

Online GIS Monitoring System for Sericulture Development in Manipur

The online GIS monitoring system for sericulture development in Manipur is a solution for monitoring the progress of sericulture plantation using GIS, Satellite Imageries, Geo-tagged photographs and Vegetation Data. The implementation of the system in the State has helped the Sericulture Department to monitor the farms/units spread across the State, which includes production in the far-flung areas even without physical visit to the sites.



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Geographical Information Systems (GIS) are designed to capture, store, structure, analyse, manage and present all types of spatial or geographical data. Such systems have advanced immensely over the recent years and have become integral to various ICT-based solutions for development activities.

GIS has evolved as an essential system to simplify the various intricate activities of Sericulture. Manipur's Sericulture is one such complex area for which the potential of GIS was identified for application. Considering various parameters of the scheme, NIC took up the task of developing a GIS-based Interactive Application for monitoring the progress of host plants, cocoon production, fund flow, beneficiary management, etc.

The GIS based Interactive Application developed by NIC is a solution for monitoring the progress of sericulture plantation by using GIS, Satellite

Imagery, Geo-tagged Photographs and Vegetation Data. With the implementation of this system, the Sericulture Department of the State is now able to easily monitor the farms/units scattered all over the State, including production in far flung areas without physical visit to the sites. The Department of Sericulture of Manipur aims to increase sericulture production with the use of ICT-based solutions by implementing various projects and schemes funded by the Central Government and the State of Manipur.

DEVELOPMENT OF THE SOFTWARE

Developed with Open source technologies and standards using PHP 5.4, the online application has a back end database PostgreSQL 9.1 with PostGIS ERDAS Apollo Server as map server. Open layer and Google earth API libraries are used for rendering the satellite images by web browsers. For uploading geo-tagged photographs, Android-based Smartphones having GPS and GLONASS positioning systems are used. Boundary coor-



Hon'ble Chief Minister, Shri Okram Ibobi Singh inaugurating the online GIS monitoring system



Screenshot of GIS based Interactive application



Network of Online GIS monitoring System

ordinates of Units/farms are collected with GPS devices. The application (<http://msmonitoring.nic.in>) is hosted at the NIC Manipur Mini Data Centre, Imphal.

FEATURES OF THE SYSTEM

Satellite Data for Progress Monitoring of Plantation

GIS, GPS, Smartphones and Remote Sensing technologies are used for monitoring the progress of mulberry/host tree plantation. The plantation-monitoring module uses geo-tagged photographs and data collected from free or paid satellite sensors and images. Vegetation data from the satellite sensors are processed and uploaded to the GIS Server installed at NIC Manipur Data Centre. The system shows the plantation progress for a given timeline and enables the department to take appropriate corrective measures without visiting the actual site.

Geo-Tagged Photo

A smart phone application has been developed for geo-tagging and time stamping each photograph. Smart phones are checked to identify whether it is inside the boundary or not. Once it is confirmed, photograph can be taken and uploaded to the portal. All these activities are handled by using an android-based App called 'Ser-iManipur'.

Co-Ordinates of Farm Area

The system has been designed using the co-ordinates of the plot for verifying it through satellite image. The farm/unit profile along with boundary co-ordinates of at least four points is captured in the system using hand-held GPS devices to earmark the farm area. Beneficiary farmer profiles of each farm/unit are also entered in the system. Boundary co-ordinates are used for taking Geo-tagged photo, plantation monitoring, etc.

Fund Flow Management

The system is also designed for scheme-wise capturing of funds flow. Receipts and payments of money are also monitored using the system.

Production Management

The system has provisions to upload quarterly Production Data of each farm, which are captured to monitor progress of individual rearing farms.

MANAGEMENT INFORMATION SYSTEM

Satellite Image

The system generates reports with satellite images for a particular plot, providing a fair idea of whether the plantation is on-going or not. Such reports are extremely useful for the plots, which are difficult to visit.

Historical Time Slider

System generates Historical Time Slider Reports showing different stages of plantation growth. It can show 5-10 slides per report. Number of slides can be reduced or increased depending upon the need of the user department.

PRODUCTION REPORT

The system allows farmers/District Data Managers to upload data of Cocoon production periodically which enables recurrent generation of production reports.

CONCLUSION

The MIS is developed using Google Map data. Further, it is proposed to utilize data from NRSC, Digital Globe, Bhuvan, Vito, etc. It is also planned to utilize Vegetation Data for marking the distinction between host plant and other unwanted plants. The same software can further be explored for monitoring other schemes such as construction of roads and schools especially of India's North-East region.

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