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Flood Hazard In Hyderabad

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Abstract— Flood is a phenomenon occurring from time to time in all rivers. An attempt has been made in this research paper to demarcate the flood hazard prone areas in the Hyderabad, taken kukatpally as the study which is very low lying topography and necessary methods are being adopted by using Geographic Information System, which is used in the collection of management, maintenance, manipulation and presentation of geographic data and or information for the use of these technologies is known to simplify decision making to a non-technical level and to support the stakeholders in sustainable-oriented decision making.

Key Words: *Flood problems, Flooding zones, Hut damages, Agriculture damages, etc.*

I. INTRODUCTION

Flood is a natural phenomenon occurring in all rivers and drainage systems, which damages the lives, natural resources and environment. Recurring flood losses have handicapped the economic development of the countries.

Heavy rainfall like NISHA has thrown normal life out of gear with many low-lying areas flooded in Cuddlier, Thiruvarur, Chidambaram, Karur and neigbouring areas.
The main problems encountered in papanasamtaluk with respect to floods are, drainage congestion due to urbanization and bank erosion. The problem is based on the river system, topography of the place and flow phenomenon. The impact of floods are divided into five zones of flooding, viz. (a) Very low, (b) Low, (c) Moderate, (d) High (e) Very high.
Floods are the most common natural calamities that the whole world has been facing almost every year in varying parameters. This leads damages to property and miseries caused due to destruction of basic, civic amentias as a result of floods.

A. Types of Floods

There are mainly three types of floods

- Coastal (Surge Flood)
- Fluvial (River Flood)
- Pluvial (Surface Flood)

II. COASTAL (SURGE FLOOD)

It occurs in areas that lie on the coast of a sea, ocean, or other large body of open water. It is typically the result of extreme tidal conditions caused by severe weather. Storm surge produced when high winds from hurricanes and other storms push water on shore is the leading cause of coastal flooding and often the greatest threat associated with a tropical storm. In this flood, water overflows low-lying land and also causes devastating loss of life and property.

Coastal flooding is categorized in three levels:

Minor: there will be a slight movement of water at the place of beach and no damage is created by this minor flood.

Moderate: This moderate flood in beach erosion will occur as well as damage to some homes and businesses.

Major: Serious threat to life and property. Major beach erosion will occur, numerous roads will be flooded, and many structures will be damaged. Citizens should review safety precautions and prepare to evacuate if necessary.

Fig -1: Coastal flooding caused by Hurricane Sandy ravaged the Hyderabad.

The coastal flood is classified by different factors like strength, size, speed, and direction of the storm. The onshore and offshore topography also plays an important role. To find the magnitude and probability the coastal models flood considers the information to get a data from historical storms that affected the areas, as well as the density of nearby development.

III. FLUVIAL (RIVER FLOOD)

This happens at excessive rainfall over an extended period of time causes a river to exceed its capacity. It can also caused by melting of Ice Mountains.

There are two main types of river flooding:

Overbank flooding occurs when water raises overflows over the edges of a river or stream. This is the most common and can occur in any size channel — from small streams to huge rivers.

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Flash flooding is classified by an intense, high velocity torrent of water that occurs in an existing river channel with little to no notice. There are very dangerous and creates more damages because of the force of water.

The severity of a river flood is classified by the quantity of precipitation in an area, how long it takes for precipitation to accumulate, previous saturation the soil, and terrain surrounding the river system. In flatter areas, floodwater tends to rise more slowly and be shallower, and it often remains for days. In mountainous areas, floods can occur within no time after a heavy rain. To find the probability of river flooding the models consider past precipitation, forecasted and do some kind of precipitation for the current river levels, and temperatures.

IV. PLUVIAL (SURFACE FLOOD)

A surface water flood, is caused by a heavy rainfall creates a flood which overflowing water body. One of the most common misconceptions about flood risk is that one must be located near a water body to be at risk.

