

XI. NAME OF CATEGORY- OUTSTANDING E-GOVERNANCE INITIATIVE BY ACADEMIC AND RESEARCH INSTITUTIONS

1. Coverage - Geographical and Demographic:-

(i) Comprehensiveness of reach of delivery centre:

The services are being promoted through Birsa Agricultural University, Ranchi Hq., Krishi Vigyan Kendras, State Agriculture Management & Extension Training Institute (SAMETI), Agricultural Technology Management Agency (ATMA) and Common Service Centres (Pragya Kendras).

(ii) Number of delivery centers:

Krishi Vigyan Kendras (KVKs)-22 No.
Agricultural Technology Management Agency (ATMA)-24 No.
Pragya Kendras- About 3000 No.

(iii) Geographical:

(a) National level - Number of State covered

Not Applicable (NA)

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

Jharkhand state in all the 24 districts

(c) District level- Number of Blocks covered Please give specific details:-

NA

(iv) Demographic spread (percentage of population covered):

Project was conceived in terms of catering to the information needs of the farmers of Jharkhand state. On an average 50 farmers and extension functionaries access information from portal. The details can be viewed in given figure.

Portal

1. Agriculture : 21, 670
2. Livestock : 5,860
3. Forestry : 2165

SMS

About- 2500

LCMS CDs

About 500 LCMS CDs were distributed to ATMAs, KVKs and NGOs for use in farmers' training programme.

Modus operandii for popularizing

A number of initiatives have been taken to make the services popular with the stakeholders:

- (i) Presentation in farmers' training programme
- (ii) Presentation in the local seminar/symposium and workshops.
- (iii) Synergy with Departments of Agriculture, Animal Husbandary and Information Technology.
- (iv) Popularization through electronic and print media

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

Project was conceived on the basis of literature and success of some of the IT initiatives in India and abroad. The analysis revealed that agricultural extension system was facing a number of constraints which are described as hereunder:

1. Unavailability of accurate and updated content in digital form.
2. Information was not delivered to every nook and corner of the state.
3. Disseminating real time information.
4. Lack of agricultural information in local languages.
5. Information dissemination in multimedia format.
6. Problems in getting feedback from the farmers.
7. Challenges in promoting services.

3. Scope of Services/ Activities Covered (Relevance of application for end users / citizens, extent of e-enablement in terms of number of services/ activities, extent to which step in each service/activity have been ICT- enabled #)

The project was conceived in the backdrop of existing problems and possible solutions through IT interventions. On line services were contemplated to be delivered through portal, SMS and IVRS and off line services through Learning Content Management System (LCMS) CDs. An integrated portal was developed on agriculture, veterinary and forestry domains.

Portal

- ✚ **Agriculture:** In agriculture, there are 14 modules viz. crop including varieties, soil health and land preparation, manures and fertilizers, water management, crop protection, agricultural implements, post-harvest and storage, finance, insurance, scheme, market, weather, FAQ and ask a question.
- ✚ **Veterinary:** Like agriculture, veterinary portal too has 14 modules. These are : Livestock, Reproductive management, Nutrition, Housing, General management, Health care, Loan facility, Government schemes, Product development, Marketing, Insurance, Project proposal, FAQ and Ask a question.
- ✚ **Forestry:** Forestry has nine modules viz. Plantation, Agro-forestry, Wasteland management, Watershed management, Medicinal plant, Non-timber forest product, Natural forest, FAQ and Ask a question.

SMS

- ✚ Guided SMS in local languages have been developed

IVRS

- ✚ Interactive voice response system (IVRS) for agriculture domain in Hindi language

LCMS

- ✚ Off line CDs using Ekalavya software has been developed on insect pest management in important crops, disease management in vegetable crops, pig management and medicinal plants.

