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Implementation of GIS for Land Record Management

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***Abstract*—** *Land is measure of wealth, status and power. India is a predominantly an agricultural economy and now it is rapidly transforming into an industrialized economy because of which it is suffering from urban overcrowding, unlimited exploitation of precious natural resources like land are being put to enormous strain, screaming for proper management. But India do not have an efficient Land Management System which covers detailed information of each aspect. Land records maintained manually have different formats and use different terms to convey same information. Therefore, there is need to develop a uniform terminology and generalized database scheme for land records. Efficiency in land management gives the overall idea of a nation's developmental status. GIS deals with spatial data collection, storage, management, retrieval, conversion/changing, analysis, modeling, and display information about the features that make up the Earth's surface. It can decrease the cost and time of the decision makers and planners in arranging the data in reaching the accurate conclusion. GIS is a tool that can be effectively used for better visualization and spatial analysis applications.*

***Keywords*— *analysis, GIS, land, record, spatial data, query*.**

I. INTRODUCTION

Land is measure of wealth, status and power. Any developmental activity is almost can't take place without taking land into consideration. Therefore, efficiency in land management gives the overall idea of a nation's developmental status. India having 29 States and 7 Union Territories and each state has been divided into Districts and then to Villages and so on. There is Land, which belongs to Government, land which is Private Property, land which is totally unused. As population grows, infrastructure tends to grow and property value starts increasing. The family disputes in villages make more and more divisions on the land. So keeping Land Records has become a necessity. Also India is a predominantly an agricultural economy and now it is rapidly transforming into an industrialized economy because of which it is suffering from urban overcrowding, unlimited exploitation of precious natural resources like land are being put to enormous strain, screaming for proper management. But India do not have an efficient Land Management System which covers detailed information of each aspect. Due to Lack of proper land records management, poor records keeping and inefficient judiciary has resulted in a high demand of a system that keeps the accurate record of lands, Records of right ownership and makes it available in time. Land records maintained on paper or cloth has preservation, updating and retrieval problems. Computerization is natural solution for all these problems. And Geographical Information System (GIS) technology provides municipal governments with extraordinary quantitative and qualitative benefits. GIS solution is the need of the hour taking into consideration the voluminous information that needs to be made available to various decision makers in various departments. GIS tool integrates non-spatial and spatial datasets for query and better display.

II. LAND RECORD MANAGEMENT

Geographic information system (GIS) is a computer based system that deals with spatial data collection, storage, management, retrieval, conversion/changing, analysis, modeling, and display information about the features that make up the Earth's surface. It provided the potential for mapping and monitoring the spatial extent of the built environment and the associated land use/ land cover changes. Gathering of basic information is the primary step in taking the proper decision in developmental activities of the study areas. The basic information can be obtained by different methods like field surveys, aerial surveys, Census of India. The information necessary to make available all kinds of data related to the village, easily and concisely for planning at micro- level. This information system will be helpful for planners, academicians, geographers, decision makers and government officers. The emergence of Remote Sensing and Geographic Information System as a powerful tool for spatial analysis and storage has in effect alleviated the problem by computerization of the spatial data. GIS is a tool that can be effectively used for better

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visualization and spatial analysis applications. The GIS technology can decrease the cost and time of the decision makers and planners in arranging the data in reaching the accurate conclusion.

III. STUDY AREA FOR LAND RECORD MANAGEMENT

Khochivade village is located in Vasai Tehsil of Palghar district in Maharashtra, India. It is situated 3km away from sub-district headquarter Vasai. As per 2009 stats, Khochivade village is also a gram panchayat. The total geographical area of village is 149.99 hectares. Khochivade has a total population of 2,219 peoples with 50.83% males and 49.17% females. There are about 476 houses in Khochivade village.

IV. METHODOLOGY

The methodology adopted in the study can be described in the following steps.

- Collection of spatial and attribute data of khochivade village.
- Plot-wise land use map is prepared and attributes were assigned for every plot with full ownership and built-up information using grass GIS
- For case study area develop land record management model using grass GIS.
- Run queries on the model for immediate and ready extraction of information through Web.

