

# Cadastral Reference Digital Database of Ambala District, Haryana

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**Abstract:** Ambala District has taken a lead in the modernization of land records in the state by digitizing the cadastral maps for better land management in the state. GIS (Geographical Information System) is a computer based integrated database management system that stores a large volume of spatial data along with its attribute or non-spatial data which are captured, stored, retrieved, processed and analyzed to provide answers to queries of a geographical nature as and when required. Role of GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and the geographic analysis benefits offered by maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes and planning strategies. Under the newly launched centrally sponsored program called National Land Record Modernization Programme (NLRMP), Haryana Space Application Centre (HARSAC) developed the methodology and initiated the digitization work of Cadastral Maps (Mussavies) for Ambala districts in the state, where all the mussavies have been converted into GIS format at the true to scale. Encouraged by the success of the digitization work by HARSAC, Revenue Department, Haryana, other States are also willing to implement the same methodology.

**Index Terms—** HARSAC, Digitization, NLRMP , GPS, Mussavi, ArcGIS and GIS.

## I. INTRODUCTION

The National Land Records Modernization Programme (NLRMP) is launched by Government of India in August 2008 and funded by Ministry of Rural Development, GOI, aimed to modernize the existing land records, minimize scope of land/property disputes, enhance transparency in the land records maintenance system, and to facilitate moving eventually towards guaranteed conclusive titles to immovable properties in the country. Under NLRMP entire revenue record of the state will be digitized and updated using modern GIS technology with the help of high resolution satellite imageries and GPS surveys. Haryana state has taken a lead role in the modernization of land records in country by digitizing the cadastral maps for better land management. The primary objective to provide authenticated and secure ROR ( Record of Right) services to the citizen of Haryana along with updated map of their land. The Integrated HALRIS , Bhu- Naksha is one of the very prestigious e-Governance project and complex in the nature as it provide the interface of Land Revenue Administration, property registration and linkage of textual spatial land records data in integrated manner on authenticated as well as authorization basis.

## II. Objective

- A single window to handle land records.
- The mirrorll principle, which refers to the fact that cadastral records mirror the ground reality.
- A true depiction of the ownership status, mutation is automated and automatic.
- The reference to past record is not necessary.

## III. Data Base

Information Such as Old Land Record details of mussavi, mutation, Jamabandi, Girdawri and Lal Kitab of study area and district gazetteer were collected from District Revenue Office, Municipal Corporation and statistical department of Ambala.

## IV. Jamabandi (Records Of Rights):

It is a document prepared as a part of record of right in every Revenue Estate. It contains entries regarding ownership, cultivation and up-to-date of various rights in land. it is revised every five years when a Jamabandi is prepared by Patwari and attested by revenue officer. Two copies of Revised Jamabandi are prepared. One copy is consigned to the District Record Room and other copy remains with Patwari for the current status of the settlement, presumption of truth is attached to the entries in the Jamabandi under section 44 of Punjab Land Revenue Act, 1887. All changes of rights on Land coming to the notice of the revenue Agency are reflected in the Jamabandi according to a set producer after these have been verified by revenue officer.

## V. Mutation Register

Mutation Indicates The changes that have to be brought about in ownership and title of the land. It contains the information about the Khewat of last Jamabandi, which are proposed to be corrected (column no 1 to 7) and information contained in column no 8 to 12 is proposed to be established. These columns are self explanatory. Column no. 13 indicates the types of mutation and its details. Mutation fee is entered in column no 14 and brief report is given in column no 15. Referencing of mutations are made in current Jamabandi in remarks column. At a given point of time, column no 8-12 can be taken as column of Jamabandi and confirm the title of the land.

## VI. Khasra Girdawari:

It is a register of harvest inspections. The Patwari conducts a field to field harvest inspections every six months in the month of October and March. He records facts regarding crop grown, soil classification, cultivation and capacity of the cultivators. This is valuable data and is basis for many

returns and forecasts prepared and published by director, land records, Haryana. The document is retained in custody of Patwari for a period of 12 years after which it is also to be retrieved from him and destroyed. the first six monthly inspection starting from 1st of October is called Kharif Girdawari while second from 1st of march called Rabi Girdawari. If circumstances so required, different dates in this respect can be fixed by commissioner of the divisions for any or all districts under their charge. Besides, in case of extra rabi crops such as melons and tobacco etc which cannot be observed in march, the Patwari make an extra inspection called 'Zaid Rabi Girdawari' in respect of such fields. In some cases, similar Zaid Kharif inspection is also done.

### VII. Latha (Field book)

Popularly named as shajra. Patwari keeps a copy of the shajra on cloth called 'latha'. It gives survey numbers and dimension of a field, now-a-days usually prepared on the scale 40 Karam to one inch. It is prepared at the time of settlement or consolidation. Original copy is retained in Tehsil record room and is updated every five years. Patwari's copy is kept up-to-date through field inspection and incorporation of all transfers attested from time to time.

### VIII. Lal Kitab (Village note book)

A separate note-book is maintained for each Revenue Estate wherein statistics of a village is maintained. It contains number of statements including crop grown in the estate, soil classifications, area under crops, land use, transfers in land, wells and other means of irrigation in the village and abstract of live stocks and cattle census in the village. The statements are periodically updated through harvests inspection and revision of other records which is a feed source for these statements.

