



Monitoring of some disaster areas in indonesia Using arcview 3.3

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ARTICLE INFO

Abstract

Article history:
Received: 30 July 2021
Revised: 12 August 2021
Accepted: 30 August, 2021

Elements in the mapping of disaster areas are rainfall, slopes, residential areas. Conformity The data input is adjusted to the data retrieval in the form of spatial in shape, data processing using the Arcview 3.3 application. Disaster data is taken from the geospatial homeland of Indonesia. Data analysis was carried out by scoring the data first, then forming a map of the disaster area for floods, landslides, rainfall, slopes. Potential disasters can be seen and anticipated by looking at the data listed and the existing weather forecasts.

Keywords:

ARCVIEW 3.3, Regional Mapping, Disaster

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1. Introduction

The most important use of spatial data for input to geographic information systems. Spatial data can be said to refer to location characteristics determined in a unique way based on geographic position and basic topography having location, dimension, and shape (.Shp) (Tuman 2001). Spatial database on soil, soil, erosion, slope, elevation, soil type, source of building materials and distribution of constructed settlements. Where can be done by remote sensing using satellite Digital Elevation Model (DEM). There is regional map data in Indonesia using the link <https://tanahair.indonesia.go.id/portal-web/download/perwilayah>, which consists of administrative data, buildings, cultural heritage, lakes, electricity, bridges and several other data in the form of .shp, shx, dbf, prj.

The data processing can use the Arcview application in this study using Arcview 3.3. The features available can help in making maps, analyzing disaster data in Indonesia, inputting data starting from tool views, themes, graphics. The use of Arcview 3.3 on the electricity distribution research data map [1], the creation of watersheds [2]. Flood natural disaster mitigation [3], trade [4], poverty [5]. conventional maps [6] and book Learning Geographic Information Systems (GIS) Using Arcview 3.3 [7]

The study in this study is the monitoring of several disaster areas in Indonesia in landslides, floods and landslides using the Arcview3.3 application.

2. Literature Review

2.1 Data Spasial

The ability to analyze systems such as statistical analysis and overlays is spatial analysis. Analysis using Geographic Information Systems which is often used with the term spatial analysis, unlike other information systems by adding the dimension of 'space' geography [8]

In general, the human perception of the form of representation of a spatial entity is a concept rasters and vectors. Spatial data represented in the database as raster or vector. To determine absolute position based on coordinate system. For small areas, the system the simplest coordinate is grid regular rectangle. For larger areas, based on common cartographic projections used.



One of the basic ways to create or recognize spatial relationships is through the spatial overlay process. Spatial Overlay done by performing join operations and displaying together a set of data that are used together or are in the same area. The result of the combination is a new set of data that identifies a new spatial relationship [9].

Spatial data generation :

1. Polygon Data Type

including sub-district administration, residents, flood locations, Social Social Welfare, slum areas, and landuse. In Project :View select menu View, New Theme, a New dialog box will appear Themes.

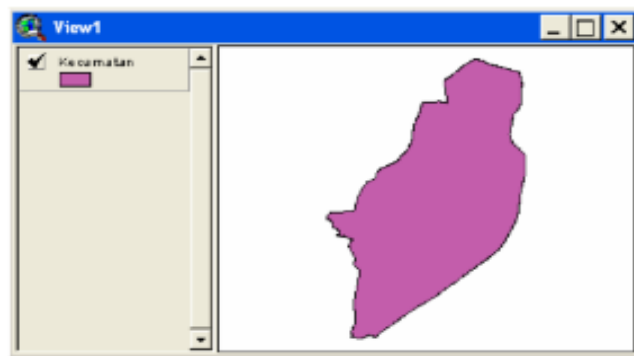


Fig 1. Polygon Data Type Display View

2. Tipe Data Point

Consists of busway stops, train stations.

