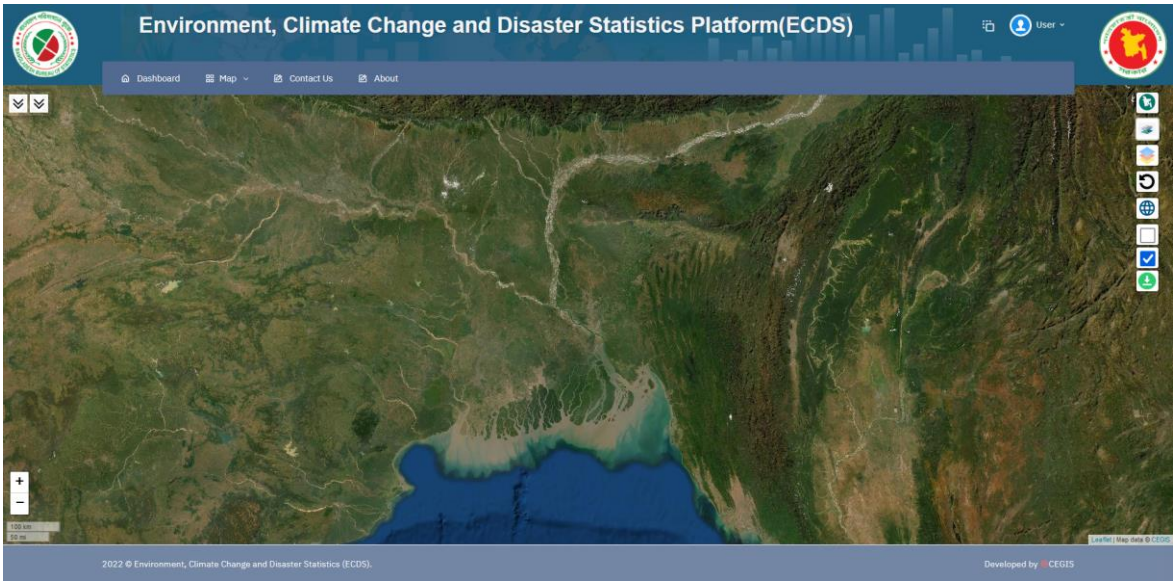

Figure 3.10: ESRI Layer

3.3.2 Map Comparison

To compare the layers based on a different time or different layers in a specific period the user can utilize the map comparison panel.

