

Examining the Location's Geo-Informatics Potential for a Warehouse

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Abstract:

Assessment of the site's potential for construction Geographic information system (GIS) has become an invaluable computer-based tool in assisting a number of spatial issue activities, according to warehouse studies that focus on the current advancement of computer hardware and software. It facilitates the making of many choices by serving as a decision support system (DSS). Assessment of the site's potential for construction This warehouse study gives the current situation of the two Murabas in Barwala village, which is around 7 kilometers south of the bus terminal and on the Barwala-Sarera Road. On behalf of FCI, HAFED will issue the tender, and the business would want to make sure that the data it presents about the site's potential for warehousing development are true. One of the most important requirements for constructing a grain storage warehouse is that the location be located at a high elevation, making it safe from floods. Spot height, flood water type, and the area's contour line are needed for this reason by the company. The project's overarching goal is to facilitate reliable decision-making by furnishing all pertinent data about the research region in a timely manner. In order to make better decisions, the research provides all the necessary information on a single map, including the correct state of each piece of property. The parameters of the site appropriateness assessment for construction Regarding the flood-prone location and the placement of the several highways leading to the planned site, Warehouse places special emphasis. This research aims to identify flood-prone areas by providing information for each parcel of land using satellite data that include complete cadastral data. The study determines the best location for warehouses by using the Method of Digital Interpretation. The ground truthing survey, georeferencing, and digitizing procedures that determine whether a site is appropriate for warehouse construction are all part of a site suitability study.

Keywords:

Geo-Informatics, geospatial information systems, storage facilities

1. Introduction

Assessment of the site's potential for construction The warehouse study serves as a decision support system (DSS) to help decide if the location, which is around 2 Murabas (388,399) of Barwala village, is suitable for the building of the warehouse. On behalf of FCI, HAFED will issue the tender, and the business would want to make sure that the data it presents about the site's potential for warehousing development are true. One of the most important requirements for constructing a grain storage warehouse is that the location be located at a high elevation, making it safe from floods. Spot height, flood water type, and the area's contour line are needed for this reason by the company. Considerations for determining whether a site is suitable for a warehouse include: whether or not the area is prone to flooding; whether or not there is easy access to the site by road or rail; whether or not the surrounding vegetation and climate are suitable for storage; the parcel of land's current status and water availability; and whether or not the necessary pest control measures have been implemented.

Geo-Informatics is a field of study that builds and employs infrastructure to solve geo-science and associated technical challenges. The field of geo-informatics integrates modeling and analysis of geographic information systems with the creation of geographical databases, the design of information systems, HCI, and the use of wired and wireless networking technologies.

In all areas of warehouse construction directly related to geo-informatics, the application of geo-informatics relies on scientific and technological disciplines for sensing, modeling, representing, visualizing, monitoring, processing, and communicating.

2. Hypothesis

Geo-spatial technology may check urban land acquisition & minimizes human interruptions. By studying Temporal Urban Patterns we can identify the Past, Present and Future urban scenario and also give our suggestion about the future perspective of urban sprawl by using the present analytical technique and side by side using the traditional method of land acquisition

3. Objective

The present study has been undertaken with the following objectives.

- To provide all the required information on a single map for better decision making.
- To provide accurate status of each parcel of land.
- To provide alignment of various roads heading to the proposed site.
- To demarcate areas that are flood prone

4. Study Area

The geographic coordinates of Haryana are 74° 27' to 77° 36'E, while its latitude ranges from 27° 39' to 30° 56'N. Its total size is about 44,212 square kilometers. Ambala, Rohtak, Gurgaon, and Hisar are the four administrative divisions of the state. On National Highway No. 65, northeast of Hisar Town, at 29° 23' 0"N and 75° 55' 0"E, is the settlement of Barwala, which is part of the Hisar division. This company's property is located 7 kilometers from the bus terminal, on the south side of Barwala-Sarera Road.

5. Methodology

Study was conducted following the steps mentioned below:

1. Collection of Satellite data, toposheet and Mussavies from concern village.
2. Mosaicing of satellite data in ERDAS 9.1 software.
3. Scanning and Geo-referencing of Mussavies and toposheet with the Satellite data.
4. Visual interpretation and On Screen Digitization of Barwala village from Mussavi as well as on satellite data was done in ArcGIS 9.2.
5. Extraction of flood prone area.
6. Conducting a ground truth survey for collecting GPS points on proposed site.
7. GPS points were draped on Satellite data, toposheet as well as on Mussavies for quality assurance.
8. Find out the suitability of the site for warehouse construction.
9. Final report generation.

