

Geographic Information System (GIS) for Natural Resources Management in Rural Areas:-

A Case Study of Village Jeeda, Block Goniana, District Bathinda (Punjab)

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Abstract:- Geographic Information System is a computer based tool for marking specific Places on maps. It is a collection of map systems, geographic datum and human knowledge makes it possible to present the geography around us with the aid of digital technology. We have collected locations of Work Sites using Google Earth Android Application and Sharing Locations on WhatsApp Messenger.

We have selected Village Jeeda in District Bathinda(Punjab) for GIS planning of Works which are to be executed under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).

Works related to Natural Resource Management such as Plantation, Renovation of Community Ponds, Maintenance of existing plantation, Irrigation Water

Channels Maintenance etc. Block plantation, Ponds are marked with Polygons attributes and Line Plantation, Irrigation Water Channels are marked with paths attributes.

GIS has a wide range of applications. It is equally important in Natural Resource Management. The GIS in Natural Resource Management is a resourceful technique in measuring natural resource assets.

I. HISTORY OF GIS

In 1832, French Geographer Charles Picquet created a map based representation of Cholera Epidemiology in Paris by representing 48 districts of Paris with different halftone colour gradients, which could be classed as GIS.

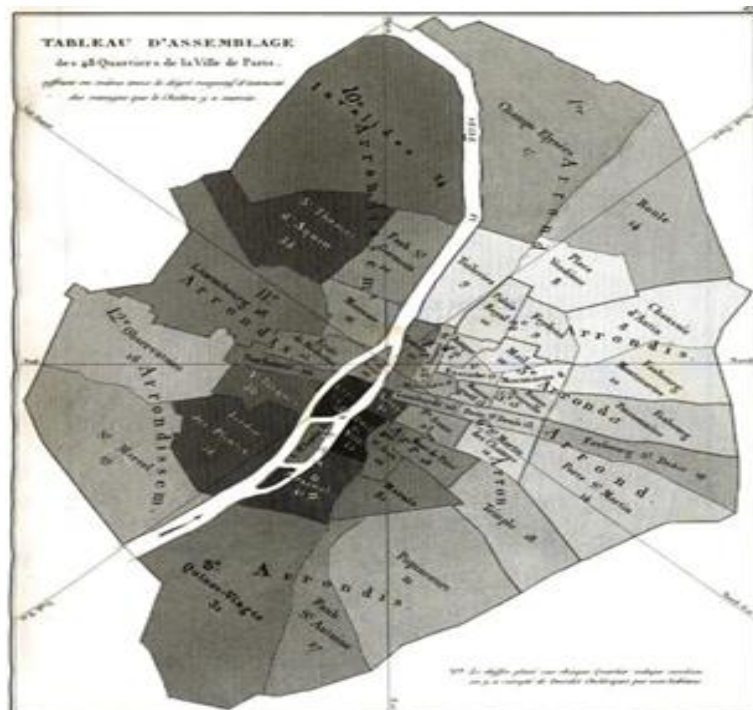


Fig. 1 Charles Picquet's Plan

In 1854, British Physician John Snow began paper mapping of Cholera Outbreak locations, property boundaries, water lines in London, England. From that paper mapping he concluded that cholera cases were commonly

found near water lines. The work of Dr. John Snow demonstrated that GIS is a problem solving tool. He put geographic layers on paper maps and made a life saving discovery.



Fig. 2:- Dr. John Snow's Plan

The concept of Computerized GIS was first introduced in 1967 by Roger Frank Tomlinson (the father of GIS) in Ottawa Canada. 'Canadian Geographical Information System (CGIS)' was the first "Geographical Information System" of the World.

➤ *Geographic Information System in Rural Development*

The Ministry of Rural Development implemented GIS planning for Mahatma Gandhi NREGA Works in the Financial Year 2019-20 for the First time in Punjab. Geographic information contains information about work sites like longitude and latitude. When we marked the Work site on Map it was converted to Geographic Data. Google

Earth Pro Software is used for marking of Work Sites and making KML(Keyhole Markup Language) files. Software provides different attributes (path, polygon, placemark etc.) for marking work sites. It also provides dimensions of assets according to marking.