V. INTEGRATION OF GIS MAP & SPATIAL DATA

Taluka Inspector of Land Records in Vasai Taluka keeps all the spatial data of lands. Map of Khochivade Villege of vasai taluka were provided by the Taluka inspector, which is considered for this study.

5.1 Generation of GIS Map of Study Area

The scanned copy of study region (Khochivade village). In this map, there are 81 plots.

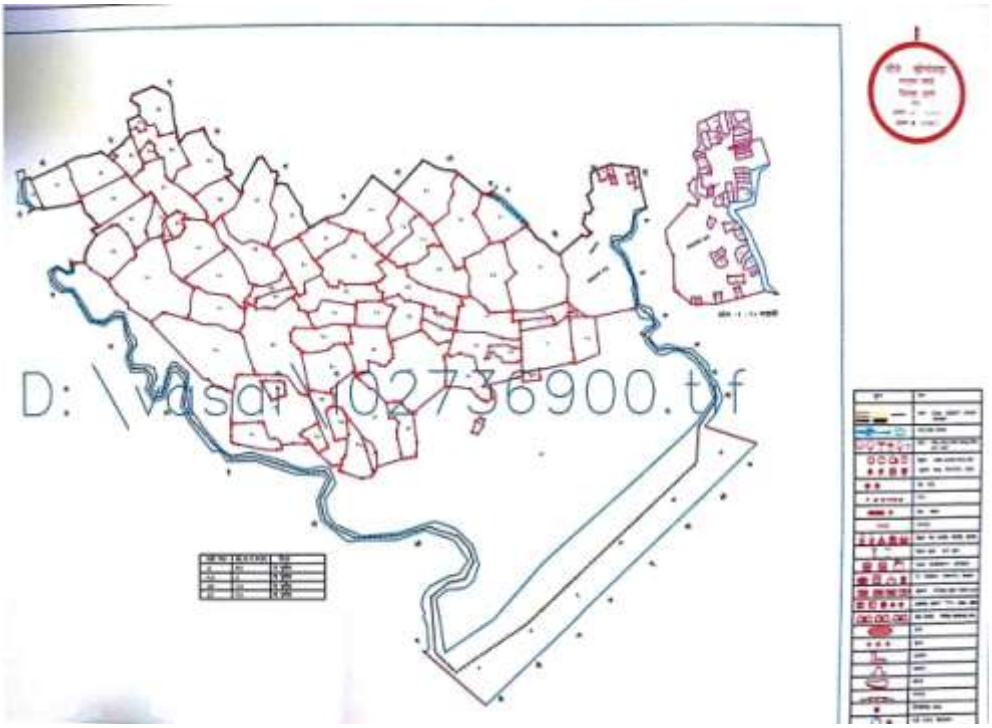

Fig. 1. Map of khochivade village

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5.2 Digitization of village Map

Khochivade Village Map is digitized in Q GIS software and then database are added. Different types of database are developed in with the help of this software. These databases are being used to run the different types of query.