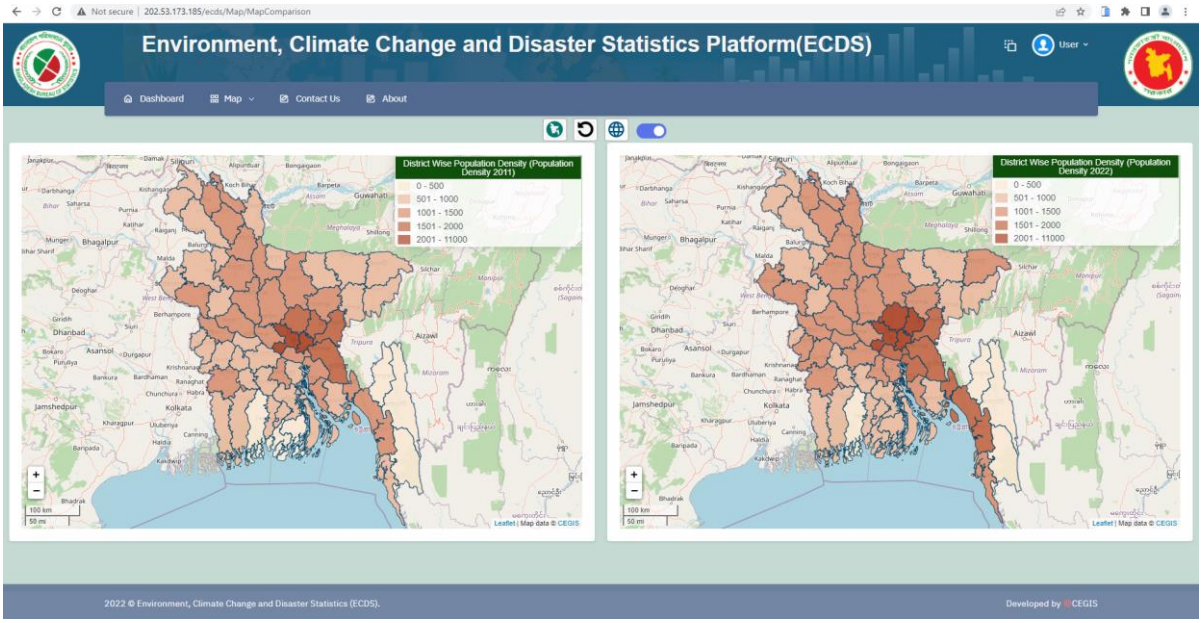

Figure 3.11: Comparison of Maps

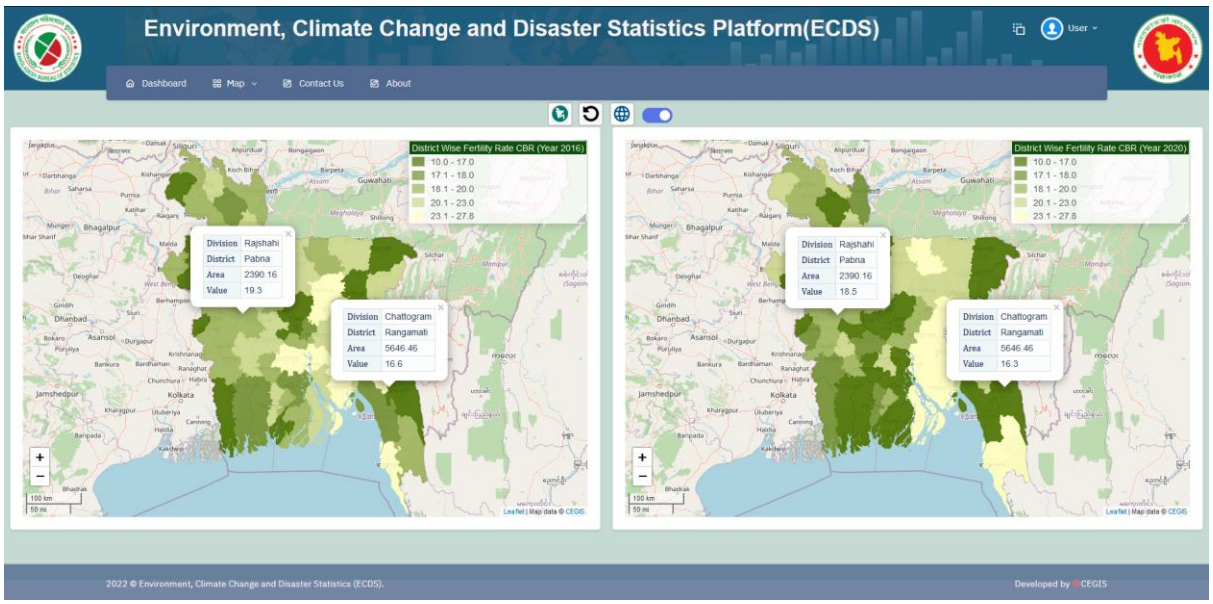

Figure 3.12: Comparison of Values in Maps

3.4 Google Play Store

The user of the ECDS platform has the option to preview all data in Android-based mobile. Users can download the app on the google play store. By using the app users can view the map by adding different layers on top and navigate all data on an Android-based mobile phone. Consequently, in the comparison mode, all the features of the view mode are available with an extra feature to compare between two maps.

