Usage of GIS, Gps And Remote Sensing Data to Identify Effective And Optimum Route of Development Projects Like Road, Train and Canal for Better E-Governance Implementation

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ABSTRACT *Land acquisition is the key process for any development projects like road, train and canal route, it required large scale acquisition. Industrial acquisition is the easy process where government can identify the waste land and pass to the industries. While, in case of road, train and canal acquisition may cover agricultural land as well. But, if farmer or owners of land oppose a matter in court it would be unnecessary delay in the project.*
In this research paper we will use Remote Sensing, GIS and GPS data we could have clear idea of boundary of different survey number so that route could be passed near to border areas. Not only that we would also able to identify important potions of farm like electricity connection, water area, green zone, waste land, and so many other parameters which would play key role once we are optimizing the road if route is optimized from farmers aspects farmer would be very happy will easily allow government for acquisition. As farmer will be ultimate beneficiary or road connectivity with his land. And government is able to save the cost of lots of serve cost by spending large scale engineer man power for site survey and if this acquisition gets faster, project would be on time. So, e-Governance projects can be completed within the time and will not impact additional costing of delay which is normally happening with the current projects.

I. INTRODUCTION

Land acquisition is the key process for any development projects like road, train and canal route, it required large scale acquisition[1]. Industrial acquisition is the easy process where government can identify the waste land and pass to the industries. While, in case of road, train and canal acquisition may cover agricultural land as well. But, if farmer or owners of land oppose a matter in court it would be unnecessary delay in the project.

Using Remote Sensing, GIS and GPS data we could have clear idea of boundary of different survey number so that route could be passed near to border areas. Not only that we would also able to identify important potions of farm like electricity connection, water area, green zone, waste land, and so many other parameters which would play key role once we are optimizing the road if route is optimized from farmers aspects farmer would be very happy will easily allow government for acquisition. As farmer will be ultimate beneficiary or road connectivity with his land. And government is able to save the cost of lots of serve cost by spending large scale engineer man power for site survey and if this acquisition gets faster, project would be on time. So, e-Governance projects can be completed within the time and will not impact additional costing of delay which is normally happening with the current projects.

GIS provides a large number and a variety of analytical functions that are capable of replacing manual and traditional methods of route planning. It is a powerful tool to integrate thematic layers in an automated environment to compute possible shortest route with associated costs which eventually can reduce the cost and time of project execution and hence the operating expenses.

Planning for the optimum route requires an extensive evaluation process to identify the best possible path. This path must comply with the requirements of the user in terms of safety and cost. With the fast development of projects like road, train and canal, the need for an optimum route becomes more important as this can reduce a huge operational cost.

GIS is a science and technology which combines different data from various sources for route design processes through spatial analysis. The present study was initiated to demonstrate the use of various data from different sources and geospatial information system (GIS) analysis for developing a path way for developing road, train or pipelines. Road, Trains or canals are the most efficient, cost effective and environment friendly means of transport. Careful and intelligent planning of the road, train or canal route can save on cost, time and other several expenses to ensure longer operational life. Proper planning and management are considered essential means of guiding and accelerating the development.

Field survey is a very important step in the process of land consolidation and rehabilitation. Traditional methods of field survey take much time and effort and it is difficult to locate facilities of projects, to measure area or length and to spot and record problems quickly and accurately. A global positioning system (GPS) based field survey system is introduced. Firstly, the framework of the system is described. Secondly, the key technologies are shown, including data preparation, locating accurately, coordinate transformation, field measuring and field editing. Finally, further applications are discussed. The major result of this study is a GPS based field survey system which will promote the application of GPS personal digital assistant (PDA) technology in the field of land consolidation and rehabilitation, creating an effective method for improving field survey.

II. GIS

- GIS helps the planners in efficient & cost effective decision making based on multiple scenarios available.
- GIS allows integration of all types of data together based on geographical & location components of data.
- GIS is application oriented.
- Frequent revision of digitized GIS data is possible.
- Changes over time can easily & rapidly monitor through GIS.
- GIS technology enables high quality output.
- Spatial patterns & processes can be effectively described & explained by GIS.
- The definition of GIS is not that important but it must encompass Data & concepts concept concerned with spatial distribution (Geographical).

Using GIS we can easily represent the data with real time objects such as roads, land use, etc. Using raster images and

vector we can store data in GIS. There are lots of advantage of GIS like cost saving, better decision making, improved communication, better recordkeeping, managing geographically.
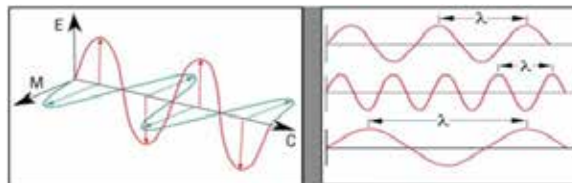
III. GPS and Remote Sensing

The widespread use of computers has led to the development of new technologies, collectively known as geographical information sciences (GISci), for mapping and monitoring features on the surface of the Earth. Foremost for exploration and fieldwork among these technologies are: geographical information systems (GIS), which can take digital datasets and produce maps showing features of interest in matter of seconds; the global positioning system (GPS), which allows positions to be determined to ±10 m anywhere on the Earth's surface; and methods of observing features from a distance, such as photography or infra-red scanning, known as remote sensing. These GISci techniques complement the surveys and sampling that are at the heart of scientific exploration.

GPS is used For connecting & storing points, For collecting & storing routes, a path between two or more points GPS can be programmed to 'beep' when you are within a certain distance of the defined way point. GPS can calculate ground speed as you walk, run, drive or fly.

Using remote sensing we can easily identify the data of earth's surface without contact with it. We can do this by sensing and recording electromagnetic radiation. There are two characteristics of electromagnetic radiation, which are basic to wave theory. One wavelength and another is frequency. The wavelength is the distance between successive wave crests.

IV Conclusion

In this research paper we show that using GIS, GPS and Remote sensing data we can easily find optimum route path for road, train or canal for better e-governance project. GPS tells us "where", whereas GIS tells us "what". Field survey is a very important step in the process of road or train projects. Traditional methods of field survey take much time and effort and it is difficult to locate facilities of projects, to measure area or length and to spot and record problems quickly and accurately. Land acquisition is the key process for any development projects like road, train and canal route, it required large scale acquisition. While, in case of road, train and canal acquisition may cover agricultural land as well. Using GIS, GPS and RS we can find optimum route path for road, train or canal.

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