There are two common types of pluvial flooding:

Intense rain saturates an urban drainage system. The system becomes overflowed and water flows out into streets and nearby structures.

Run-off from rain falling on hillsides that is unable to intake the water.

It is the combination of both the flood of coastal and fluvial and pluvial flood only damages few centimeters deep.

V. STUDY AREA

Hyderabad is the capital of Telangana. This has 650 square kilometers (250 sq miles) along the Musi River. At an average altitude of 542 meters (1,778 ft), much of Hyderabad is situated on hilly terrain around artificial lakes, including Husain Sagar—predating the city's founding—north of the city Centre.

A. The co-ordinates are

X_{Min}=78.25 Y_{Min}=17.25
X_{Max}=78.5 Y_{Max}=17.5

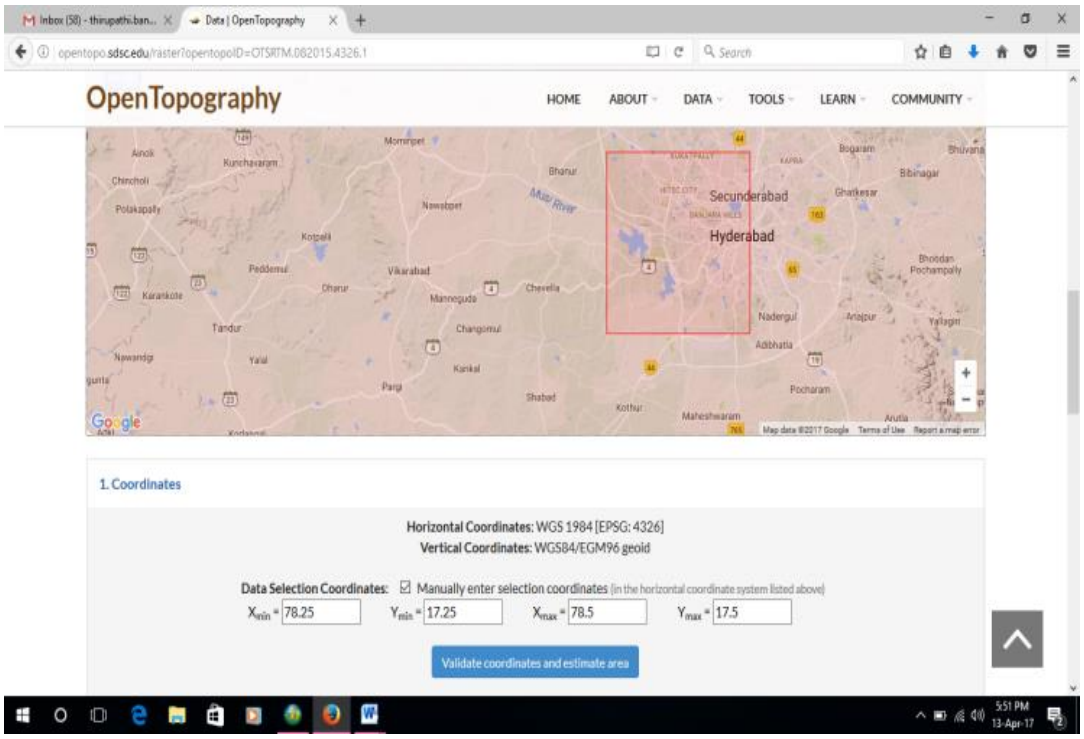

FIG -2: Location of Hyderabad in Toposheet

Download the DEM file with the above area, to see the image open Arc Map from the programs in start button. To add the DEM file to the Arc Map, use Add data tool from the standard tool bar (+) and go to the location of file and add. We can see the DEM file in Arc Map. This will be used to create the required features of interest.

Toposheet was attached and geo-referenced to get the exact location. This will help us to identify the features properly. Create the required data we use DEM file and Hydrology tools from the Arc Tool box. These tools will be accessed if selection of the customize – extensions is chosen.

