

**NRDMS BASED DECISION SUPPORT SYSTEM FOR DEVELOPMENTAL PLANNING,
PUDUKKOTTAI DISTRICT, TAMIL NADU, INDIA**

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Abstract

Realising the advanced virtues of GIS technology in planning and development a Decision Support System (DSS) was developed for the drought prone Pudukkottai District. In the said study a hierarchy of GIS data bases were generated on Natural Resources, Physical Resources / facilities in various developmental sectors and Human Resources using ARC/INFO. Further novel Decision Support System was developed using ARCOBJECT. The Decision Support System has advanced credentials in retrieving many type of geospatial information on Natural Resources availability and Conservation, Physical Resources and Human Resources for the whole District, Taluk wise, Block wise, Panchayat village wise, Watershed wise and Feature wise. This is expected to be a very advanced tool for the planners and decision makers.

1.0 INTRODUCTION

The Satellite based Remote Sensing has provided a lot of virtues in mapping the various terrestrial features and natural resources of the Planet Earth. Hence, the scientists and the technocrats of different fields such as Geologists, Hydrologists, Agriculture scientists, Foresters, Oceanographers, etc. have started using this technology widely for their respective resources survey and to create management strategies owing to its synoptivity, multispectral nature and repetivity. Where as, the recently borne GIS/Geospatial technology has proved its advanced credentials not only in preparing various thematic maps but also in storing, manipulating and modeling huge amount of geospatial data. Hence, now not only the scientists and the technocrats from all over the world, but also the personnel indifferent tiers of administrative hierarchy have started employing this tool for quickly accessing the geospatial data on natural resources, including environment & natural disaster scenario, physical resources / facilities and human resources too in raw mode as well as various derivative modes for planning and decision making.

Hence, obviously a need has come to convert these geospatial information into a decision support system, so that the planners and decision makers can spontaneously use these information and take instantaneous decisions. So, by duly realizing the potentials of GIS, a study was under taken in rural locked Pudukkottai district located in the South eastern tip of India (Fig.1). For the said district, various types of geospatial data bases were generated on different themes related to the above three resources and also different user needed end geospatial models were also developed. The entire hierarchy of GIS data bases were converted in to a Decision Support System.

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2.0 METHODOLOGY

The methodology involves,

- The preparation of various maps on basic natural resources related themes using remote sensing / collateral data, field survey etc. and creation of GIS data bases in ARC/INFO environment
- The collection of Panchayat Village wise information on Physical resources/facilities and creation of GIS data bases
- Finally, the customization of all the spatial and non spatial data easy retrieval using ARCOjects and creation of decision support system to facilitate the planners, administrators and technocrats etc.

3.0 GIS DATA BASES AND BASIC THEMES

GIS data bases were generated in ARC/INFO environment on certain basic natural resources related themes which are numbering over 30 are as follows:

- District map with Taluk Boundary
- District map with Block Boundary
- District map with Village Panchayat Boundary
- Geology map
- Structural Trendline & Fold Style
- Geomorphology
- Land use / Land Cover, etc.

The geomorphology map is shown as an example in Figure.2.

4.0 GIS DATA BASES ON NATURAL RESOURCES

GIS manipulation of different basic natural resources related thematic maps were carried out and GIS data bases were created a

- ❖ Mineral Resources
- ❖ Surface water resources and
- ❖ Ground water resources

As far as the natural resources conservation was concerned, greater emphasis was given to water conservation and soil conservation. The GIS out put showing the sites suitable for the construction of check dams is given as sample here (Figure.3).

5.0 GIS DATA BASES ON PHYSICAL RESOURCES

The panchayat village wise data were collected on various physical resources on different sector viz

- Education sector
- Health sector
- Drinking water
- Irrigation sector
- Transport sector
- Communication Sector
- Electricity sector
- Veterinary sector
- Public facilities
- Revenue / Land sector and
- Agriculture sector,

GIS data bases were created for different variables belonging to the above eleven sector accordingly.

6.0 GIS DATA BASES ON HUMAN RESOURCES

The panchayat village wise data collected on various human resources, especially are

- Employment Sector and
- Demography.

These data were entered in computer and linked with panchayat village map for spatial display.

7.0 DECISION SUPPORT SYSTEM (DSS)

The query based Decision Support System (DSS), in ARCOjects environment was developed finally and the same was named as Query Based Information retrieval System (QUBIS).

This QUBIS has got the following modules / credentials:

- General Display
- Display of Thematic maps
- Display of maps on Natural Resources
- Display of maps on Water Conservation
- Display of maps on Soil Conservation
- Spatial Display of Physical resources
- Data Updation
- Clear screen
- Exit and
- Reference

By clicking the '*General Display*' option in main menu, one can get a pull down menu with the following options:

- ➔ Base map
- ➔ District map with Taluk boundary
- ➔ District map with Block boundary
- ➔ District map with Village Panchayat boundary
- ➔ District map with Watershed boundary
- ➔ Satellite image of Pudukkottai district

On the same, any map can be viewed or got printed.

Similarly, if one clicks into the '*Thematic Maps*' option in main menu, the following pull down menu will appear displaying the options like

- Entire area
- Taluk wise
- Block wise
- Village Panchayat wise
- Mini Watershed wise
- Feature wise

Suppose, if one clicks the '*Entire Area*' option, a window will open with the text box listing all the 30 thematic maps. Any thematic map for any one of the Taluks or blocks or mini watersheds or Panchayat villages can be displayed by selecting and clicking the desired options.

Similarly, all Natural Resource maps, Soil Conservation maps, Water Conservation maps can also be retrieved by selecting the relevant menu on the screen. The required thematic map for the Entire area, Taluk wise, Block wise, Village Panchayat wise, Mini watershed wise and Feature wise can also be retrieved by clicking the respective options.

For example, If one wants to see a specific feature, say "*on Water Conservation*", he can click the water conservation main menu, then the desired feature, say "*Check Dams*" it will display all the check dams of the district. For example the check dams so displayed are shown in Figure 4.

In the same way, if one wants to see any thematic maps for a particular panchayat village the same can also be displayed by clicking the village wise option in the pull down menu and then by selecting the required thematic map and the village for display. The geomorphology map so retrieved for Kallampatti village is shown as an example in Figure 5.

Similarly, the Decision Support System (DSS), was also developed for 11 sectors in physical resources and two sectors in human resources.

Thus, enormous amount of options were provided in the Decision Support System to retrieve any type of information and to handle the maps such as wrapping of various maps over any thematic map, listing of numerical data for the entire area or for a particular feature, measuring the distance between two points, zooming up, zooming down, panning, getting full extent of the displayed map, refreshing the screen, graphical selection, etc.

8.0 CONCLUSION

This Decision Support System is expected to be a boon for the planners and administrators for quick decision making.

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