

AWARDS SCHEME FOR EXEMPLARY IMPLEMENTATION OF e-GOVERNANCE INITIATIVES

NAME OF CATEGORY- 'INNOVATIVE USE OF GIS TECHNOLOGY IN e- GOVERNANCE'

1. Coverage – Geographical and Demographic :-

(i) Comprehensiveness of reach of delivery centres.

SILKS web-portal covers 41 sericulture districts in eight North Eastern States viz. 9 in Assam, 7 in Arunachal Pradesh, 2 in Meghalaya, 9 in Manipur, 6 in Mizoram, 2 in Tripura, 5 in Nagaland and one in Sikkim. (Map attached)

(ii) Number of delivery centers

SILKS as web portal is on public domain and accessible to one and all -deliverables as query based printouts of potential area at internet outlets. Eight NE state sericulture department headquarters, 41 district sericulture Offices, 36 CSB's units i.e Regional Office and R& D field unit deliver the required outputs. Weather advisory dissemination from 9 IMD-Agri Met Field Units-linked dissemination mode covering wide aura of communication. There are over 125 stand alone packs (3-5 for each of 41 Districts) for demonstration cum service points to remote locations, 200 CDs with extension staff displaying the potential area information and 1900 number of registered mobile users receiving advisory through SMSs.

(iii) Geographical

(a) National level – Number of States covered

8

(b) State/UT level- Number of Districts covered

41

(c) District level- Number of Blocks covered

251

Please give specific details:-

ICT based sericulture technology packages, backward-forward linkages, information on timely weather and expert advisory & SMSs

(iv) Demographic spread (percentage of population covered)

Around 65% of rural population of 41 districts of North-eastern State who are dependent on agriculture for livelihood.

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2. **Situation Before the Initiative:- (Bottlenecks, Challenges, constraints etc with specific details as to what triggered the Organization to conceptualize this project):**

North Eastern states have the inherent problem of difficult terrain, sparse population, and limited communication and infrastructure facilities. But the region has vast tracts of cultivable wastelands which can be brought under Sericulture activities. Traditional methods to identify additional areas suitable for expansion of sericulture activities require laborious physical surveys, intensive field verification, complex soil analysis, assessment of ground water potential, analysis of large volume of weather data etc., where time and cost become the limiting factors. Reliable data on potential areas for sericulture development was not available and delineation of potential areas was a challenging task with severe constraints e.g. limited manpower and machinery to cover large inaccessible areas in the selected districts in NER. Dissemination of information on recent technologies to the planners, administrators, sericulturists is also a challenge in the region due to lower levels of awareness and skills on potential use of IT tools for sericulture planning and development.

3. **Scope of Services** (Relevance of application for e-governance, extent to which service is delivered through GIS)

The geoportal on Sericulture Information Linkages and Knowledge System (SILKS) is a highly relevant, up-to-date, single window access system with R&D findings in the form of technology packages, which have effectively brought in local languages comprehensible to farmers. Suitability maps of locations based on Remote Sensing and GIS applications facilitate effective implementation of development plans. Resource optimization based on natural resources, details of potential areas for sericulture, climatic conditions help in concentrating on selected pockets and meaningful monitoring. Weather forecasts and advisories through media and SMSs minimize crop losses. Packages of best practices for sericulture activities and disease forewarnings facilitate effective preventive measures and timely intervention.

4. **Strategy Adopted**

(i) The details of base line study done,

Satellite remote sensing was used to prepare base line information on present land use, soil types, climate and terrain conditions. In addition, access to information on suitability of areas for sericulture, soil conditions, knowledge of farmers on technologies and resources were taken up under various surveys to

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assess the knowledge gaps in sericulture .

(ii) Problems identified:

Non-availability of information on suitable areas for expansion of sericulture and lack of effective mechanism to reach technology packages in local languages to farmers were severe constraints. There was also lack of ready made information on diseases and their prevention, care for food plants and silkworms, soil health conditions and day to day needs for sericulture in a package form. Non availability of weather forecasts and disease forewarnings posed serious challenges.

(iii) Roll out/implementation model:

SILKS portal has been developed using Open Source GIS tools with the integration of data on various aspects of sericulture development. RDBMS was used for database management. GIS techniques have been used to conduct spatial and geostatistical analysis while preparing potential area maps.

