Application of Handheld Device for Topographical Mapping in Remote Area "Bhulekh and Crop Updation in Hilly Areas"

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***Abstract* – In India land data is maintained by the revenue Department and is regularly updated by the latter as and when new data is generated at the sub-district level. Looking at the complexity and volume of land records and data collected at village level by the Revenue Functionary, usage of Hand Held device was proposed. The first device that was used by Land Record Information System was "Simputer" for data collections. The Land Records Information System attempts to cover all processes involved in Recording of Land use, Crop, Tenant and Ownership details including transfer of ownership in its scope of computerization. The Land Records Information System deploys only textual data that is not graphic or spatial. Majority of the data required for land records computerization is available in two important documents per Owner, Mutation register and Land revenue register. Through computerization of the above documents, it is possible to have up to date data and a comprehensive Land Records Information System. This database, once integrated with associated digitized map data, can form a very good base data for development of Geographical Information Systems.**

***Keywords*—Land records, Geographical information system, Digitization, Simputer.**

I. INTRODUCTION

India is primarily agrarian country. About 55% of the population of the country is dependent on agriculture and allied activities for its livelihood. 36% of the available land is irrigated and 64% of the area is rain fed. The topography of India is characterized mostly by sandy soils which do not retain water for long time. Due to inadequate availability of moisture in the soil the crop productivity is low. Due to variation in altitude and uneven contours, crop/horticultural production suffers [1].

With contemporary sciences such as GPS and image processing technology, the following could be achieved in digital/ picture form.

I. Locating boundary of the fields

II. Contour mapping

III. Measurement of soil characteristics such as soil/moisture, carbon content and nitrogen status

IV. Crop condition with respect to color and density. Including major diseases.

Thus, the system would be able to digitize the information and develop contour maps for information of the land owner. It would help in better management of land, crops, and resources .

The computerized Land Records Information System purports to include the following subsystems or functions. These cater to the various facets of effective Land Records Information System software satisfying users diverse information needs [2].

1. The Parcel and Ownership subsystem is responsible for maintaining cadastral records and existing owner related information.
2. The Mutation Subsystem captures 'Changes' in the land holdings, arising mainly due to inheritance, contracts of sale and mortgage.
3. The Report and Query subsystem is the Information Retrieval function, wherein requested information is retrieved in a user-friendly and desired format, both on screen and as a hardcopy.
4. The Maintenance subsystem comprises Options of Database Backup and Maintenance of Codes.

II. LAND ADMINISTRATION

In The Land Records Information System we have developed a module for recording all information about land records named as " Bhulekh crop updation Module" attempts to cover various processes involved in recording of land use, crop, tenant and ownership details including transfer of ownership [3]. So, this application is developed with the view that application should record crop related data using the handheld devices (simputer) anywhere and anytime.

Data collection in manual forms, rearrangement of data in different registers and generation of reports at Sub-district level is tedious and time consuming activity that a village revenue officer performs [4],[5]. To simplify this work, hand

held device is proposed to be used where the village revenue functionary will have access to a limited set of attribute data (pertaining to the villages under his jurisdiction) and can record numerous related information such as area, assessment, crop codes, source of irrigation codes, enter revenue collection etc. Public (landowners) in general will benefit from this system as they can generate copies of Record of Right (ROR) [6],[7] very quickly and accurately. Further, the second set of users that benefit, are the revenue department functionaries from sub district level to State Headquarters as data compilation, collation and transmission is quick and accurate. Further data updation, which occurs because of various transactions like sale, succession, acquisition, mortgage, etc can be done in an efficient manner and can be maintained regularly without fail and on time following figure shows the comprehensive details of land record administration [8].