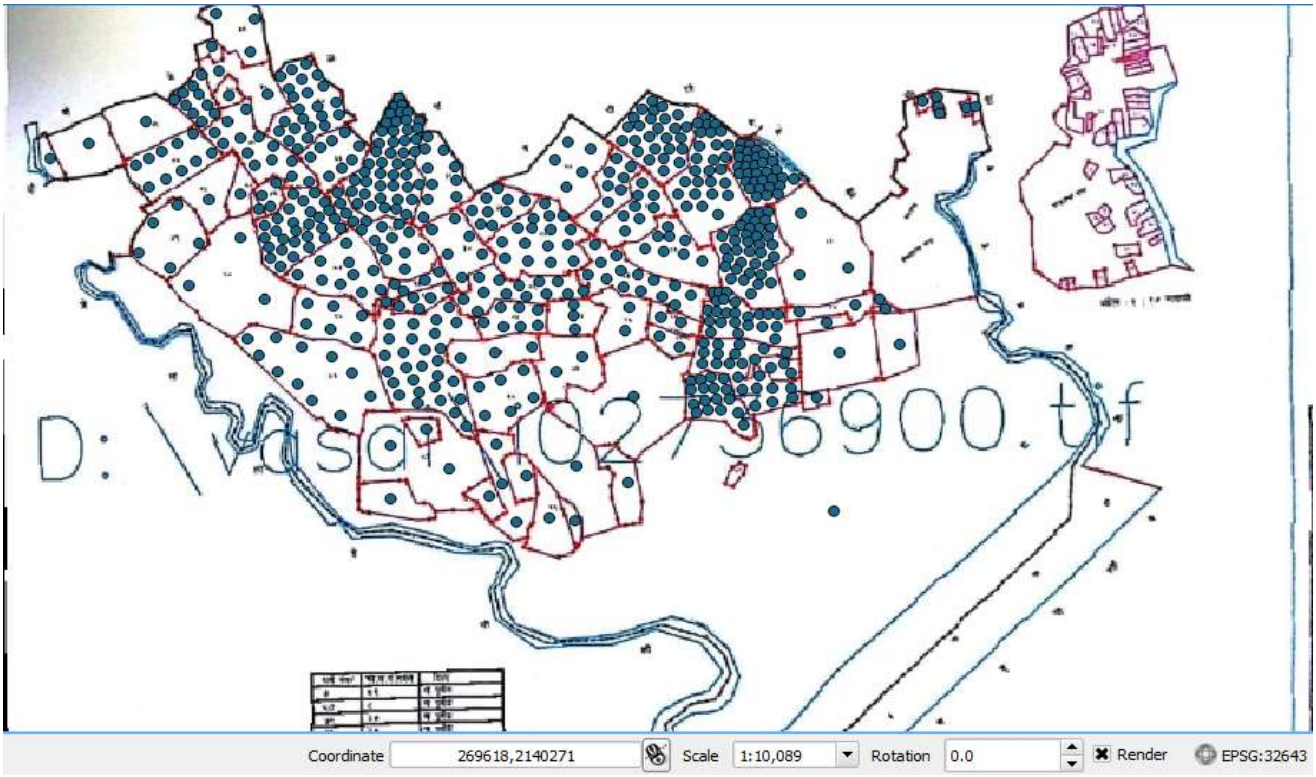

Fig.2. Plotting of survey point

5.3 Preparation of database:

The data collected for all the plots is digitized. It includes all the attribute data:

- Survey No, Sub-survey No
- Total area in acres/hectares
- Owner name
- Account book No.
- Akarani
- Name of crop
- Area of cultivation
- Hydrous, anhydrous
- Season of crop

SurNo	SubDiv	District	Taluka	Village	NameOfOwner	AccountBookNo	TotalAreaInHectre	Akarani	NonCultivable	Anhydrous	Hydrous	Zone
1	1	PALGHAR	VASAI	KHOCHIVADE	KASHINATH HIRAJI RAUT	191	7.60.00	76	0	7.60.00	0	non
2	2	PALGHAR	VASAI	KHOCHIVADE	JIVUBAI SHYAMRAV CHURI	191	0.00.00	29.1	0.05.18	0.05.18	0	non
3	3	PALGHAR	VASAI	KHOCHIVADE	JIVUBAI SHYAMRAV CHURI	191	0.01.30	0.9	0.01.30	0	0	OTHER
4	4	PALGHAR	VASAI	KHOCHIVADE	JIVUBAI SHYAMRAV CHURI	191	0.00.00	2.5	0.01.26	0	0	non
5	5	PALGHAR	VASAI	KHOCHIVADE	DEEPAK JAGGANATH RAUT	85, 429, 711, 712	1.44.34	1.42	0	0	0	non
5	5	PALGHAR	VASAI	KHOCHIVADE	NARSIH	85, 429, 711, 712	1.44.33	1.42	0	0	0	non
5	5	PALGHAR	VASAI	KHOCHIVADE	JITENDRA GANPAT RAUT	85, 429, 711, 712	1.44.33	1.42	0	0	0	non

Fig. 3. Database of all plots

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5.4 QGIS for land record management:

For better visualisation and spatial analysis GIS can be used effectively. One of the most common products of a GIS is a map. They are often the most effective means of communicating the results of the GIS process. Therefore, the GIS is usually a prolific producer of maps.