4. Strategy Adopted

(i) The details of base line study done,

Information needs of the farmers were assessed through focused group discussion (FGD), a participatory tool. One focus group from each agro-climatic zone viz. Central North- eastern plateau (Zone-IV), Western plateau (Zone-V) and South eastern plateau (Zone-VI) was selected. The members of the groups were selected on the recommendation of Krishi Vigyan Kendras affirmed by Zonal Agricultural Research Stations. Farmers were called to University headquarter along with designated KVK scientist of the district. Focused group discussion was organized on a pre-decided date and time. The project scientist of headquarter moderated the discussion whereas KVK scientist facilitated. Workshop method was employed in respect of veterinary and forestry

(ii) Problems identified,

The identified information needs are presented in following table

Assessment of information needs of the farmers in respect of agriculture domain

| Sl. No. | Area of information | Specific area | Mode of presentation suggested | | | Rank |
|---------|-----------------------------------|---|--------------------------------|-------|-----------------------------|------|
| | | | Text | Image | Other | |
| 1. | Crop including varieties | General information about crop with economics | √ | √ | | 12 |
| | | Specific information about varieties with economics | √ | √ | | 6 |
| 2. | Soil health and field preparation | Fertility map of area | √ | √ | With fertilizer calculator | 8 |
| | | Types of tillage | √ | | | 13 |
| 3. | Manures and fertilizers | Organic | √ | | | 14 |
| | | Inorganic | √ | | With fertilizer calculator | 9 |
| | | Bio-fertilizers | √ | | | 15 |
| 4. | Water management | Amount of water required and critical stages | √ | | | 7 |
| 5. | Crop protection | Insect pest management with image of insect and damage | √ | √ | | 1 |
| | | Disease management with image of disease symptom | √ | √ | | 2 |
| | | Weed control with image | √ | √ | | 3 |
| 6. | Agricultural implements | Efficiency, cost , availability and image of implements | √ | √ | | 10 |
| 7. | Harvest and post-harvest | Stage of harvest and possible post-harvest management | √ | | | 11 |
| 8. | Market | Input and output market with current market price | √ | | Hyperlinking with AGMARKNET | 16 |
| 9. | Finance | Loan scheme, eligibility and amount | √ | | | 7 |
| 10. | Insurance | Scheme, eligibility, premium and risk covered | √ | | | 5 |
| 11. | Weather | Weather forecast and weather based suggestions | √ | √ | | 4 |
| 12. | Frequently asked questions | Natural resource management, production, protection and processing technologies | √ | √ | | 17 |

Assessment of information needs in respect of veterinary portal:

The information needs of the farmers were assessed in a workshop and in this backdrop modules were finalized which are: Livestock including breed description, Reproductive management, Nutrition, Housing, General management, Health care, Loan facility, Government schemes, Product development, Marketing, Insurance, Project proposal, FAQ and Ask a question.

Assessment of information needs in respect of forestry portal:

The information needs of the farmers were assessed in a workshop and in this backdrop modules were finalized which are: Plantation, Agro-forestry, Wasteland management, Watershed management, Medicinal plant, Non-timber forest product, Natural forest, FAQ and Ask a question.

(iii) Roll out/implementation model,

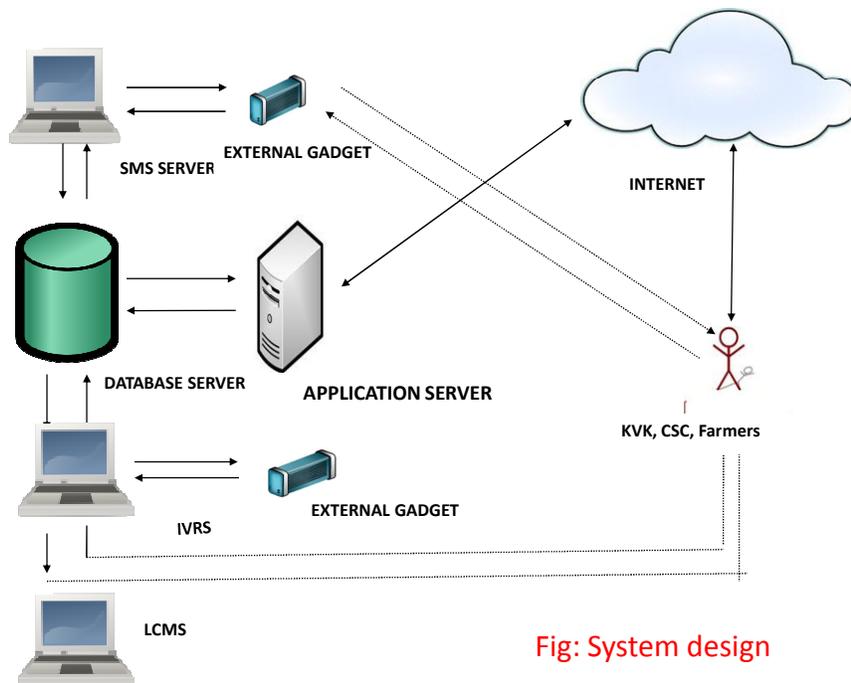


Fig: System design

(iv) Communication and dissemination strategy and approach used.):