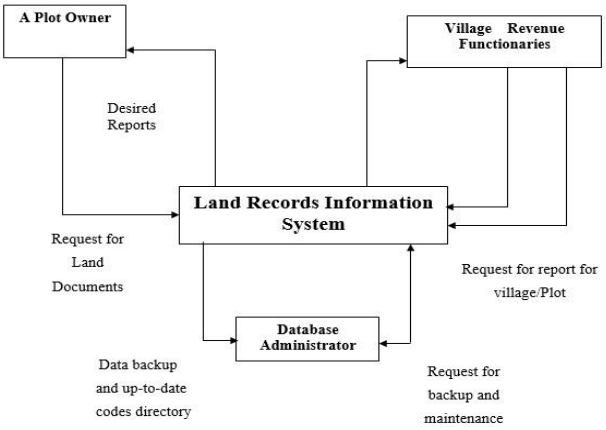

Fig. 1. Land Record Administration System

III. RELATED WORK

"BHULEKH CROP UPDATION MODULE" helps to Cater to the need of updating season-wise Crop Information of a year[8]. The village revenue functionary will be having data pertaining to his villages on his simputer [9]. During his field visits he can record the crop details (area under cultivation, source of irrigation, uncultivable land details etc), and at the end of the day he can load the data into the Sub-Division Server. Thus the data would be current and up to date [10].

The Village Revenue Functionary collects Land Related data for following important purposes

- Field Inspection for mutation
- Crop information season wise for reflection in the Record of Rights (ROR)
- Demand and Collection of various types of taxes, census, fees etc.
- Agricultural Census Data

Categorization of landholders as small, marginal and large depending on the total holding Size held by them.

This Land Records Information System attempts to cover all processes involved in recording of land use, crop, tenant and ownership details including transfer of ownership, so if any unauthorized user logs in and do some changes, which can lead to drastic results which are unrecoverable. Smart cards can be provided to the revenue functionaries for data security[11] .

So, this application is developed with the view in mind that the Land Records Information System applications should record crop related data using the handheld device Simputer anywhere and anytime [12].

Following are the advantages of system

- Data Integrity, accuracy and timeliness in Land Records Information Processing is ensured and also find out the crop details in irrigated Area and Unirrigated Area with a particular Survey number . with the help of handheld devices Simputer [13],[14].
- Using Simputer, crop related data can easily be recorded in anywhere and anytime.
- Generates Crop type summary of the village in the form of reports
- As correct and reliable data is always available, it proves useful for planning and decision-making providing to update crop details season wise at a particular Year.
- Retrieval of land records information in useful formats for decision making and planning at the Revenue Block/Revenue Circle/Sub Division /District/State level [15].
- Contributes to Agriculture Census work with up to date Crop information.
- The land reforms can be implemented effectively. We have taken some screen shot of our work by using simputer. Following are the few screenshots of working modules.

Fig. 2. Login Module

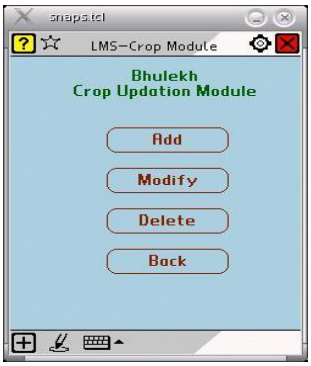

Fig. 3. Bhulekh Updation

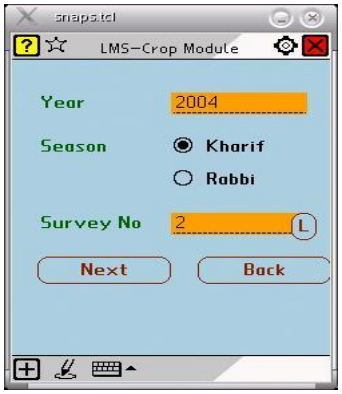

Fig. 4. Crop Updation

Fig. 5. Land Updation

IV. CONCLUSION

The present manual system working in Land Records Information Division cannot handle bulk of data. So, There is a need to computerize this process in order to save time, money, manpower, and to produce error free reports. These reports are needed for Govt. work and land management. The workload of village revenue functionary will be reduced by using computerised system.

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