### IX. Methodology

Present study has carried out for detailed analysis of old land records and related document. Scanning and Indexing of Cadastral maps, Geo-Referencing and Digitization of Land Parcels using existing Mussavi, integration of Mussavi with the ROR Data. DGPS survey and Monumentation of control points. Ortho-rectification of Stereo Satellite Images. The study is based on field survey, secondary data and GIS related data. First of all collection of village maps, cleaning correction of maps, scanning of village maps, check prints, conversion of village map or mussavi of scanned map to vector format, Digitization of map on screen, digitization Q.C., check prints and Converted into standard format. The processed data is cartographically represented by maps prepared in Arc GIS 9.3.1, Desktop editor and Arc Info. AutoCAD map 2000i is also used for map digitization.

### X. Process Of Digitization

In Digitization, the scanned maps are converted from raster to vector using GIS software. The digitized data of each feature is assigned appropriate feature code and symbols

finally resulting to the arrangement of data as per layering scheme.

### Digitization of Mussavi

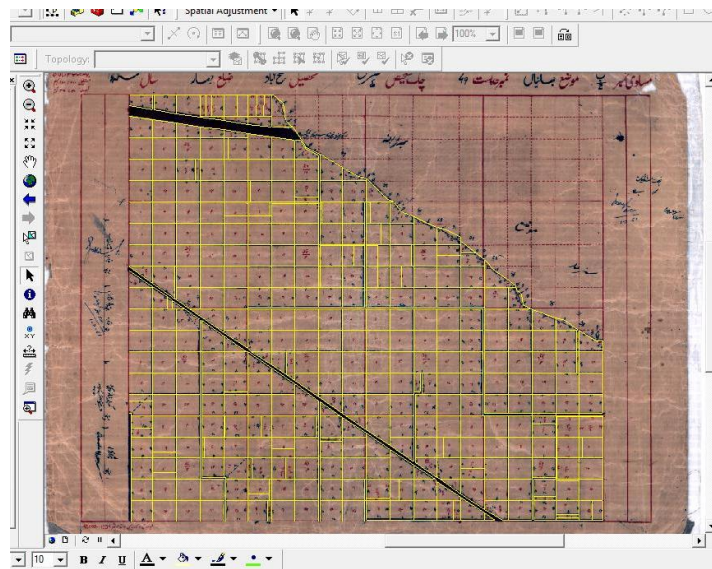


Figure 1

Next classify the line features, point and polygon features. Then create the polygons and edit/remove the errors like undershoot/overshoot and duplicate lines.

### Application for ROR Integration

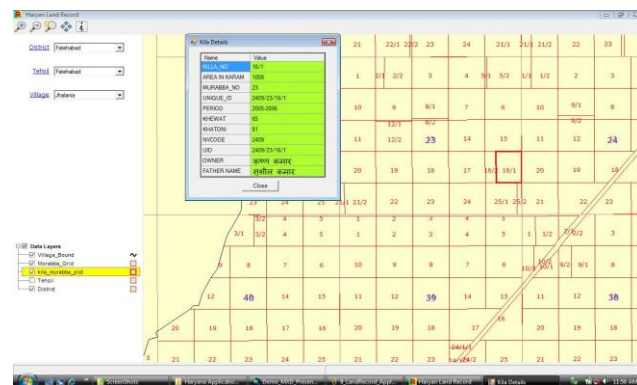


Figure 2

Use appropriate symbology to represent the topographical features on maps and convert individual vectorized sheets into .shp format and then use the process of Topology. Manual checking by Revenue Staff matching each and every parcel. The Corrections and quality standards also finalized. After that Integrate database containing the spatial data base for the map for data integration of non spatial data like plot numbers, area and every land parcel. After the data conversion ,the converted data is be checked for compliance of specification, completeness of conversion and accuracy of converted data. This check is carried out with a check list and any discrepancies if found is marked and corrected. After that an independent quality check is

carried out to eliminate chances of human error and to ensure that quality of the data conversion is as per specification.

## XI. Issues/Problems

There are some problem are also in digitization of cadastral mapping The old revenue map is not in good condition. There is a problem in scanning of this map. In some villages of Ambala District Record of village is not properly match with vector map. there is a scale problem is also persist. some land parcel of the village is missing in a map. Area of the village not match properly. Digitized maps are sent for checking with original ones to Patwaris and sometimes this process takes time Sometimes the check prints does not match with the original maps. The same could be eliminated by using good quality for maximum accuracy. However, permissible error should also be documented. In case of poor condition of maps like torn maps, maps with heavy spots, maps with folds, etc. The original maps as available in the district office be scanned directly and changes in the maps should be implemented during Digitization process.

## XII. Conclusion

Measurement Base Digitization and Vector Registration on DGPS GCP's proved to be most accurate mean of capturing land records. Ortho-rectified High Resolution Satellite Image Shall be invaluable tool in demarcating changes in holdings, encroachments. Cadastral mapping is a large scale mapping. The aim of the study was to analyze the computerization of all land records including mutations, digitization of maps and integration of textual and spatial data, survey/re-survey and updation of all survey and settlement records including creation of original cadastral wherever necessary, computerization of registration and its integration with the land records maintenance system, development of GIS database of Revenue in the state.

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