➤ *GIS Plan of Village Jeeda, District Bathinda*

The GIS plan of Village Jeeda is made according to guidelines of the Ministry. All the Works related to Natural Resources Management (NRM). Following steps are followed for GIS plan:-

1. Firstly we collected/preserved all Work Sites location through WhatsApp Messenger. Boundary of Village is Drawn with the help of Google Maps boundary.
2. The collected locations are marked on Google Earth Pro by Searching location with the help of longitude and latitude information.
3. The irrigation Water Channel to be maintained are marked by path attributes, Community Ponds are marked by Polygon attributes. All attributes given different colours for identification purposes. Short names are given to Work Sites and Full name and Descriptions are filled in the description field. Description contains name of work, village, Cost of Work and Mandays to be generated.
4. After marking all works on Map with the help of Google Earth Pro Software, these are classified into different categories according to Mahatma Gandhi NREGA guidelines.e.g. Irrigation Water Channels are classified as "Micro Irrigation Category" Work, Renovation/Desilting of Community Ponds work is Classified as "Renovation of Traditional Water Bodies" Category etc.

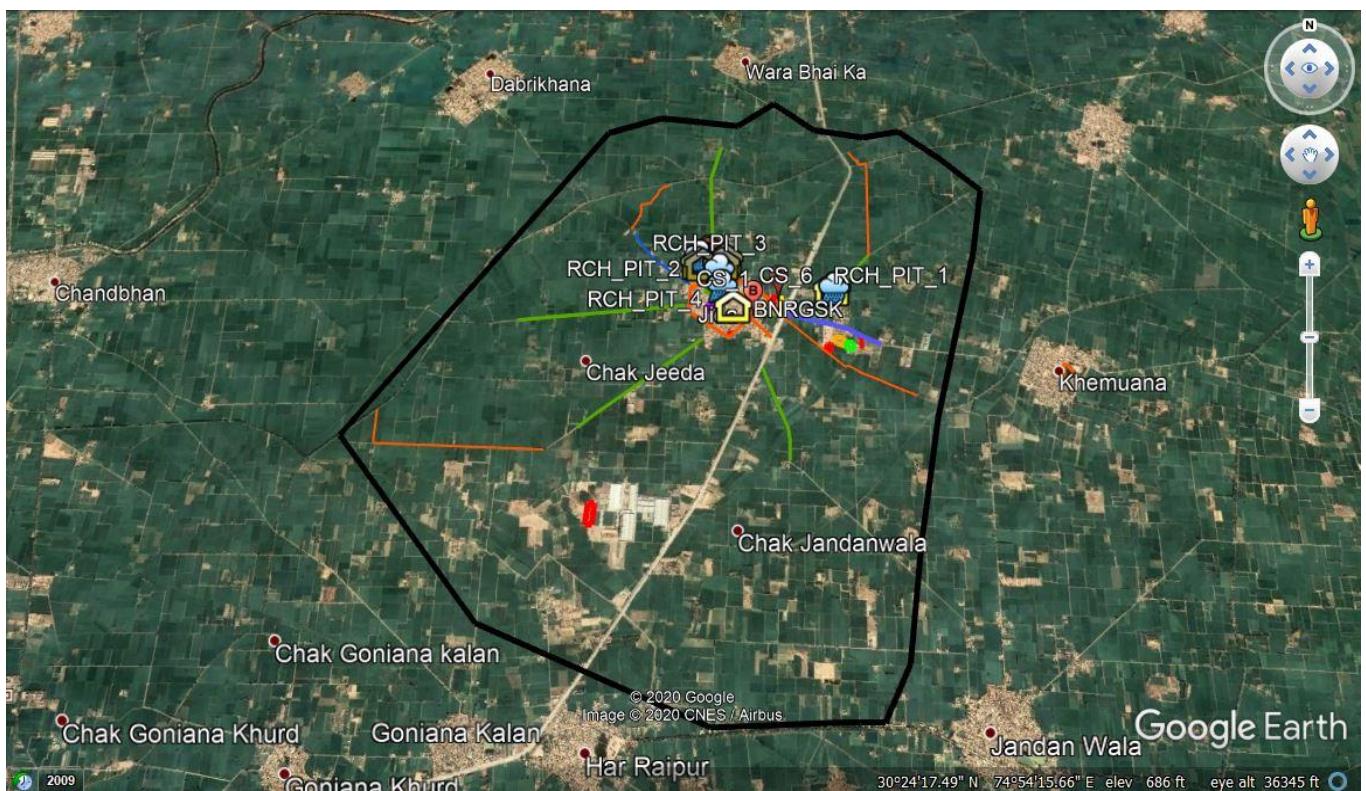


