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USE OF ARC GIS & GLOBAL MAPPER IN PLANNING OF HYDRUALIC STRUCTURE

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Abstract: The present paper is based on using GIS software in a water shade management for planning of hydraulic structure. Geographic Information System (GIS) is a computer based decision making tool to plan implement and govern the object. GIS is applicable to capture, store, manipulate, analyse and visualize diverse set of spatial data. Thus we use arc GIS & Global Mapper in planning of hydraulic structure. Such software we can implement in planning of micro water shades & reservoir.
This paper attempts the calculation of storage capacity of reservoir behind the dam wall with global mapper software.

Keywords: - ARC GIS (Geographic Information System**)**, Water shade, Global map software & structures.

VI. INTRODUCTION

Watershed management means the process of creating and implementing plans, programs and project to sustain and enhance water shed functions that affect plants, and animals and human communities within watershed boundaries .water shed management is not so much about managing natural resources, but about managing human activity as it affects these resources. Effective water shade management to development can prevent community water shortages, poor water quality, flooding & erosion. The expense of under taking of water shade management is far less than the cost of future remediation. For development of agricultural & drinking water resources the basic element required are land & water. Because of tremendous rise in population, organisation, industrialization & agricultural area resulting in steep incline water demand. Indian agricultural sector is mainly depending upon the monsoon. But last 3-4 years due to in adequate rainfall, people are looking towards the underground water as a alternative source.

VII. EXISTING SYSTEM

In old days manually process was used for watershed management project. Manual process is a very complicated and time consuming & uneconomical. The person or project team has to visit that particular place or site & to collect all the various required data which is useful to design the hydraulic structure. But in this manual process data contains various human errors & instrumental error, which causes lots of problems to design such structures. Therefore it is an uneconomical process which consumes lots of time, money & human efforts.
In the manual process the first gives an overall introduction and explains what preparatory work is needed such as visit to project site, conduct survey, identification of watershed problem. The second part start with calculation of storage elevation curve, mass elevation curve for the construction of reservoir, check dams, bhandaras etc. For this process required more time as well as more manual efforts.

VIII. PROPOSED SYSTEM

Now a day by using modern software such as ARC GIS, GLOBAL MAPPER, Q GIS & new instrument such as GPS & TOTAL STATION etc. we can do this such type of project minimum time period with greater accuracy as well as economical aspect. By using above mention software we can reduce errors that are caused by human activity & environmental effects errors. This process does not require more number of field works.