A number of initiatives have been taken to make the services popular with the stakeholders:

- (i) Involvement of Pragma Kendras and Krishi Vigyan Kendras for facilitating use of portals by the farmers.
- (ii) Distribution of Guided SMS software and LCMS CDs through SAMETI, ATMA and Krishi Vigyan Kendras.
- (iii) Presentation in farmers' training programme.
- (iv) Presentation in the local seminar/symposium and workshops.
- (v) Synergy with Departments of Agriculture, Animal Husbandry and Information Technology.

5. Technology Platform used-

(i) Description :

For portal development, a number of software like relational database management system (RDBMS), programming language and supporting software have been used.

- (i) **RDBMS:** A RDBMS provides a comprehensive and integrated approach to information management. A DBMS that is based on relational model is called as RDBMS. Relational model represents data in the form a table. A table is a two dimensional array containing rows and columns. Each column contains the data related to a single attribute of the entity. MySQL version 5.0.51b has been used for storing data of agriculture portal. Relational database components include table, row, column, field, primary key and foreign key.
- (ii) **Programming language:** The programming language Java (JSP & Servlet) was used in the designing and development of portal. JSP uses simplified scripting language based syntax for embedding HTML into JSP. Its containers provide easy way for accessing standard objects and actions. It reaps all the benefits provided by JAVA servlets and web container environment, but they have an added advantage of being simpler and more natural programme for web enabling. With JSP, the logic to generate the dynamic content is kept separate from the static presentation templates by encapsulating it within external JavaBeans components. JSF has been used for veterinary and forestry portal.

(iii) **Supporting software:**

- **NetBeans:** It is a free, open-source Integrated Development Environment for software development. The NetBeans IDE provides support for several languages (PHP, JavaFX, C/C++, JavaScript, etc.) and frameworks. It can be run on most operating systems including Windows, Linux, Mac OS X and Solaris. With NetBeans one can develop applications for use via the desktop or on the web.
- **Dreamweaver:** Dreamweaver is easy to use software that helps in creating professional web pages. The design edition features of Dreamweaver allow to quickly add objects and functionality to pages, without having to programme the HTML code manually. It is possible to create tables, edit frames, work with layers, and insert JavaScript behaviors etc., in a very simple and visual way.
- **Tomcat:** Tomcat is a Java Servlet container and web server that dishes out web pages in response to requests from a user not only static HTML pages but also dynamic results. It provides both Java servlet and JavaServerPages (JSP) technologies. Tomcat is good choice for use as a web server for many applications. It can be used standalone or used behind traditional web servers with the traditional server serving static pages and Tomcat serving dynamic servlet and JSP requests.

(ii) Interoperability :

As mentioned earlier the system has been designed to cater to the requirement of different segment of users with varieties of technical capability and usability. Objective of the project is dissemination of information pertaining to Agriculture, Livestock & Forestry in local languages covering almost all available modes of communication for different types of users - a) Online, synchronous mode of delivery over computer :for users having access to computer with internet facility. b) Offline, Semi-synchronous mode of delivery over computer. for users having access to computer without internet facility c) Online, Asynchronous mode of delivery over mobile devices: for users having access to mobile devices instead of computer & internet. d) Online, synchronous mode of delivery over phone: for users who don't have the access/capability to collect information in textual mode but have access to Basic Telephone / mobile to collect information in voice-over mode.

From the above-mentioned description it is clear that the generalized design has potential to address interoperability issues amongst different technological dimensions. Mentioned four services have designed in editor-player mode to ensure interoperability from content management perspective. All services are developed on free and open source platform in object-oriented architecture to achieve maximum interoperability from technical perspective.