Data Used

- a) Cartosat-1 and Resources at P-6 LISS III satellite Images.
- b) Quick-Bird (QB) Satellite high resolution data.
- c) Toposheet from Survey of India.
- d) Mussavies from the concern Patwari.

5. 1. Digitization of Musavi:

Cadastral Map (Mussavies) of Barwala village was received from District Revenue Officer (DRO) office. The mussavies were digitized for providing murraba grid, killa grid, Killa number, Murraba number, roads, canals etc. using Arc Map/GIS Software in separate layers. Finally all these layers were merged to a single field to provide all the information in single layer. The layer is named as cadastral murraba no. The format for this layer is first three digits are Murraba number Table 1. Next there is Killa number with partition. For example **34112/1** implies Murraba number **341**, Killa number **12/1**.

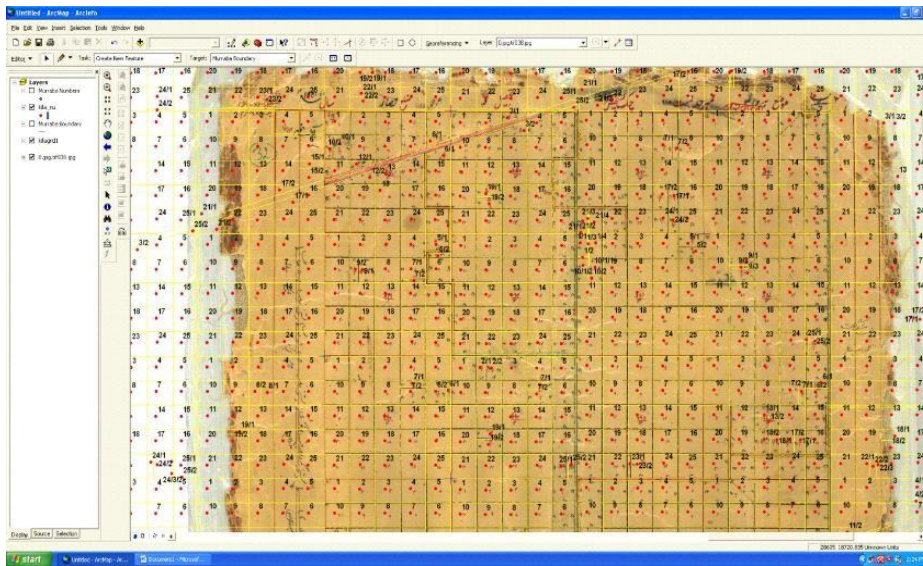


Figure 1: Digitized Mussavie of BARWALA Village

As we can see in figure2 38715/1 and 387/15/2 provides information that killa no 15 of murabba no 387 has 2 partition 15/1 and 15/2. The cadastral maps are digitized based on data of 1970. Updating given by patwari are also incorporated so that it may be found out that how much portions are updated with the time.

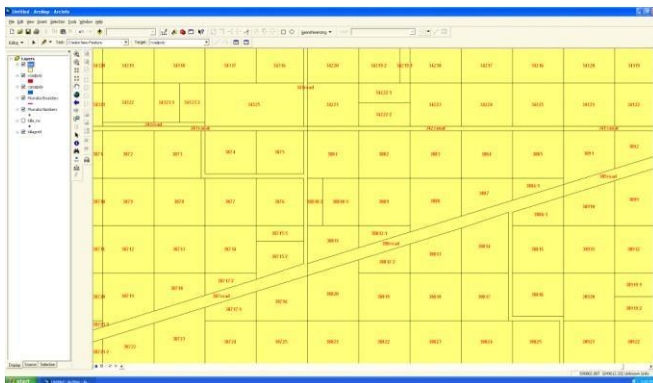


Figure 2: Cadastral layer showing Murraba number KillaNumber

After creation of cadastral data the final layer was transformed to Quickbird data of resolution 0.5 m.

The cadastral polygon exactly matches the features on the Quickbird data because of high resolution. As shown in figure 3 the layer of cadastral data exactly matches the satellite data which clearly demarcates that these required Muraba nos are suitable for constructing warehouses..