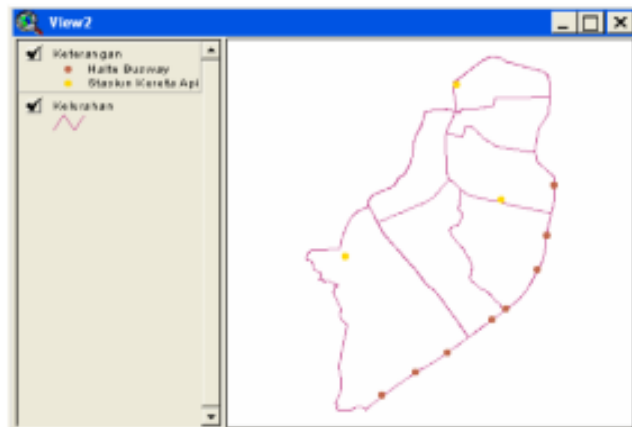


Fig 2. Display Point Data Type View

2.2 Disaster

Distribution of Disasters according to Undang-Undang Republik Indonesia No.24 of 2007 [10]:

1. Disaster is a series of events that threaten and disrupt people's lives and livelihoods caused, either by natural factors and/or non-natural factors as well as human factors.
2. Natural disaster is a disaster caused by an event or series of events caused by nature, including earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides.
3. Non-natural disasters are disasters caused by non-natural events or series of events which include technological failures, failed modernization of epidemics, and disease outbreaks.

Landslides can be defined as downward movement of soil or rock mass caused and triggered by natural factors such as rock type, landform, rock structure and layering, slope, soil thickness or weathered material, rainfall and cover. vegetation (cider) [11]

Table 1. Classification of Regional Stability Index

Stability Index	Class	Category	Description	Landslide Potential Class
SI > 1.5	1	1	The Stability Index (SI) in these classes does not support the occurrence of landslides.	Stable (No Potential)
1.5 > SI > 1.25	2			
1.25 > SI > 1.0	3	Low stable		
1.0 > SI > 0.5	4	Low landslide potential	The Stability Index (SI) in these classes supports and has a tendency to have the potential for landslides	Low Potential
0.5 > SI > 0.0	5	Medium landslide potential		Medium Potential
0.0 > SI	6	High landslide potential		High Potential

Source: [12].

2.3 Arcview 3.3

ArcView is a geographic information system and mapping desktop software developed by ESRI (Environmental Systems Research Institute, Inc). Users can visualize, explore, spatially, analyze data geographically. Arc View capabilities in general, data exchange, statistical analysis and mathematical operations, displaying spatial information, spatial queries, creating thematic maps.

components consist of : Project (view, theme, tabel, chart, layout, script), Theme (shapefiles, coverage (Arcinfo), and raster images, View (points, lines, polygons), Table (layer certain in tabular form), Chart (lines, bars, columns, xy scatter, area, and pie) [13].

3. Research Methodology

3.1 Research Subjects and Objects

Data on Disaster Areas in Indonesia, using Arcview 3.3 application. Retrieval of disaster data spasial for the Indonesian region: Making Disaster Data for Flood and Landslide Areas

3.2 Observation

Disaster data input in Arcview3.3 application processing, the data is downloaded at <https://tanahair.indonesia.go.id/>, then select Medan city data. After that, input the data using the layout in the view tool with the .shp data type, input the residential data in the following table :