(iv) Security concerns :

The project "Web- enabled Access of Agricultural Information through PC and Mobile Devices" has four components - Web-portal service, SMS service, LCMS service and IVRS service built on new technologies. These new technologies and processes are changing the way IT teams think about security and protecting the integrity, usability, and reliability of their networks and web based applications.

Web-Portal Service

The Web-portal service is developed on Java EE technology alongwith MySQL database. There are a lot of potential risks and threats to deal with, but if proper security measures are implemented, the problem can be dealt with. Some of the potential threats are virus, worms, Trojans etc. Hackers can attack through SQL injection and JavaScript injection. Thus some preventive measures have been taken while developing the system.

Firstly, the portal has been developed using the JSF framework which is a multi-layered MVC architecture. Java EE allows one to protect web resources and JSF pages through declarative security. The JSF framework also allows security configuration beyond web pages to protect the local beans using managed bean methods.

One of the methods to overcome SQL injection is prepared statements. The root of the SQL injection problem is mixing of the code and the data. It works because we are adding data directly to the program body and it becomes a part of the program. So, the data may alter the program and depending on the data passed, we will have either regular output or tables and users may be dropped.

Prepared statements are resilient against SQL injection. Here we don't alter our program, it remains intact. We are sending program to the server first. Like we first send the query - `prepare("SELECT * FROM users where id=?");` where the data is substituted by some variable called "placeholder". That is the query is being sent to the server, without any data in it. And then we're sending the data with the second request, totally separated from the query itself: so, it cannot alter our program and do any harm.

JavaScript is a widely used technology within websites and web based applications. But along with this there are some additional security issues that need to be thought of. Using JavaScript an individual can modify and change existing information within a form. It can be used not only to change form input tags, but also the cookie's that are currently set in the browser, and any other value within a website or web application. Any type of parameter manipulation can typically be done with JavaScript injection.

To execute any JavaScript within a current session, a user would enter the specific JavaScript commands within the browser's address bar without the `http://` protocol. All JavaScript commands must start with the `JavaScript:` tag followed by any JavaScript command that will be executed. All JavaScript is ended with a `;` so a user can enter multiple JavaScript commands, as long as each command ended with the.

Measures have been taken to prevent JavaScript injection. One is validating the inputs against a white list. Secondly, a malicious user could modify and change the value anytime during the session. Thus the input is being validated every time and not just when the data is initially accepted. For example if a cookie is set, we need to make sure that cookie is the same value and it is correct on each and every request.

SMS and IVRS Service

Both the SMS and IVRS System are built on Linux standalone Servers. The servers run on user mode. They are set to startup and execute desired programs automatically in case of disruption. Logfiles are maintained in case of irregular performance. The only threat is the rootkit attack. In case there is a need to re-install or configure the system, it can be done by the administrator user.

LCMS Service

The LCMS Service is a CD based offline service. It can be installed and run on any standalone PC. Thus cyber security issues have not been considered.

- (v) Any issue with the technology used

The long term vision of the project is to convert traditional rural society into modern knowledge society resulting into enhanced agricultural productivity. To fulfil the objective with maximum usability the solution is implemented / launched in four non-correlated technological arrangements. a) Web Portal: for users having access to computer with internet facility. b) Auto installable LCMS CDs: for users having access to computer without internet facility c) SMS Server: for users having access to mobile devices instead of computer & internet. d) IVRS facility : for users who don't have the access/capability to collect information in textual mode but have access to Basic Telephone / mobile or capability to collect information in voice-over mode.

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

The university has the mandate of agricultural extension education whereby information is disseminated to the farmers. The service is provided free of charge. And, there is no as such Service Level Agreement with the farmers; however, MOU was signed with Service Centre Agency to take supply and services of BAU to the farmers.

6. Service Delivery- user orientation (Give details about improvement in interaction with end user and outcome, relevance of access points, Length and Breadth of services provided online etc. #)

Farmers are accessing services at Pragya Kendra which is situated in Village Panchayat. This has given a new dimension to agricultural extension. The content that

is delivered through internet is holistic i.e. agriculture, veterinary and forestry domains, the application of which has direct bearing on the economic development of the farmers. As far as the area where internet access is not possible, limited relevant information can be accessed through mobile.