The Conversion toolbox contains tools that convert data between various formats like conversion of tin to raster and shows the surface raster data, it is used to keep the required data stream lines and the contour lines on the map by using the surface tool box and the change in elevation between one contour and the next contour interval. The resultant queried contour lines are shown below, which will be used to find the

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flow direction and path with storage area. Contours generated map with 5 units' height between contours to contour.

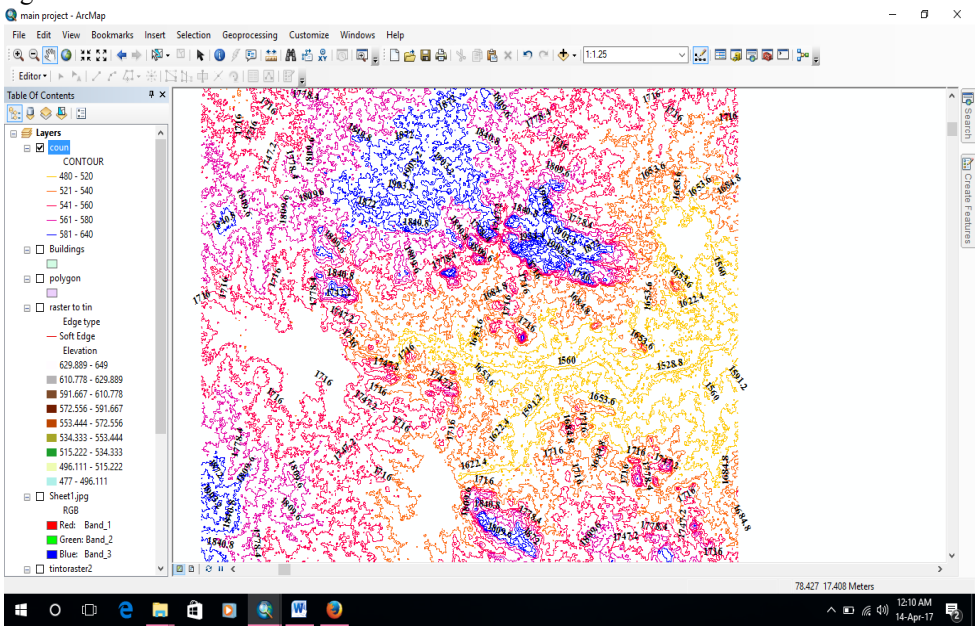

FIG -3: Result of the study area

VI. RESULT

The results are changing according to the quantity of rail fall like 5cm, 10cm; 15cm etc. in the Hyderabad city individual area are folded with the water of rain fall for small quantity of rain fall and in some areas the flood is occurring due to the heavy rain fall. But the damage is increasing with the quantity of rain hall in the Hyderabad city. Our study case show some examples like:

If there is a 5 cm rain fall in Hyderabad city some affected area are falling between Koti and Malakpet. The remaining all areas are safe.

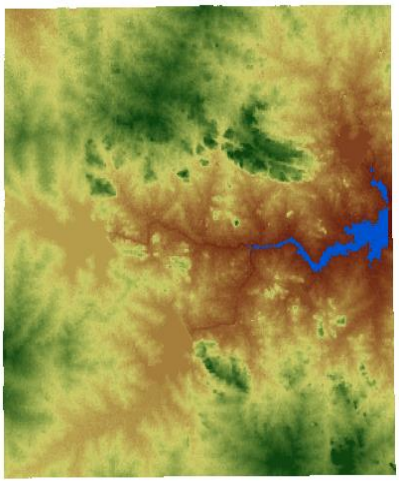

FIG -4: Rain fall of 5cm in Hyderabad areas

If there is a 10 cm rain fall in Hyderabad city some affected area are falling between Jam bagh and Dharushifa. The remaining all areas are safe in my study area.