Table 2. Medan City Settlement Data

Shape	Name	Fcode	Remark	Sg	Lt	Locode	Mcode	Shape_area	Sshape_area
Poligon2	Ajibaho		Pemukaaan dan Tempoa Fagaa			GA0040		0.0310544671	0.0000020607
Poligon2	Amababali		Pemukaaan dan Tempoa Fagaa			GA0040		0.04662802744	0.00001404207
Poligon2	Amababali		Pemukaaan dan Tempoa Fagaa			GA0040		0.01346027205	0.0000045012
Poligon2	Amplas		Pemukaaan dan Tempoa Fagaa			GA0040		0.00458328890	0.00000128421
Poligon2	Amplas		Pemukaaan dan Tempoa Fagaa			GA0040		0.02089147233	0.00001346206
Poligon2	Amplas Taha		Pemukaaan dan Tempoa Fagaa			GA0040		0.02053912522	0.00001917575
Poligon2	Andanan		Pemukaaan dan Tempoa Fagaa			GA0040		0.01415060119	0.00000347953
Poligon2	Andanan		Pemukaaan dan Tempoa Fagaa			GA0040		0.00200304980	0.0000011233
Poligon2	Andanan		Pemukaaan dan Tempoa Fagaa			GA0040		0.0267209333	0.00000476886
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.00332792294	0.00000049136
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.0014400313	0.00000051680
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.00524702952	0.00000036623
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.01968076244	0.00000010848
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.04270146830	0.0000019563
Poligon2	Asaa Abu		Pemukaaan dan Tempoa Fagaa			GA0040		0.00631947330	0.00000020862
Poligon2	Asaa Abu Enam		Pemukaaan dan Tempoa Fagaa			GA0040		0.00395193077	0.00000070388
Poligon2	Asaa Lumbang		Pemukaaan dan Tempoa Fagaa			GA0040		0.01191916863	0.00001323207
Poligon2	Asaa Lumbang		Pemukaaan dan Tempoa Fagaa			GA0040		0.00181419562	0.00000019111
Poligon2	Asaa Lumbang Dua		Pemukaaan dan Tempoa Fagaa			GA0040		0.00520392884	0.00000059076
Poligon2	Asaa Lumbang Dua		Pemukaaan dan Tempoa Fagaa			GA0040		0.00409117144	0.00000029142
Poligon2	Asana KODAM Bala Basan		Pemukaaan dan Tempoa Fagaa			GA0040		0.01371704159	0.0000026712
Poligon2	Asana Maana Pangalalanama		Pemukaaan dan Tempoa Fagaa			GA0040		0.01046830910	0.00000450989
Poligon2	Asana Maana Pangalalanama		Pemukaaan dan Tempoa Fagaa			GA0040		0.00380214392	0.00000070093
Poligon2	Asana TNI Amed Tarangosa		Pemukaaan dan Tempoa Fagaa			GA0040		0.011802012636	0.00000048843
Poligon2	Aua		Pemukaaan dan Tempoa Fagaa			GA0040		0.0006872151	0.00000072480
Poligon2	Aua		Pemukaaan dan Tempoa Fagaa			GA0040		0.00339883870	0.00000074676
Poligon2	Aua		Pemukaaan dan Tempoa Fagaa			GA0040		0.0090245200	0.00000042957
Poligon2	Babara		Pemukaaan dan Tempoa Fagaa			GA0040		0.00740909491	0.00001020326
Poligon2	Baganda		Pemukaaan dan Tempoa Fagaa			GA0040		0.0068003181	0.00000032615
Poligon2	Baganda		Pemukaaan dan Tempoa Fagaa			GA0040		0.0080662763	0.00000448846
Poligon2	Baganda		Pemukaaan dan Tempoa Fagaa			GA0040		0.01217147696	0.00000016574
Poligon2	Baganda		Pemukaaan dan Tempoa Fagaa			GA0040		0.0096681831	0.00000076643
Poligon2	Bakara		Pemukaaan dan Tempoa Fagaa			GA0040		0.00421403953	0.00000003391
Poligon2	Bakara		Pemukaaan dan Tempoa Fagaa			GA0040		0.04580001305	0.00000195979
Poligon2	Bakara Empat		Pemukaaan dan Tempoa Fagaa			GA0040		0.00570362902	0.00000138673

To display the selection of map data for settlements in the city of Medan as follows:

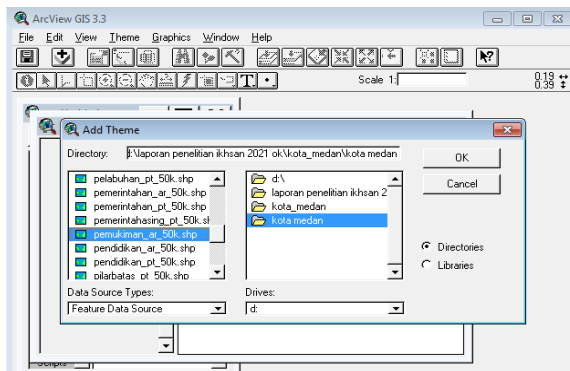


Fig 3. Medan City Settlement Data Input Display

Medan city settlement map can be seen in the following picture: Medan City Settlement :

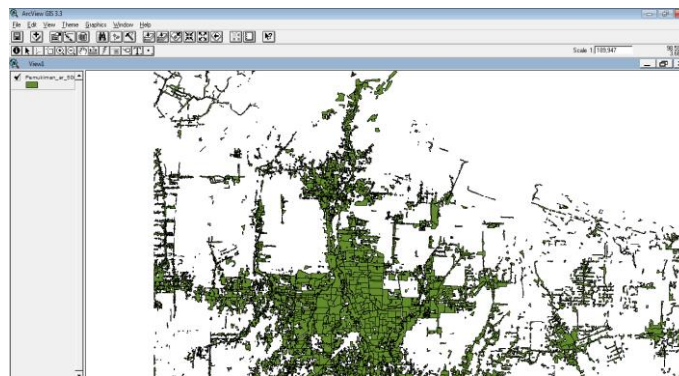
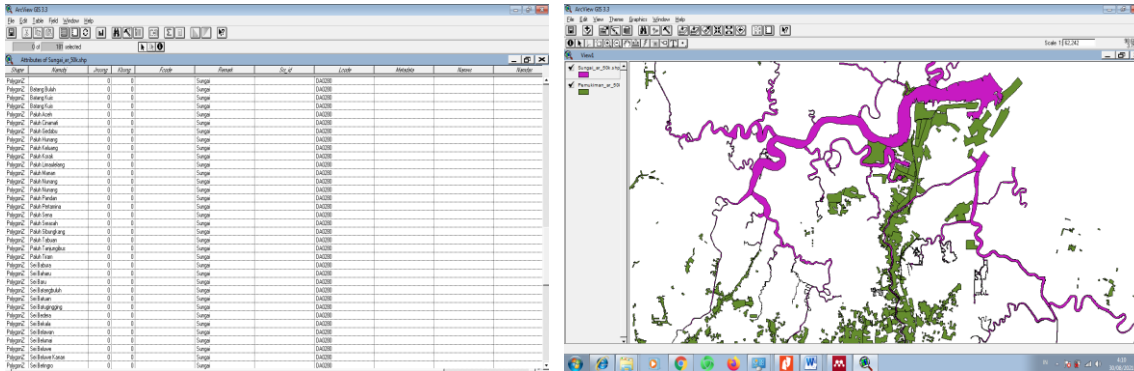


Fig 4. Medan City Settlement Map Display

Likewise, river data collection in Medan City, due to the influence of water level, location, surface area greatly affects the capacity of river overflow in case of heavy rain.



a b
Fig 5. River Data Display and Medan City River View Map

3. Research Results and Discussion

The display of flood disaster data is obtained, the mapping system is used to provide points of flood-prone areas in areas in the city of Medan.