5.5 Running Queries

Queries are then run to get the desired information from the database. GIS applications are tools that that enable clients to create interactive queries, analyze spatial information and present the results of all these operations. Different Queries will be run in QGIS after integrating with the spatial and attributes data. The yields of different inquiries keep running in the Vector Analysis Module of QGIS are appeared as follows:

- Query 1: Show Plots whose sub survey no is 12-13

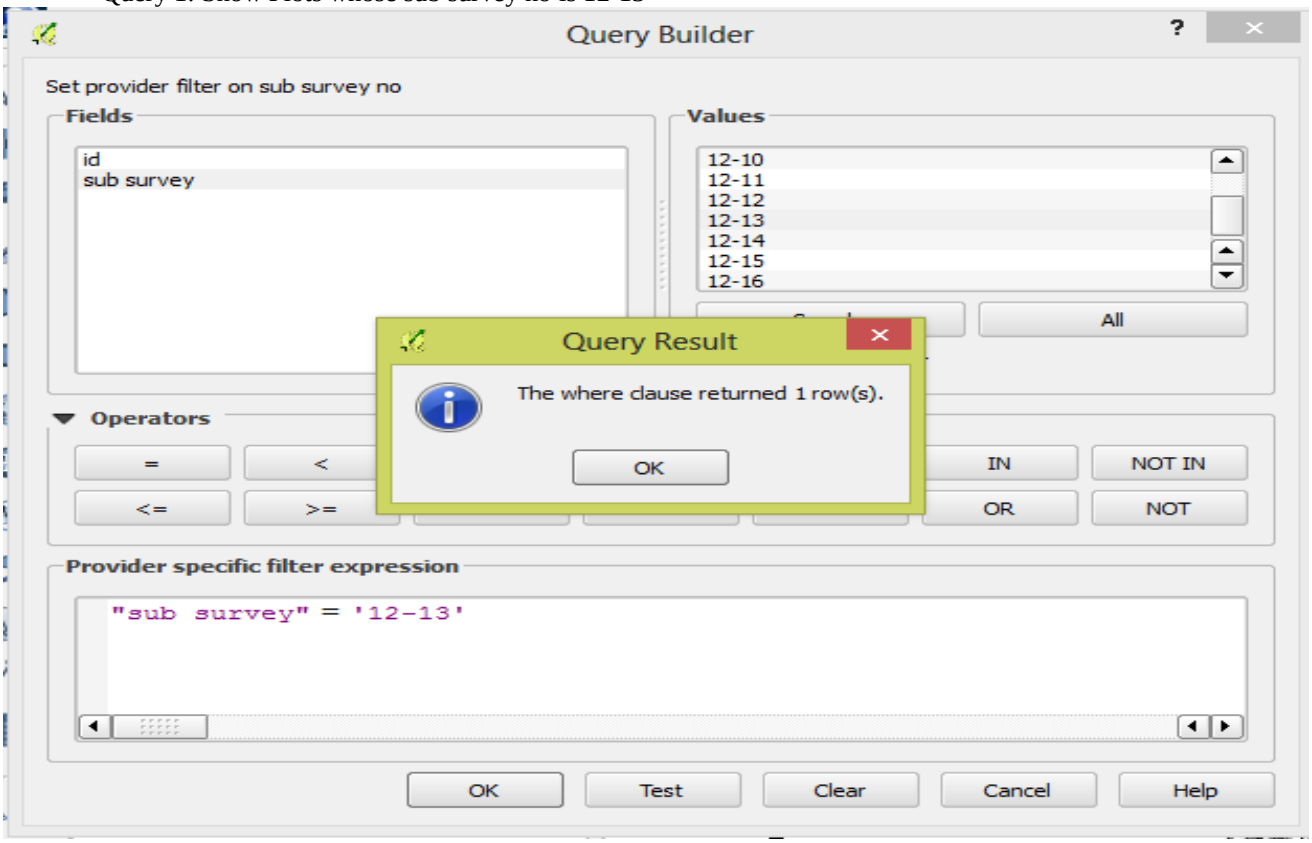

Fig.4 query 1.