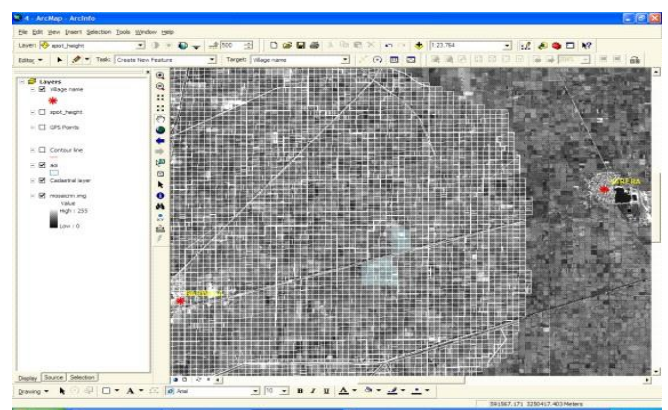


Figure 3: Cadastral data transformed to Quickbird image

In figure 4 with the help of digitization of Contour lines and spot height suitability of site can be clearly seen. In the toposheet both the features were digitized on same scale .we can see that Barwala and Sarera village road connecting them to Badhawad Distributaries where the area of interest falls.

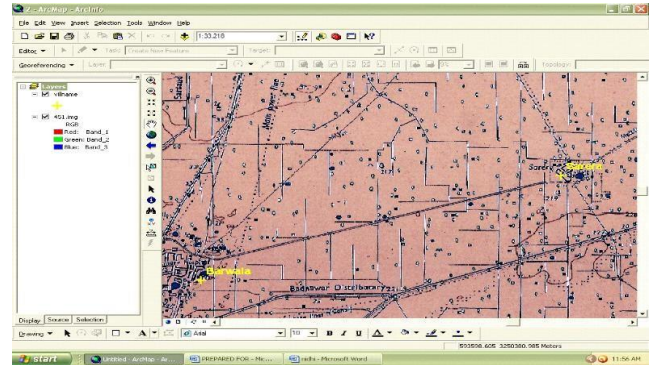


Figure 4: Toposheet O-15

5.2. Digitization of Flood Prone Area Map:

After all these processes the study requires information about the Flood prone area which can be seen in the figure 5

FLOOD AFFECTED AREAS
(CONTINUED) in 1997

Scale 1:50,000

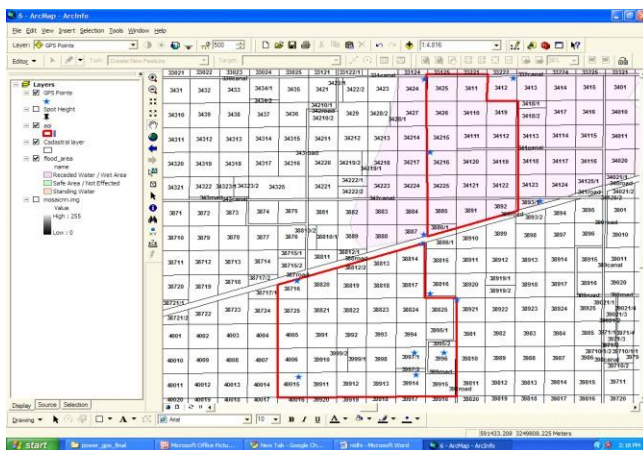
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Map Symbols

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5.3. Conducting a ground truth survey for collecting GPSpoints on proposed site



Ground truth survey was conducted for the proposed site for enhancing the quality of the study. Field checks locate the actual site on the ground based on satellite data. Cropping pattern of the particular land was also analyzed. In the survey GPS points were taken on the proposed site. Figure 7 shows GPS points that exactly drapes on satellite image.

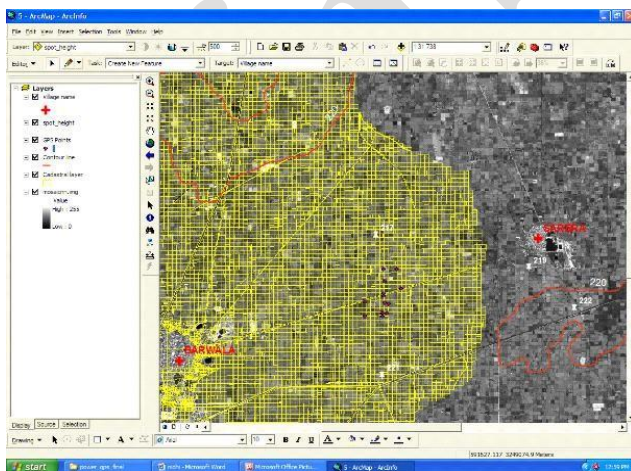
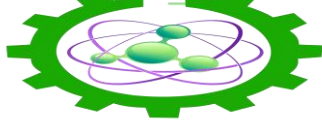