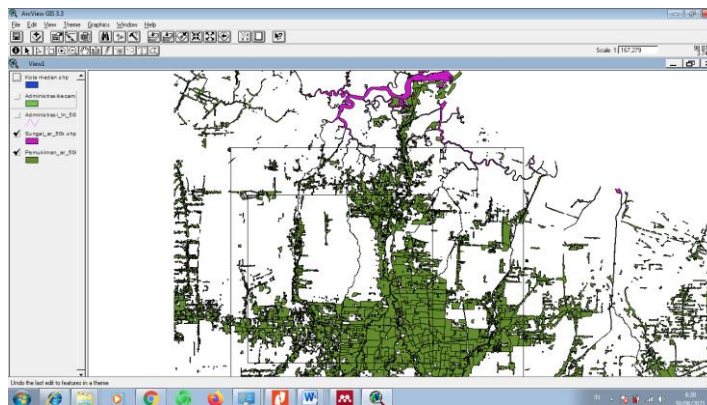


Fig 6. Display of Flood data processing results

Natural disaster-prone areas are areas that are prone to landslides, to identify areas that are prone to disasters, buffer operations are carried out to identify and analyze areas around the area within the radius of disasters that can occur in several areas [1]. Landslide map analysis consists of Soil Type Area, Rainfall Area, Slope Area, Landslide Potential Area

Table 2. Landslide Potential Areas based on Soil Stability Value

Landslide Potential Area	large (Km2)	Percentage (%)	Number of Landslides	Landslide Occurrence Percentage (%)
Stable (No potential)	461.8	57.8	0	0
Low	174.3	21.8	0	0
Currently	16.1	2.0	8	42.1
High	146.5	18.3	11	57.9
Sum	798.7	100	19	100



Table 3. Scoring Value of Slope Slope Class (%)

Slope	Slope Clarification	Scoring Score
0-8%	flat	5
8-15	sloping	4
15-25	Wavy	3
25-45	Steep	2
>45	Very Steep	1

After scoring, a map for the slope is made, The input data is then processed using the Arcview 3.3 application for mapping land slope and rainfall.

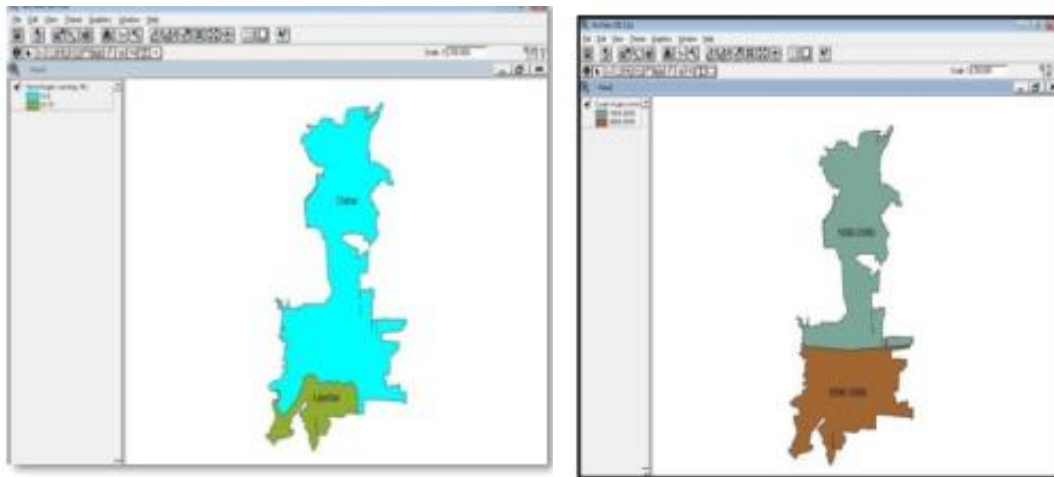


Fig 10. Map of Land Slope and Rainfall in Medan City

4. Conclusion

The results of the analysis in the discussion the author draws several conclusions Area Mapping Floods, landslides in several parts of Indonesia are used to predict and overcome if a disaster occurs The input of data and the making of a landslide disaster map must be in accordance with the data in the Disaster Area Data, The use of spatial data is very much needed for input data in the form of Shape for mapping accuracy.

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