Utility: From this query, all the plots recorded whose sub survey no 12-13 can be identified. Attributes related to the plot like, owner of the land, area, location, taxation details etc. can be collected. Therefore, it becomes easier for land records department to handle the records of land.

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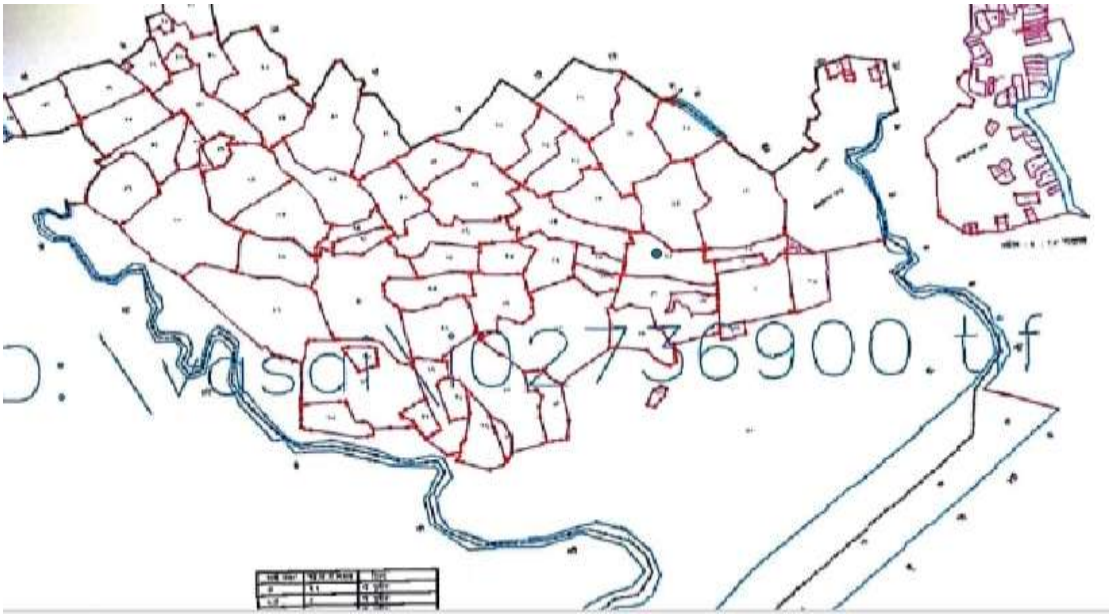

Fig.5. map showing result of query 1

- Query 2:Show Plots whose owner name is aasha jaganath raut.