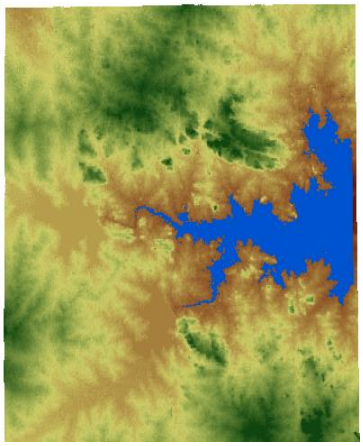

FIG -5: Rain fall of 10cm in Hyderabad areas

If there is a 15 cm rain fall in the Hyderabad city some effected area are falling between Begam Bazar and Jhansi Bazar. The remaining all areas are safe in my study area.

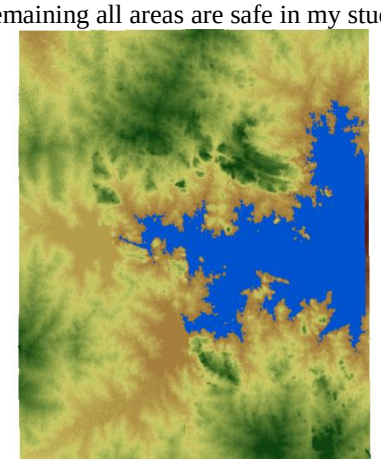

FIG -6: Rain fall of 15cm in Hyderabad areas

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If there is a 20 cm rain fall in Hyderabad city some affected area is shown above which is falling between Rahim Pura and bharahgali. The remaining all areas are safe in my study area.

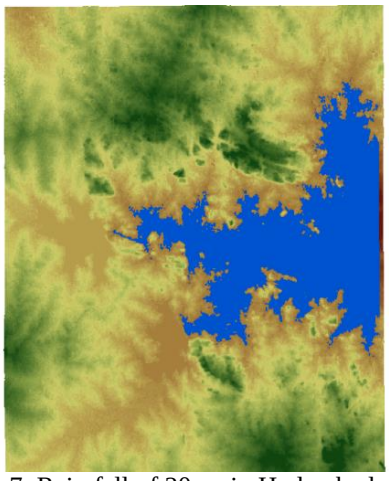

FIG -7: Rain fall of 20cm in Hyderabad areas

If there is 25 cm rain fall in the city then some affected area are falling between Himayath Sagar and Kistampure. The remaining all areas are safe.
If there is 30 cm rain fall in city then some affected area are falling between Hakim Pura and BhadraPura. The remaining all areas are safe.
35 cm rain fall the affected areas are falling between bangaliguda and narkuda. The remaining all areas are safe.
40 cm rain fall the affected areas are falling between AzzaNagar and Kothwalguda. The remaining all areas are safe.

The more damage causes due to the heavy rain fall like 50cm in the city then the damage is shown by ARC GIS in 3D is

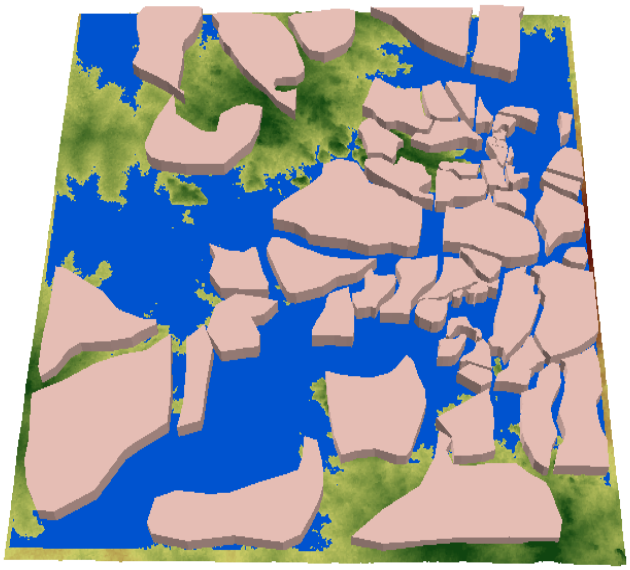

FIG -8: Rain fall of 50cm in Hyderabad area

50 cm rain fall the affected area is shown above which is falling between Kolbowidoddi and Ncaharam. The remaining all areas are safe.

