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GramyaVikas: A distributed collaboration model for rural development planning

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ABSTRACT

In the context of rural India, planning is mainly prescriptive (through mandated schemes) and top–down (by extension community from the line departments). Realizing the above mode of planning and the increasing demand for Geographical-Information & Communication Technology (Geo-ICT) applications in the rural systems in India, a prototype distributed collaboration tool, called *GramyaVikas* (rural development), has been developed to assist the rural extension community in their own decision-making processes in a more interactive, integrated and coordinated manner. *GramyaVikas*, evolved out of the needs assessment of the user community, is a secure and cost-effective system developed for defined users with *open source* (a) content management system and (b) Geographical Information Systems. This web-based tool will help the users to share and retrieve data/information; communicate for taking mutual decisions; make useful queries on spatial and nonspatial database to identify candidate villages/entities; and generate various views or scenarios for different rural development schemes. Presently, this Geo-ICT tool is being developed in an Intranet environment. The resulting system is intended to assist the remote users in analyzing rural-informatics for rural development planning decisions online, with customized GIS tools to suit the requirements of a few line departments for decision-making.

1. Background

The national planning process of India has undergone many changes since its initiation in 1951. Decentralized planning is currently accepted as the national planning strategy. Toward this end, the Constitution has been amended (73rd Amendment Act, 1992) to empower the State Governments to form Institutions of Local self-Governance (ILGs) (like *Panchayats*, a local-level governing body with a nearby group of villages) and to take into consideration the local needs and conditions for decision-making. The mandate of such local level bodies is to plan and implement integrated development schemes. Such planning, based on equity and popular participation by the planners and professional staff of line ministries, is expected to result in an overall improvement in the quality of rural life, conservation of resources and reduction in disparities. However, this task is made more difficult by the strict sectoral structure of government activity and formal information about natural resources, socio-economic conditions and infrastructure facilities in the districts. Implementation of this type of local level planning requires a detailed knowledge of the relationships and dependencies between various sectors to resolve the often conflicting demands. Although there has been data and information dependency for taking decisions on mutual schemes, there is, in general, no coordination and interconnectivity among the line departments (government agencies at district and sub-district levels, represented by various ministries). In this context, Geographical-Information

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& Communication Technology (Geo-ICT) has demonstrated its effectiveness as a tool for information gathering and dissemination in many decision-making processes for rural development, almost in a real time mode.

Geo-ICT is an enabling technology that is stemmed from the integration of geospatial information and imaging technology with ICT. It is considered as a core technology in the 21st century for spatial decision-making, geo-computation and location-based services (LBS) (GeoICT Lab, 2007). Geo-ICT encompasses synergy and convergence of various modern technologies dealing with the diverse aspects of spatial and nonspatial and data management including: data acquisition, data assimilation, data analysis, information generation/dissemination and decision support. As such, Geo-ICT is generally considered a valuable tool for effective and good governance at state, private or civil society (Beerens, 2006). Some of the major initiatives of the Government of India in this regard are National (Natural) Resources Information System (NRIS) of the Department of Space (NRIS, www document), GISNIC/DISNIC (Geographical/District Information System) of the National Informatics Centre (NIC, 2005) and the Natural Resources Data Management System (NRDMS) of the Department of Science & Technology (NRDMS, www document). These are primarily meant for setting up district level databases to facilitate the use of Geo-ICT in local level planning and governance.

Examples showcasing the open source GIS solutions for Internet-based applications are as follows: (1) representing the animal population census and large volumes of livestock disease data as dynamic thematic maps (TNV&ASU, www document) and (2) map browsing, querying and drawing thematic maps dynamically for rural decision-making (NIC, www document). Vision 2020 conceived by the Indian Planning Commission has emphasized upon India evolving into an information society and knowledge economy built on the edifice of ICT, and shifting the determinants of development from manufacturing to services and capital resources to knowledge resources (Science and Technology Policy, 2003). Concerned authorities are also taking initiatives towards cyber extensions in India. District level Web Sites are being hosted, Information Kiosks are being established at Block or Mandal (cluster of villages) and village levels; and technical and other need-based information are being collected, digitized and hosted on the Internet (Sharma, 2006). The Extension Reforms Scheme is a centrally sponsored scheme approved by the Government of India – "Support to State Extension Programs for Extension Reforms" – prepared during the Tenth Plan period (2002–2007). This scheme is a major initiative towards revitalizing agricultural extension services in the states to make the extension system decentralized and demand-driven (MANAGE, www document). The Indian Council of Agricultural Research (ICAR) has a big plan through its "National Agricultural Innovation Project (NAIP)" sponsored by the World Bank to strengthen the information, communication and dissemination systems (ICDS) for a wider dialog and interaction within the system and among the stakeholders (ICAR, 2006).

Miller et al. (2003) has demonstrated the Geo-ICT application for rangeland watershed management. They have developed an Internet-based Spatial Decision Support System (SDSS) for the rangeland managers to select the type and location of best management practices. Office of the Arid Land Research (OALS) at the University of Arizona provides web resources for rangeland natural resource managers and decision makers; including interactive tools that illustrate and map vegetation dynamics across large areas over time. These tools incorporate satellite imagery and digital maps in ways that complement traditional rangeland management tools, such as, field-based inventory and monitoring techniques (University of Arizona, 2004).

Krishna Reddy and Ramaraju (2006), developed Information Technology based on a personalized agricultural extension system, called E-Sagu, to improve farm productivity by delivering high quality personalized farm-specific agro-expert advice in a timely manner to each farm, at the farmers' doorsteps, without the farmers asking a question. A multilingual online question and answer forum, called "Almost All Questions Answered" (aAQUA), provides online answers to questions asked by farmers and agriculture professionals over the Internet (aAQUA, 2002).

Considering the current rural development planning by the rural extension community in Indian districts, and the increasing demand for Geo-ICT applications in the rural systems in India, an R&D project titled "GIS based Rural Development planning at District/Sub-district level" was taken up under the auspices of the Ministry of Rural Development, Government of India. One of the objectives of the project was to develop an online tool to assist the rural extension community in Indian districts in their decisions for rural development planning.

1.1. *Needs assessment*

To test and validate the concepts of Geo-ICT for rural development planning in Indian districts, a drought-prone district, called Mahabubnagar, representing a semi-tropical region in the southern part of India was selected. After establishing working relationships with the rural extension community and the district administration, a needs assessment exercise was carried out in the form of discussions (with the decision makers in groups and individually with each line department), by formulating questionnaires (Table 1) and workshops. This exercise was to grasp the requirements of the district planners or functionaries in terms of the type and nature of databases, so that a suitable GIS or Web system could be developed for use in their day-to-day decision-making on planning, implementing and monitoring of rural development programs in their jurisdiction. As a part of this exercise, in collaboration with the District Administration of Mahabubnagar District, a User Interaction Workshop, titled "Needs Assessment for the Development of Rural-Informatics in Decision-making at District/Sub-district Level", was organized at the district headquarters (http://www.csre.iitb.ac.in/adi/projects/adi-workshop.htm). One of the important observations and common requirements of the district planners was to have an online system to carry out mutual schemes in a collaborative way (distributed collaboration) as many of these mandated schemes are inter-dependent and inter-departmental. *GramyaVikas* is an attempt towards achieving this objective. As this model is attached to the rural extension community for taking decisions on rural development aspects, the model