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

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

For accessing information through internet, farmers need not come to city. They have to approach Pragya Kendra which are situated in their Village Panchayat. The Kendras are equipped with IT equipments and Internet connectivity. This saves a lot of time and cost for accessing information.

(ii) Feedback/grievance redressal mechanism

Feedback is obtained from extension functionaries and farmers both on line and off line.

(iii) Audit Trails,

Database table and column level Audit trails mechanism implemented in most of the services (excluding offline dissemination using LCMS CDs) to understand users behavior and requirement towards enhancement of the content or usability.

(iv) Interactive platform for service delivery,

Core engine of the solution designed based on assessment of requirements through several interactions with real users, domain experts and field workers. Moreover, regular analysis of audit data also helps to enhance the content and usability of the solutions.

(v) Stakeholder consultation

Stakeholders' consultation has been regular feature. Consultations were made during pre-development phase through brainstorming, meeting and workshop. During development phase field testing was done. During post project period a series of consultations have been made for integration and sustainability of the project.

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

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

There are four service delivery channels viz. internet, mobile, IVRS and LCMS CDs.

(ii) Completeness of information provided to the users,

The content has been developed taking into account completeness, presentation and understandability. The farmers' feedback has already been obtained on this issue.

(iii) Accessibility (Time Window),

Online services like internet, mobile and IVRS are available 24x7.

(iv) Distance required traveling to Access Points

Pragya Kendra is available in the village. So, farmers on an average need to travel between 0-3 km.

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

Facility for downloading has not been given; however, print option has been given. Farmers can print relevant content and forms for their use.

(vi) Status tracking

Not Applicable

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

(i)Volume of transactions processed,

The objective of the project is information access by the stakeholders and not transaction.

(ii) Coping with transaction volume growth

Not Applicable

(iii)Time taken to process transactions,

Not Applicable

(iv) Accuracy of output,

Not Applicable

(v) Number of delays in service delivery

Not Applicable

10. Accessibility

(Give details about how following has been enhanced: user accessibility, transparency in system, single-window resolution, ease of navigation; impact on service response time, number of visits required for accomplishing the task before and after automation, Communication e-mail, SMS, web based tracking, etc.#)

The information is accessible to every individual free of cost. The system has brought about transparency as information is in public domain and is available in local languages.

11. Innovations

(Give details on the extent to which initiative/project is unique in purpose/goal, compared to other common e-governance projects , give details about the new processes / new activities, new steps , ICT interventions, administrative process reforms, any use of new & emerging technology functionalities introduced into the system, identification & removal of any bottlenecks / give details irrelevant steps, Comparative with Original Project (Provide a comparative analysis about how is this project similar / different in services provided, design, functionality, technology, platform etc from the original project)

- (i) There is an integrated portal on agriculture, veterinary and forestry domains which are economically important enterprises of rural areas.
- (ii) The content is available in regional and tribal languages viz. Nagpuri, Santhali, Mundari, Kurukh and Ho besides Hindi and English.
- (iii) All modes of dissemination *i.e.* internet, mobile, IVRS and off line LCMS have been used.
- (iv) Guided SMS software has been developed on Java platform so that it can be transferred to low cost mobile sets.
- (v) Soil fertility map has been coded for all the 24 districts of Jharkhand so that a farmer can know exact fertilizer requirement of his field about the crop of his choice.
- (vi) An extension worker or farmer can diagnose pest and disease of his/her field and get the prescription of expert advice.
- (vii) The farmers can know weather forecast and weather based suggestions of his district.
- (viii) The farmers can know market rate of produce, licensed input dealers and veterinary doctors of his locality.

(ix) Besides above, the system has detailed information on agriculture, veterinary and forestry technology, finance, insurance and schemes.

12. Sustainability (Give details about Self sustainability of these w.r.t Institution (hiring trained staff, training etc.), financial (Scope for revenue generation), Saving of time and money etc. #)

In Context of sustainability, University has taken initiative to make the portal, guided SMS and IVRS developed under the project on **Web-enabled Access of Agricultural Information through PC and Mobile Devices** popular with the stakeholders of agricultural development viz. extension functionaries, Government Officials, farmers and Non-government Organisations and impress upon the Officials of Government of Jharkhand to support the services in terms of manpower and finance.