(iv) Communication and dissemination strategy and approach used:

Multi access mode: Internet open access—through web portal, Stand alone PC pack, KIOSKs, VKCs and VRCs-weather advisory in English and Regional Languages through periodic bulletins from Agromet-Field Units, Radio, local media News Papers, Internet Points, Transfer of Technology and Interaction Programmes with farmers via live demonstrations, SMS service. Technology and farmer useful information dissemination in six local languages of North Eastern States viz. Assamese, Mizo, Manipuri, Nagamese, Khasi and Garo and Bengali

5. Technology Platform used-

(i) Description,

Server : Windows Server 2008, Webserver : XAMPP,

Database: PostgreSQL/PostGIS.

Geographical data services via internet require proper management of spatial and non-spatial data. Geographic Information System helps in effective analysis and management of spatial data. Spatial data attributes have been efficiently managed using open source based Object Oriented Relational Database Management System (ORDBMS). Developed with Web-based system by integrating GIS and ORDBMS allowing the user to operate the

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system without having to understand with the underlying intricacies of GIS and ORDBMS technologies and also sharing of spatial information and technical expertise among varied users. SILKS is developed by integrating the Minnesota Mapserver (UMN), PHP, Apache Web Server, Chameleon, PostGIS and PostgreSQL Object-Relational data-base by adopting a Web based client/server environment. The system is a web-based platform for collaboration and data sharing between specialists, planning agencies, citizens, and private entities. Web browser & Inter-net is only required for the spatial data-base access .

(ii) Interoperability :

The application has been developed within the scope of interoperability standards (OGC). The SILKS portal being browser based, works in all Operating Systems.

(iii) Security concerns:

All the data of SILKS resides in RDBMS called PostgreSQL / PostGIS --the best Open Source Database management system at present and as such provides the required database security, management and regular backup of the data in case of system breakdown.

(iv) Any issue with the technology used:

The PostgreSQL / PostGIS database offers optimum service requirement for map accessibility but with medium band width.

(v) Service level Agreements(SLAs) (Give details about presence of SLA, whether documented, whether referred etc. #)

As there is no issue of publishing data from the product, the execution of SLAs does not arise. The specific SLAs shall be prepared when we choose to publish the data as per needs.

6. Demonstrate Innovation in use of GIS Technology for e-Gov (Give details of technology used - Architecture, Platform, Open Source tools, Front-end development, Remote Sensing & Mobile Technology integration, SMS & email)

Unique feature of the SILKS project is identification and mapping of potential area and development of SILKS web portal as a single window ICT tool for planning, implementation and development of sericulture activities using RS & GIS tools. It is a simple web-enabled Client Server system, working in MS

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Windows operating system. Modern tools like SRS, Geographical Information System (GIS) and Management Information System (MIS) are being used in this project. The non-spatial modules were created using Web Tools such as HTML, CSS, Java Scripts etc. Satellite remote sensing was used to assess the availability of crop lands suitable for sericulture development. Thematic information generated from satellite imagery and other ancillary information are integrated under GIS domain to generate location specific information on areas suitable for sericulture in the North Eastern Region.

The Sericulture Information Linkages and Knowledge System (SILKS), one of the major components of the project would provide expert advice on crop selection, farm practices, silkworm rearing, post-cocoon value addition, price trends etc. The SILKS spatial modules have inbuilt webGIS tools for displaying and querying of spatial data. It is developed using open source software packages. The UMN Map server is used as a GIS engine, PostgreSQL/PostGIS is used as an object oriented relational database management system (RDBMS) and GeoServer for creating OGC (Open Geospatial Consortium) web services. An open source web application tool built on top of MapScript using the PHP programming language has been used for development of Interactive User Interface. The non-spatial modules were created using Web Tools such as HTML, CSS, Java Scripts etc. Satellite remote sensing was used to assess the availability of crop lands suitable for sericulture development. (Detailed note appended as 6DI_GIS.Pdf)

7. **Interoperability & security** (Give details about ability to leverage sharing amongst stakeholders in accordance with map policy, Token services, SSL)

Browser based SILKS works on all Operating Systems. Interoperability of data sharing with other users is not provided in the architecture at present , however the data-can be provided if need arises. SSL/Transport Layer Security (TLS) have been used on the web application for securing the data transmission. The web application resides on a server in Demilitarized Zone (DMZ).

8. **Scalability** (Give details with respect to technology (Platform, Hardware & software) & data (high and low Geographical and Demographic scale)

The methodology applied in development of SILKS is up scalable to other areas of where sericulture is planned for expansion with suitable modification being local parameters. The technology of RS and GIS is highly adaptable to plan the project. Need based application of satellite technology (Resource mapping, parcel mapping, land resource inventory etc, and development plan

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based on these inputs) is possible as per the project requirement.