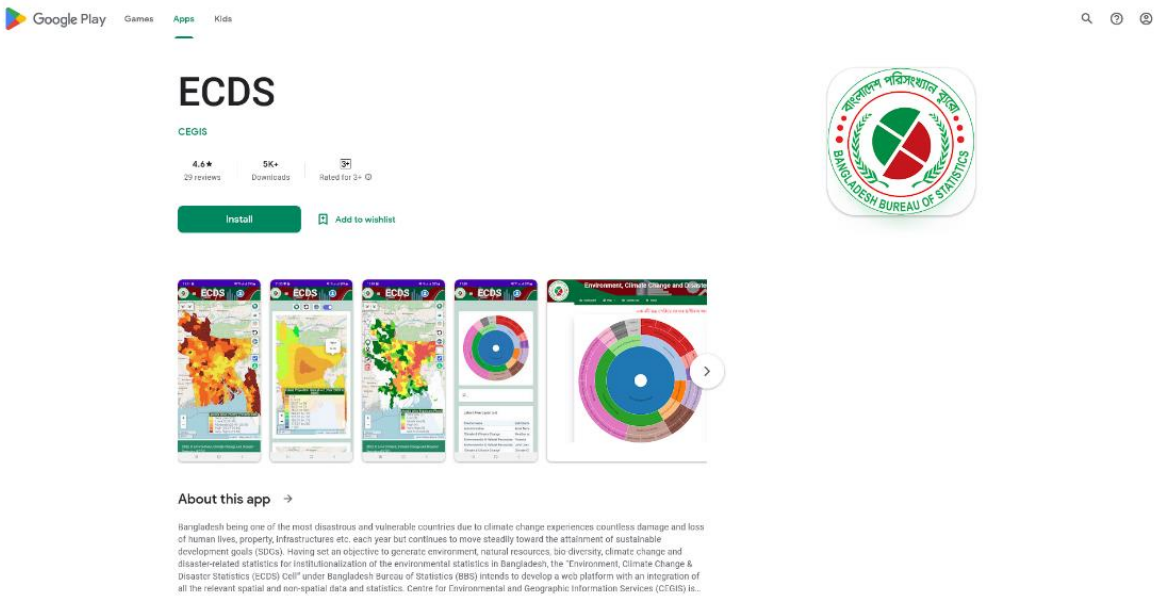

Figure 3.13: Google Play Store

3.5 App Store

The user of the ECDS platform has the option to preview all data on iPhone. Users can download the app on the App store. By using the app users can view the map by adding different layers on top and navigate all data on an iPhone. Consequently, in the comparison mode, all the features of the view mode are available with an extra feature to compare between two maps.

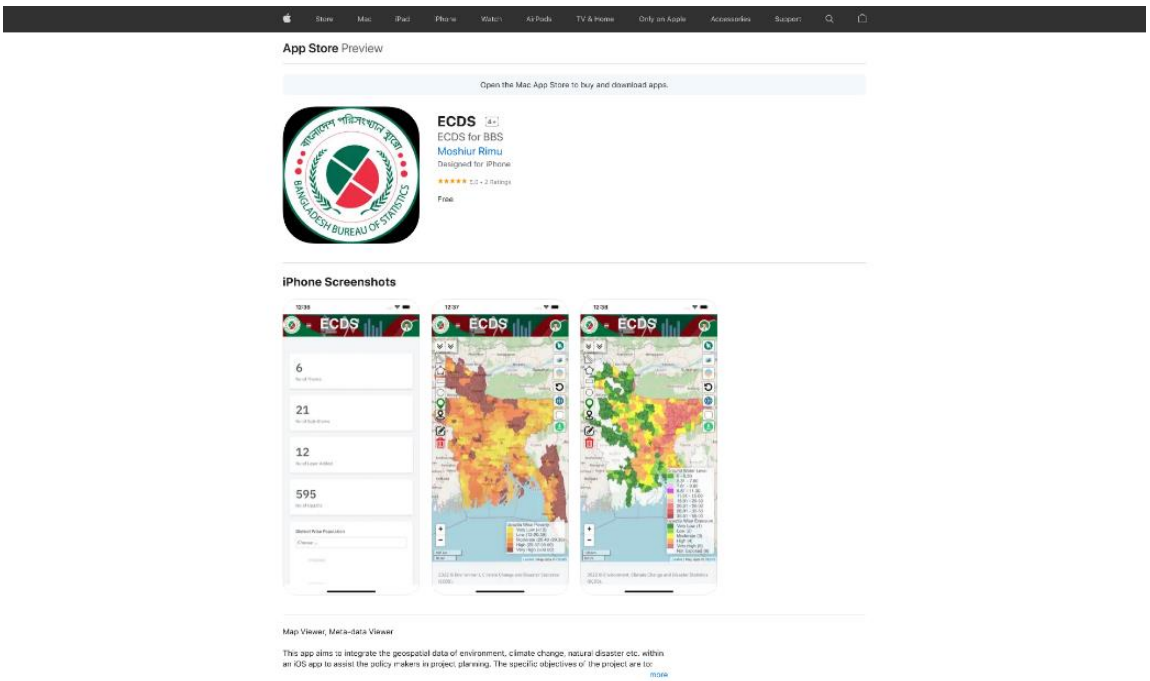

Figure 3.14: App Store