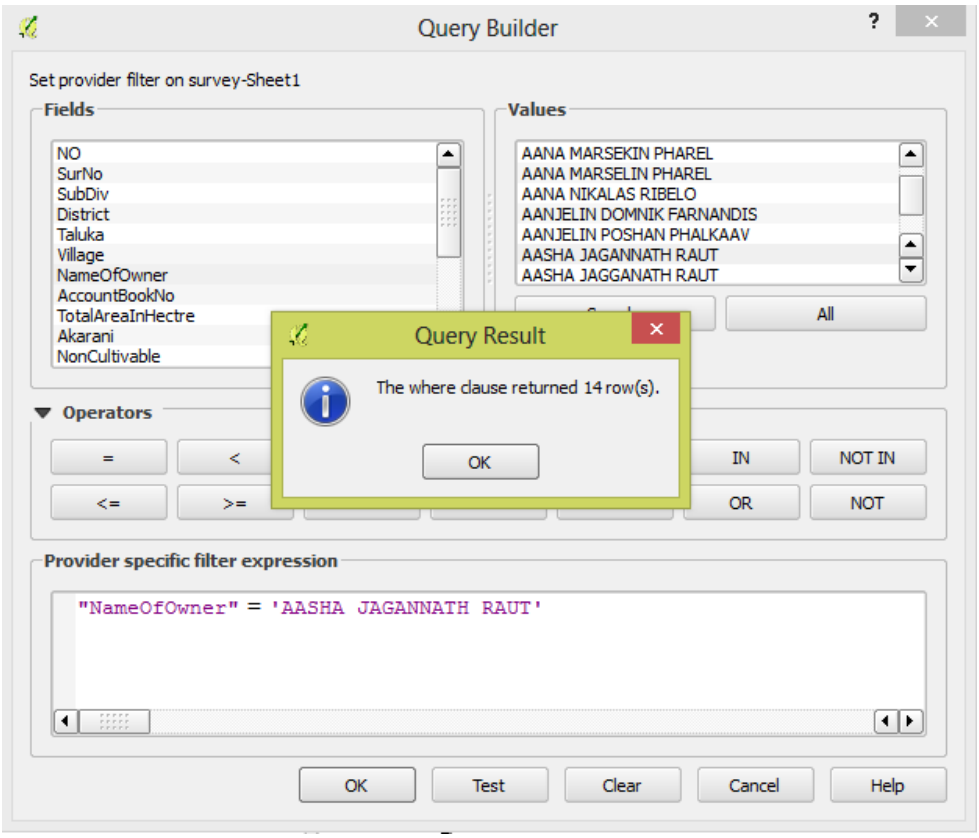

Fig. 6. Result of query 2

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Utility: From this query, all the plots recorded whose owner name aasha jaganath raut can be identified. Attributes related to the plot like, owner of the land, area, location, taxation details etc. can be collected. Therefore, it becomes easier for land records department to handle the records of land.

VI. CONCLUSION

In this paper, an adaptable and easy to understand data framework on GIS stage utilizing QGIS programming was produced to help planners, administrators, land managers and common public for village level planning with reference to managing the records the lands of Khochivade village. Development of GIS model included digitization and geo referencing of village map, extensive survey and interaction on ground in order to obtain attribute data, integration of the geo referenced map with the attribute data and its application in land records management by running various queries. The study has brought out the inherent advantages that a GIS platform offers in management of land records system over the present unautomated methods. Timely and easy access to accurate information on land records will facilitate easier, faster and more effective decision making. It will benefit all the stake holders including land owners, planners, policy makers and land administrators by the improved, effective and efficient methodology of land records management offered by GIS platform. One of the major limitations in preparation of such GIS models is the extensive attribute data that need to be converted for integration into the GIS platform. Moreover, regular updating needs to be carried out at stipulated intervals on regular basis to keep the data updated. A certain degree of expertise needs to be acquired in the handling staff in order to understand the operating procedures of QGIS so that they can operate the GIS models as per their requirement.

REFERENCES

[1] Vinay Thakur,Ganesh Khadanga, D.S Venkatesh, Dr D.R Shukla,"Land management system in India -Past, present and future",(2000).

[2] M. Ahadnejad-e-Reveshti, "Evaluation and Monitoring Annually Changes of Agricultural Cadastre Map Using GIS Techniques A case study in khosheh Mehre agricultural lands" Northwestern Iran , (2003

[3] Alok Sharma, Navdeep Kaur,"GIS, GPS & Land Information System", (2000).

[4] B.A .U.I.Kumara,"Application of Participatory GIS for Rural Community Development and Local Level Spatial Planning System in Sri Lanka", (2007).

[5] Singh, R. M. and Trivedi, R.K.,"New trends of digital cartography in cadastral mapping with special reference to remote sensing and GIS applications", 25th INCA Congress, Indian National Cartographic Association, India , (2005)

[6] B. Sarma, Buragohain, S., Dhanunjaya Reddy, Y., Venkata Rao, B., Gohain,M.,"Development of a Web Based Land Information System (LIS) using Integrated Remote Sensing and GIS Technology for Guwahati City, India" Map Asia Conference, (2003).

[7] Yuvraj M. Patil, "GIS based land record management system" (IJIRSE) International Journal of Innovative Research in Science & Engineering.

[8] Subash S. & Arjun Padaki "Enterprise GIS for Municipalities – An Integrated Approach" Map India Conference, (2003).