Figure 7: GPS points of area of interest



5.4. Georeferencing mussavies and satellite image inference to GPS Points:

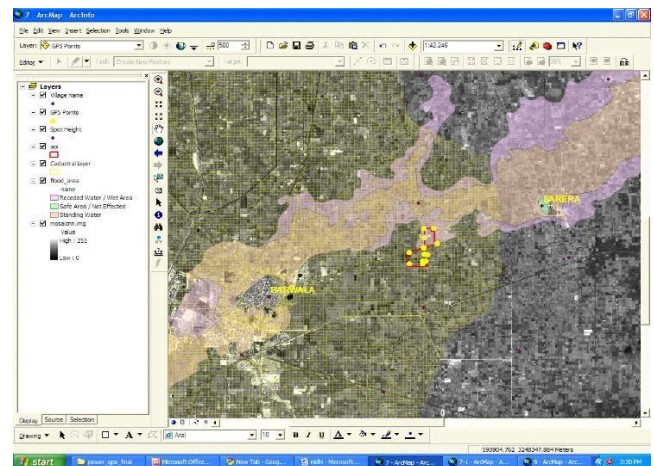


Figure 8: Flood area digitized

All the data was organized in an overlay form. After all this exercise Land SAT 1B image was opened in background of Georeferenced cadastral data. The land sat data in background shows that the vegetation (crop) in the concerned area is in good health after 8 days. The final maps were prepared and user's suggestion was taken. Accordingly the final maps were prepared on the user specification.

This exercise provide the following information to user:

- Murraba no in flood prone area.
- Status of vegetation after 8 days from flood.
- Study area is in safe zone.

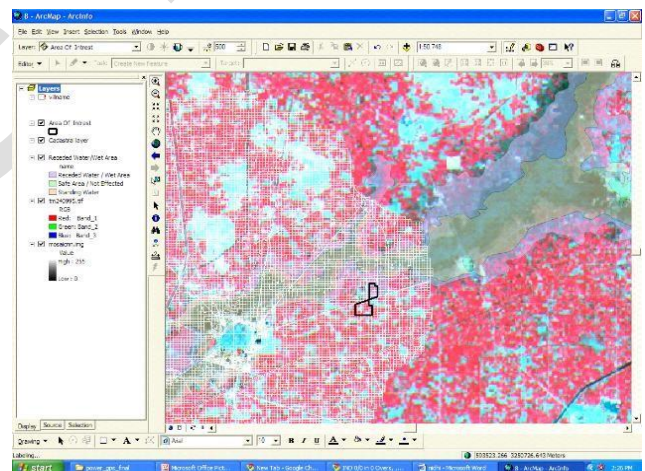


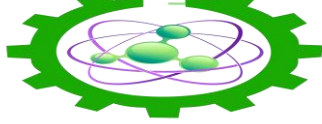
Figure 9: Land SAT 1B image in background of composed data

6. Result and Discussion

The study of Feasibility study for site suitability for building Warehouse concluded that study area of the project which lies in Killa no: 12/2,13,14,17,18,19,20,21,22,23,24,25 falls under Murraba no 388 and Killa no: 1, 2,3,4,5/1,5/2,7/1,7/2,8,9/1,9/2,10 falls under Murraba no 399 are in the safe zone. By examine the previous history from 16 September 1995 of these Murraba numbers 388,399 were found in safe zone category on 16 September 1995. The road in between these murabas acts as a barrier for flood water and

the height of road is approximate 1-2 feet. The flood water was not able to cross the road.

So by all these study it can surely be concluded that this area is highly suitable for constructing warehouses as this road in between the required area acts as a very safe part because this area and this road is on high altitude than the surrounding area. So in future if there any possibility of flood than this area is automatically safe to prevent this warehouse from flood. And beside it this road is standing as a barrier if any flood situation comes. This area is also suitable for constructing warehouses because there is good connectivity of road, availability of raw materials.



So, we can say that nobody can deny that Geo-informatics technology is emphasize on the recent development of computer hardware and software technology, Geographic information System (GIS) has emerged as a valuable computer-based tool in supporting a variety of spatial problem tasks. It acts as a decision Support System (DSS) fortaking a number of decisions.

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