ABSTRACT

An attempt has been made in the present study to integrate remote sensing and GIS techniques to identify and quantify the wastelands, to evaluate the land quality and water resources for assessing the resources potential in Nagalar sub-watershed. To suggest the site-specific wasteland reclamations, firstly one Mini-watershed (Pulimankombai) within the sub-watershed and secondly two micro-watersheds with in the mini-watershed had been analyzed.

At regional level on 1:50,000 scale, land and water resources are assessed individually integrating information derived from remote sensing satellite data duly field-checked and relevant collateral data. By combining both land resources with water resources using GIS techniques, a composite map on the Resources Potential Zones (RPZ) is derived and correlated with the existing land use classes (LUC) to bring out another map showing resources potential utilization zones (RPUZ), which gives information on the extent of current land-utilization levels. Moderate, under and least utilized zones are regrouped to show Potential zones Available for Wasteland Development (PAWD). Satellite data – derived wasteland categories are integrated with PAWD using GIS techniques to delineate Priority Zones for Wastelands Development (PZWD), which ranges from PZWD-1 to PZWD-5. These zones indicate the levels of effort required for converting wastelands into productive lands. For example, permanent fallow in PAWD-1 could be easily reclaimed to agricultural land use with minimum or no conservation measures on a regional scale. However, planning at grass root level necessitates cadastral level GIS analysis. Two sites are selected so as to represent agricultural predominant and forest predominant micro-watersheds.
Wasteland categories extracted from the high-resolution satellite data are combined with existing revenue records on 1:12,500 scale by transferring the data to each plot and the final map thus derived shows field sub-divisions and types of wasteland. A Detailed Soil Survey has also been conducted to assess the land capability, land irrigability and crop suitability. Landuse classes are superimposed on this map to obtain the level of current utilization.

Suggestions for wasteland development have been arrived at based on the suitability determined by the physical and socio-economic factors. Two options are given for reclamation of each land parcel based on the physical and economic constraints and grouped under minimal and maximum efforts. Field verifications were carried out to assess the suitability of the measures suggested and also interaction sessions were held with local farmers to ascertain their level of acceptability for the suggestions.

The acceptability of farmers for reclamation processes based on their land holding size shows that all large farmers readily accepted the first option and for the second option, which involves maximum effort only 50% of them expressed willingness. In the case of medium farmers the acceptability for the first option is estimated to be 50% and 33% for the second option. Small farmers showed a high percentage of acceptances (83%) for the first option and 17% for the second option, whereas the acceptability by marginal farmers showed 80% and 8% for the first and second options respectively. The level of acceptability can be correlated with lack of fund, inability to cope with the modern techniques and societal framework.

The study proves that by adopting integrated resources analysis through Remote Sensing and GIS techniques, it is possible to assess the suitability of the land parcels for a particular land use and to advise the individual farmer on the course of action to be taken. The methodology is simple and can be adopted in any area.