Hardware is accommodative of additional expansion of load and software being developed with open end sources, Can be best used to upscale as per needs. The SILKS can be enhanced or upgraded to facilitate various user modes such as SILKS on mobile, crowd sourcing of sericulture related information from SILKS users through SMSs and updating the portal. Integration of remote sensing imageries for better correlation of spatial maps with the real ground imagery and for overall comparative information analysis can also be extended to SILKS in future.

9. **Sustainability & adaptability** (Give details w.r.t architecture/ technology, updation of spatial data, training, human resource, research, local language)

- Human resource has been developed through one national seminar, 4 regional workshops cum hands-on-trainings covering 20 district officers of three States and 24 awareness campaigns to State sericulture Planners guided by State Remote Sensing agencies. Appraisal meetings have been held for enriching human resources on usage.
- Exposure to 245 farmers on SILKS features through demonstration of SILKS in district sericulture offices using stand alone packs
- SILKS has all features in English, Non spatial contents in Hindi are also made available. Farmer useful information dissemination has been done through selected modules in six local languages Assamese, Nagamese Mizo, Manipuri, Khasi & Garo and Bengali. Weather advisory is in English. However, Hindi/local language from Indian Meteorological Department(IMD)-AgroMet Field Units(AMFU) is interlinked into the website. Sericulture advisory has been disseminated on pilot basis through SMSs in two districts of Assam i.e. Lakhimpur and Golaghat.
- The updating of the spatial data can always be done wherever new data sets are available for replacing the old data.

10. **Adaptability Analysis**

(i) Measures to ensure adaptability and scalability:

Flexible programming has been done to add locally needed information through farmers service modules, Open web space for add-on features and single service maintainer for upgrading on regular basis. The SILKS software uses the robust open source packages and stable architecture for data

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dissemination. The packages can be upgraded to the versions latest without affecting the frame work. Already the project has been taken to other areas in 18 states for 67 districts outside North- eastern states. Plans are afoot to replicate the development of SILKS in other non-covered districts of all other states in phased manner.

(ii) Measures to ensure replicability:

The application has the mechanism to replicate in other locations within the States and uncovered districts. The entire SILKS map domain can be further framed to fit these new technologies for better viewing and analysis purposes by the users. The conversions of SILKS textual contents into various local languages can also be done to make SILKS usable to various cross-languages users.

(iii) Restrictions, if any, in replication and or scalability

There are no restriction for replicating the methodologies and the project can be extended to whole of India; as permitted by the Map Policy & RS Data Policy of India.

(iv) Risk Analysis

There is no risk in bringing more area under green cover and reclamation of wastelands.

11. Accountability (Give details in regard to roles, responsibility, facility for audit trails)

CSB headquarters has overall responsibility to maintain and operate periodic quality check of contents and utility of SILKS. R& D units- update transfer of technology and advisories. North Eastern Space Applications Centre[**NESAC**] takes the responsibility of Spatial data updating, technical operation and trouble shooting, **State governments** for periodic updating information & dissemination to farmers and planners. Indian Meteorological Department [**IMD**] for DAAS will help in Sericulture advisory dissemination.

12. New Models of service delivery (Give details about Public/ private/ NGO/ academic linkages/ citizens)

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SMS Services: Advisory dissemination has begun through Mobile operators on SMS value added advisory on sericulture in local language. Indian Meteorological Department(IMD) disseminates sericulture advisory to 1685 farmers covering Lakhimpur, Golaghat, and Dhemaji districts of Assam. IMD linked District Agro Met Advisory Service dissemination through AMFUs is also reaching targeted sericulture farmers.

13. Citizen Centricity (Give specific details on the following#)

(i) Impact on effort, time and cost incurred by user,

Multi mode access points ensure easy access with very little time, cost and effort for required information. Services in the portal are free in nature. SMS service is also free of cost.

(ii) Feedback/grievance redressal mechanism,

Feed back and complaints and contact facility has been incorporated in the main feature of SILK web portal.

(iii) Audit Trails,

Protocols on mandatory audit of public domain services conducted by identified outsource service providers has been assigned with maintenance of portal

(iv) Interactive platform for service delivery,

The geoportal-SILKS is a open source software based and hence service delivery is not a problem.