A. Representation Residential And Other Lands With Legend

The different areas covered with residential and other lands. While constructing the residential we should consider the drainage system to flow the storm water freely then we can reduce the storage of water.

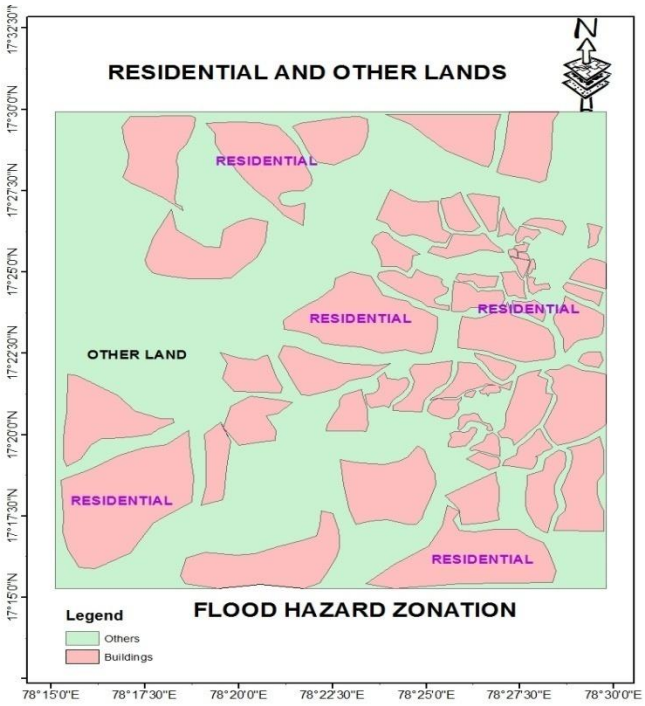

FIG -9: Representation of Residents and other land

VII. CONCLUSION

Contours are lines that connect locations of equal value in a raster dataset that represents continuous phenomena such as elevation, temperature, precipitation, pollution, or atmospheric pressure. The line features connect cells of a constant value in the input. Contour lines are generally referred to as iso lines but can also have specific terms depending on what is being measured**.** Raster surface was created to get the data as leveled surface; this surface will be used to create the contours and also can be used in the creation of 3d work. The above map represents the different areas covered with residential and other lands. While constructing the residential we should consider the drainage system to flow the storm water freely then we can reduce the storage of water
From the obtained results we found that the low level area was effecting with increased water levels and damages the area. This can be reduced by providing proper drainage system to the storm water. This water can be stored at required location and used in a proper manner like drinking and agricultural.

REFERENCES

[1]. Carstensen, L. w. and Campbell, j.B., 1991. 57(11): 1437-1446.
[2]. Mark, D. M., 1977. Vol 2, Harvard press.

ISSN No: - 2456 – 2165

[3]. Niemann K.O. and Howes D., 1991. ITC journal 91-3 pp. 127-137.
[4]. Musavi M.T., Shhrivakar, M.V, Ramanthan E. Vol.21, No 4, PP. 319- 326.
[5]. Boyell, R.L. and Ruston, H., 1963. \
[6]. Petrie G. and Kenie T.J.M (ed.), 1990, Photogrammetric Engineering and Remote sensing, 57(7): 965-971.
[7]. Sircar, j.K. and Cebrian J.A., 1986 . pp. 171-184.
[8]. Adeniyi P.O and Omojola A. (1999). Pp 143-172.