Fig. 3:- GIS plan of Village Jeeda , District Bathinda

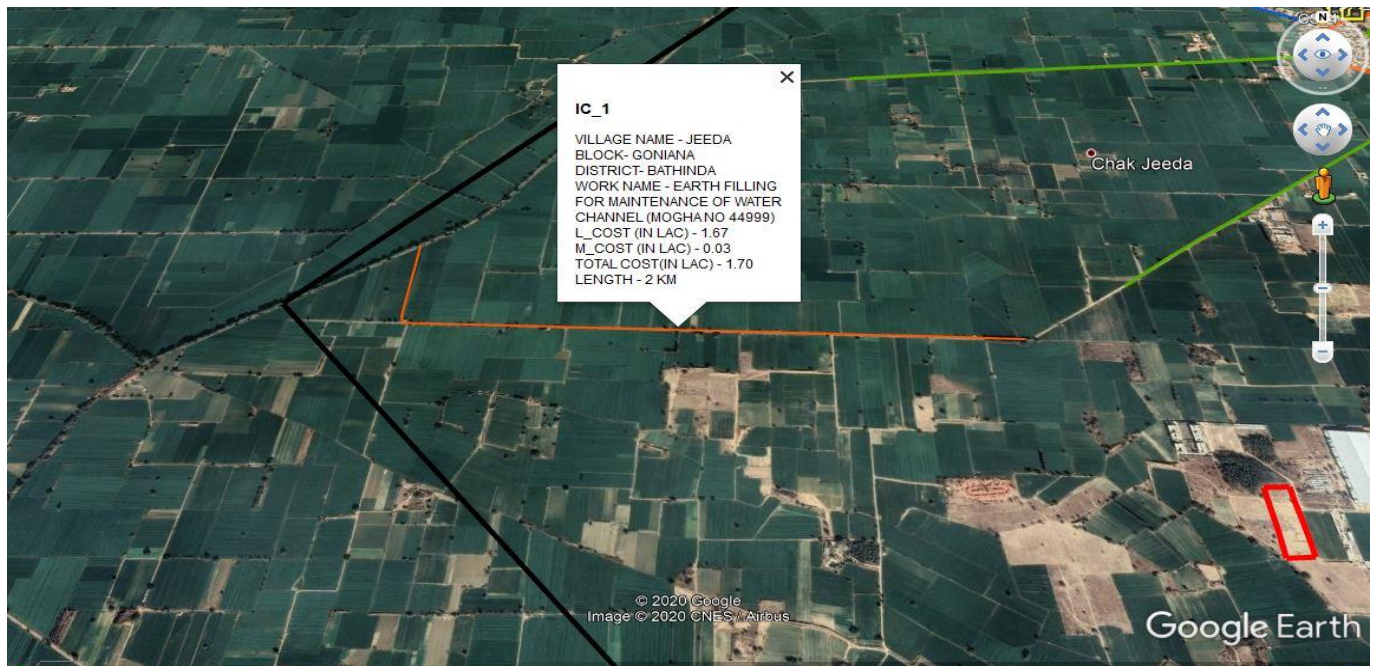


Fig. 4:- Irrigation Water Channel Marked on Google Earth with Description

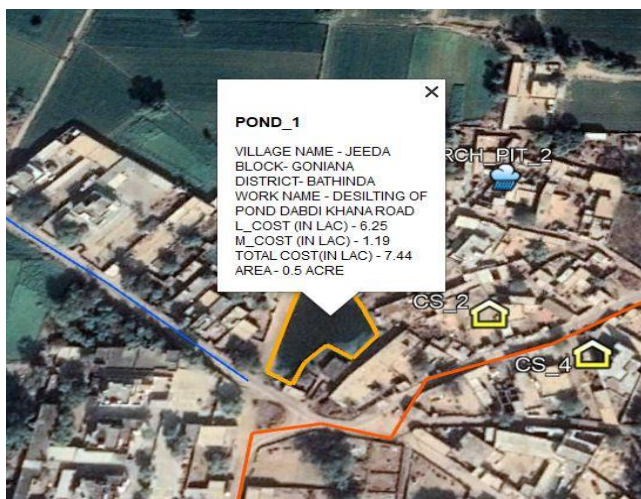


Fig. 5:- Community Pond is marked with description

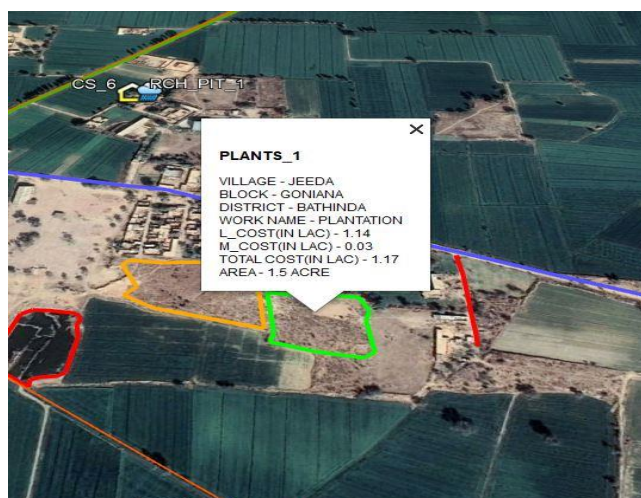


Fig. 6:- Plantation Work Site with description

➤ *Data and Information Management in GIS*

GIS is transforming the way organizations manage their assets, make decisions and communicate. Information is the primary product for GIS planning. An essential goal of an information system is to convert data into information i.e. converting measurements and observations into knowledge which may be used for decision making. Data is input to a process where information is created. An Effective information management will eliminate the need for duplications of records and cross referencing of information.

➤ *GIS For Natural Resources Management*

GIS in natural resource management provides information about land area change between time periods. The land change detected through satellite imagery or aerial photographs. It has a useful application in land change, deforestation assessment, urbanization, habitat fragmentation etc. The information obtained from GIS in natural resource management helps to study the specific area and monitoring can be done in and around the area. It is a way of studying the variations taking place in the landscape.

GIS is a suitable technology for the understanding of natural resource management. It is an effective technique to learn the factors affecting the environment including its result and execution. The geospatial data taken through this GIS meet the sustainable use of natural resources. Thus, GIS in natural resource management guides in managing the resources properly and wisely in the present and future generation. In addition, GIS in natural resource management helps in the management of natural resources effectively and efficiently.

The GIS in Natural resource Management identifies the human impacts on natural resources and support for the utilization of natural resources.

II. CONCLUSION

The Indian government seems to be in the process of making long-term commitments to using GIS for natural resource management. National initiatives are being conceptualised and implemented by different organisations. They involve huge outlays of resources and have the potential to initiate large scale changes in district administration. For these changes to be productive, it is important that these initiatives are carefully planned.

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