Block Diagram

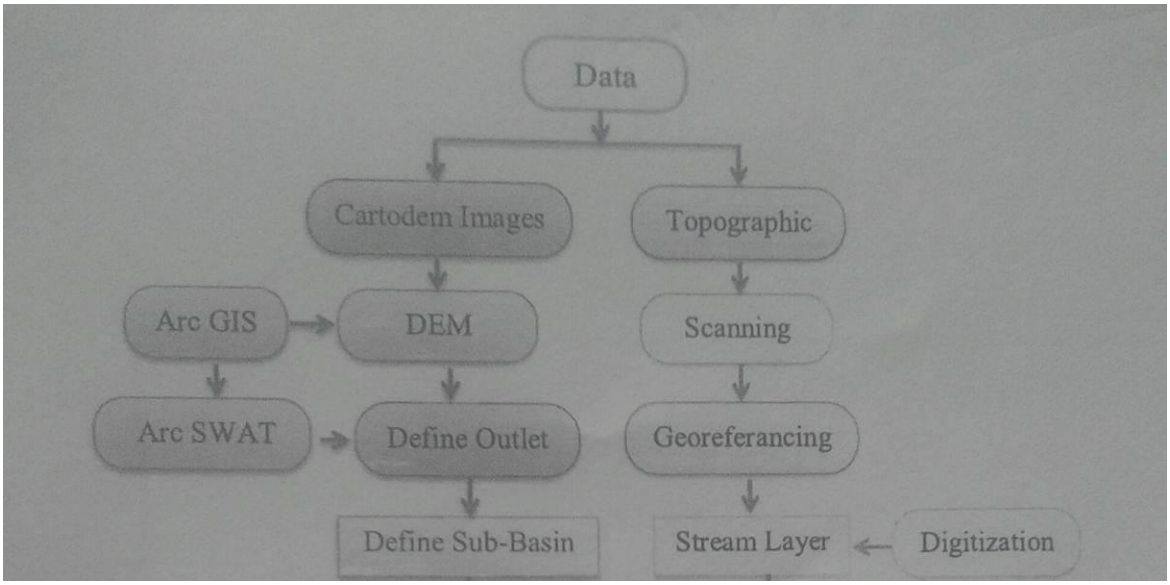
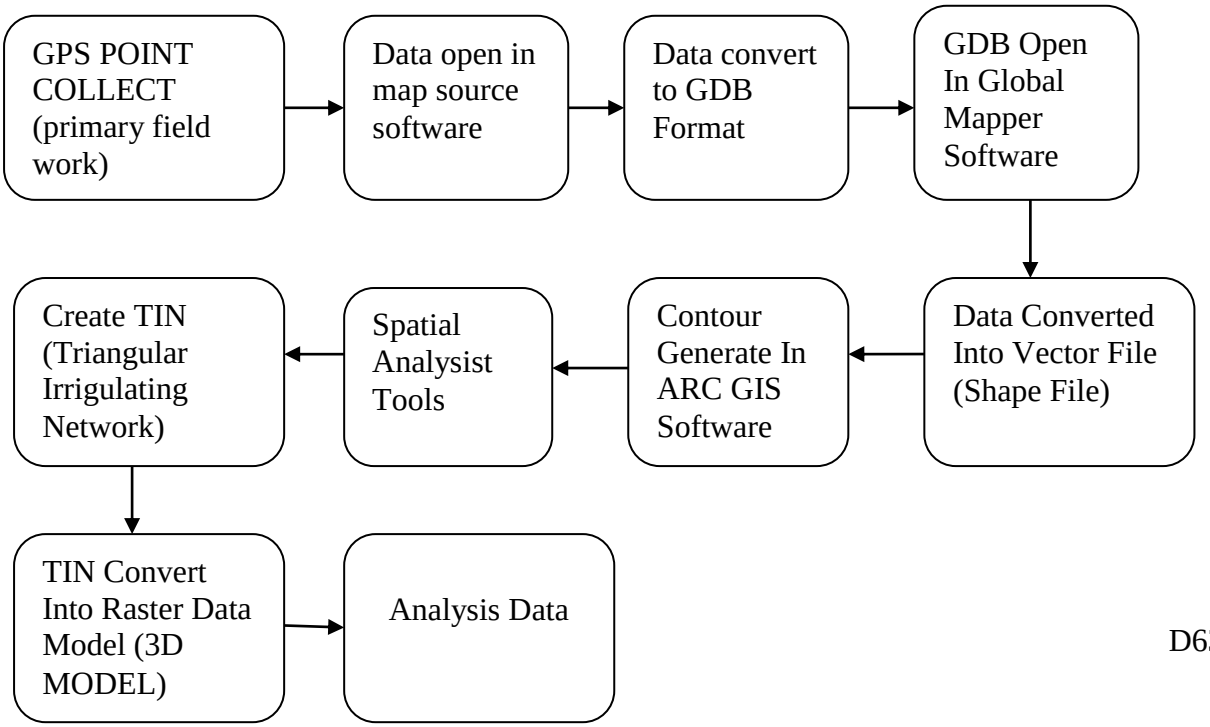


Fig 1: Block Diagram of GIS Process



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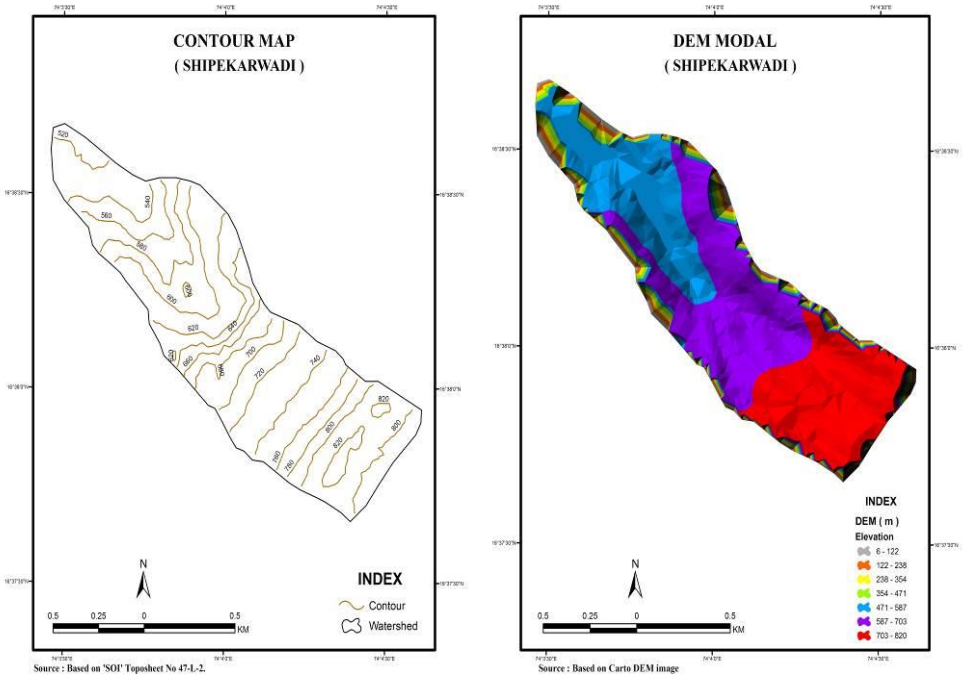
STUDY AREA:

- Shipekarwadi is a village in Karveer taluka, district Kolhapur, state Maharashtra, country India.
- Coordinates are latitude N 16 37’30” To 16 38’35” N, Longitude E 743’30” To 744’30” E.
- It Is 25 KM away from Kolhapur city.
- Area of Shipekarwadi village 204.52 hectares.
- Total population of Shipekarwadi village is 543. Male : 291 & Female : 252.
- Average Annual rainfall 1120 mm.
- Elevation / Altitude: 554 meters. Above Sea level
- Literacy rate- 68.81 %

LOCATION MAP:-



LOCATION OF SHIPEKARWADI IN KOLHAPUR DISTRICT OF MAHARASHTRA

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METHDOLOGY:-

- Software like Quantum GIS & Global Mapper proves an aid to the topographical analysis of study area.
- From the help of Indian Metrological Department (IMD) we create CARTOSAR DEM model.
- The digital elevation model provides the elevation of topography & provides topographical details.
- A Mapset file is created to process all such DEM & raster data within
- With the help of Toposheet & GPS Instrument the map of Shipekarwadi village was georeferenced to make it workable & correctly refenced with the selected co-ordinate system.
- Georeferencing actually makes the study area map or toposheet exist on world map.
- The Georefenced map can be used with the DEM to process & get desired outcomes essential for study and outcomes of the project.

Contour from RASTER EXTRACTION is used for contour formation of desired interval

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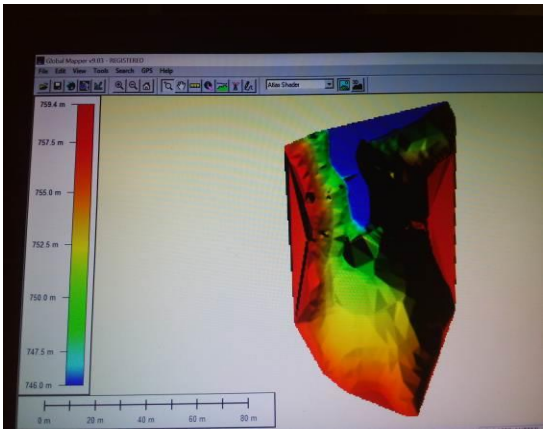

Fig. DEM IMAGE NO- 1
(Observed from upstream)

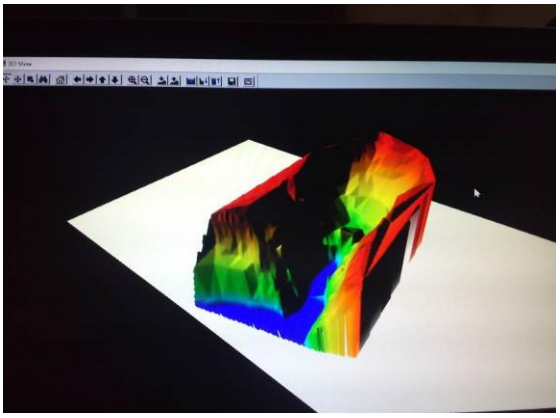

Fig. DEM IMAGE NO- 2
(Observed from downstream)

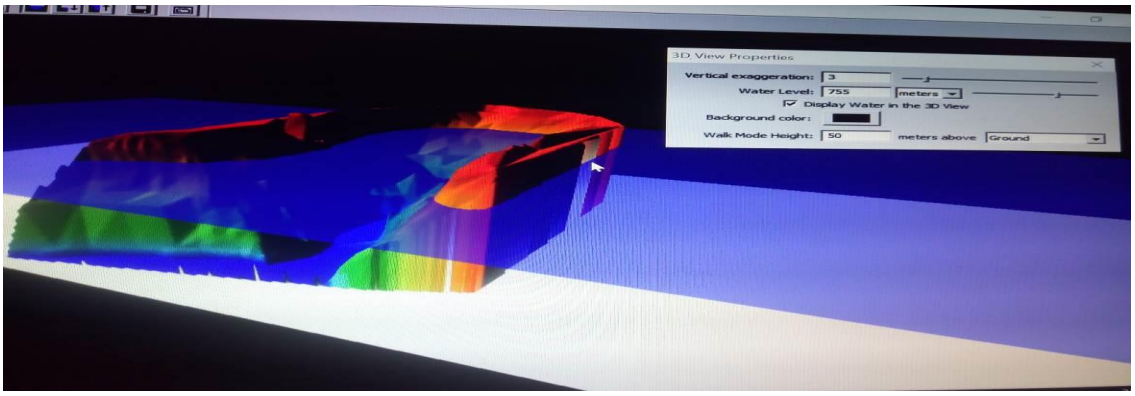

Fig. DEM IMAGE NO- 3
(Showing Water Level)

Conclusion:

- It is observed that the time, cost and efforts required in planning of hydraulic structures using global mapper is very less.
- Also the accuracy of result is reliable.
- Number of trails to change the location of dam wall and storage capacity is possible.

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