(v) Stakeholder consultation,

Consultations on regular basis on quality of service and suggestions done with State sericulture departments on finding out the potentiality, for improvement from State, District and farmer interactions while conducting demonstrations. Improvements made over and incorporated. [Feed backs from States]

14. Efficiency Enhancement (Give specific details about the following #)

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- (i) Volume of transactions processed,

Periodic weather forecast and agro met advisory bulletins, 156 district level sector-wise (Mulberry, Muga, Eri and Oak tasar) potential area maps generated. 156 potential block wise village data has been generated.

- (ii) Coping with transaction volume growth

Over the last 10 months of keeping the portal open to public on the Internet, CSB had no problems in coping up with the volume.

- (iii) Time taken to process transactions,

No delays

- (iv) Accuracy of output,

Potential area data verified by ground truth on actual survey, Inputs from only authorized (Department of Sericulture of the States) have been incorporated. It is found the spatial information gives an accuracy of 85-90 % in terms of area.

- (v) Number of delays in service delivery

Since the portal is on the Internet at Url: <http://silks.csb.gov.in>, the users had no delays in receiving the services from the portal.

15. User convenience (Give specific details about the followings #)

- (i) Service delivery channels (Web, email, SMS etc.)

Open –free internet access, SMS advisory service for sericulture farmers on weather and technology adoption. Stand alone packs for limited needs of local requirements,

- (ii) Completeness of information provided to the users,

In one pack of 20 Modules, provision of information is made with respect to Planning, Spatial, Support Service and Farmers Service + SMS service for sericulture at district level available for users.

- (iii) Accessibility (Time Window),

Updated information available with user-friendly menu-driven tasks for queries.

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- (iv) Distance required to travel to Access Points,

Very little distance to internet point, as service at village level internet facility as open access for web based.SMS service to the mobile hand sets in local language(Assamese) for effective dissemination has been incorporated

- (v) Facility for online/offline download and online submission of forms,

All non-spatial data can be downloaded freely, Spatial data and map details based on query can be downloaded and printed.

- (vi) Status tracking,

Open source Hit counters at master site, and district level hit counters with feed back format for suggestions.

- 16. Result Achieved/ Value Delivered** to the beneficiary of the project-(share the results, matrices, key learning's, feedback and stakeholders statements that show a positive difference is being made etc):

- (i) **To organization**

41 District specific Potential Area Maps, four potential suitability grades (with Highly suitable, moderate, marginal and less suitable with limitations), Block wise villages identified under different classes of potentiality and Query based localized maps

- (ii) **To citizen**

Weather based agromet- advisory dissemination through SILKS portal, via SMS mode media to sericulture farmers, Sericulture advisory to sericulturists of three model districts. Dissemination technology packages on plant cultivation, rearing methodology, disease forecasting and subsidy schemes are made available in six local languages of the North East.

- (iii) **Other stakeholders**

Not applicable

- 17. Extent to which the Objective of the Project is fulfilled**-(benefit to the target audience i.e.G2G, G2C, G2B, G2E or any other, size and category of population/stakeholder benefited etc):

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G2G:08 States and 41 district sericulture offices can access the data of villages (block wise) and identify the specific areas required for potential sericulture expansion. District specific web page has been dedicated to sericulture.

G2C-1685 farmers provided with SMS advisory, updated information on technology packages, disease forewarnings, schemes for their benefits and periodic weather based forewarnings and advisories in six local languages

18. Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benefit, Change in legal system, rules and regulations

The project has benefited 41 North Eastern Districts with useful data on waste land suitability maps for sericulture in addition to SILKS information.

10879 acres of additional area covered under sericulture plantation took place since 2013 in North Eastern states and 8983 farmers took up plantation. Thus sericulture has emerged as a powerful tool for livelihood in the project area. (table.1.2)

Productivity increased by 30.37 kg silk/hectare in eri in North Eastern States in the year 2013-14 over 2012-13(table.1.3)

There has been a 39.64 % overall increase of silk production in these states in 2013-14 compared to 2011-12.

19. Other distinctive features/ accomplishments of the project:

Communication in local language of weather based and sericulture specific advisory for minimizing crop losses. Effective usage of RS & GIS knowledge for sericulture potential areas suitability, thus cutting cost and time, through conventional methodology adoption. There has been a first time integration and development of Technology, resources and service delivery at district level using SILKS. In that sense, this project has been a pioneering exercise.

This is just an indicative list of indicators. Applicant can add on more information based on suitability of the project nominated.

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