In a high level committee meeting of Project Monitoring Unit of NeGP chaired by Principal Secretary, Department of Information Technology, Government of Jharkhand, it was decided that :

- Maintenance of portal www.bau-eagriculture.com, Interactive Voice Response System (IVRS) and SMS based services should be made part of BAU Plan Budget as these are regular services.
- As far as manpower is concerned, Government of Jharkhand has provided staffs and work of up-gradation and inclusion of new contents has been started in BAU ICT lab.
- For popularization of service, a State-wide promotional project has been sanctioned under National Agricultural Development Project wherein interns of the University will take up IT-enabled services to the farmers.

Scope of revenue generation: The services have a lot of scope for revenue generation, but, the Government wants that services should be made available to the stakeholders free of cost.

Saving of time and money: The services are saving time and money of the stakeholders as the information can be accessed 24x7.

13. Adaptability Analysis

(i) Measures to ensure adaptability and scalability

Purpose of the implemented solution is to disseminate useful and up-to-date (real time in some of the cases e.g. weather forecast etc.) information pertaining to agriculture, livestock and forestry domain over local languages. Editor and Player based development of all services helps to bridge between the information provider and recipient with their existing knowledge and practical experience. Hence, the prime requirements like adaptability and scalability issues are handled properly as a part of the core architecture

(ii) Measures to ensure replicability

Technical solutions are independent development and have no issues on multiple installations or instances. Content nodes are loosely coupled with the system so authorized person can easily introduce a new domain, new language, enhance or reduce number of nodes, hierarchical levels and the content.

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

The projected solutions are home grown and entire development is based on free and open source platform, so there is no restriction in replication or scalability. Since the solution and content is an outcome of a collaborative project of BAU, Ranchi and CDAC, Kolkata and the project was funded by Deity, so replication will demand formal permission of the concerned institutions.

(iv) Risk Analysis

Content is the most important aspect of the solution. Hence only implementation of the technical solution without adequate relevant and useful content may dilute the objective of the replication.

13. 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

- (i) The developed system has been appreciated by the University Administration as it has given new dimension to agricultural extension.
- (ii) Department of Agriculture & Cane Development, Govt. of Jharkhand is providing tremendous support as over 50 % of proposed services are already available. Besides there are other services in this system which are beyond the scope of NeGP-A. The details are hereunder:

| Sl. No. | Service required under NeGP-Agriculture | | Services available in BAU | | | Remarks |
|---------|--|-----------------------------|---------------------------|---------------|------|---------|
| | Service | Description | Portal | Pull mode SMS | IVRS | |
| 1. | Information on pesticides, fertilizers and seeds | Good agricultural practices | √ | √ | √ | |
| | | Prevalent price | | | | |

| | | | | | | |
|----|--|---|---|---|---|------------------------------|
| | | Availability in area closest to the farmers | | | | |
| | | Dealer network | √ | √ | √ | |
| | | Quality control mechanism | | | | |
| | | Registration and licensing | | | | |
| | | Expert advice through multiple delivery channel | √ | √ | √ | |
| 2. | Providing information on soil health | Information on soil health | √ | √ | √ | |
| | | Package of practices | √ | √ | √ | |
| | | Balanced use of fertilizers | √ | √ | √ | |
| | | Automation of soil testing lab | | | | |
| | | Details of soil testing labs | | | | |
| | | Expert advice through multiple delivery channel | √ | √ | √ | |
| | | Results of frontline demonstrations | | | | Framework for KVK is present |
| 3. | Information on crops, farm machinery, training and Good Agricultural Practices | Information on agronomic practices | √ | √ | √ | |
| | | Machinery availability, quality and guidance | √ | √ | √ | |
| | | SMS based alerts on training calendar | | | | |
| | | Collecting, | √ | √ | √ | Information |

| | | | | | | |
|----|--|---|---|---|---|--|
| | | storing and indexing Good Agricultural Practices generated by farmers and research institutions | | | | of Research Institutions |
| 4. | Information on forecasted weather | SMS alert for District/Block | √ | √ | √ | |
| | | Agro-met Advisory | √ | √ | √ | |
| 5. | Information on prices, arrivals, procurement points and providing interaction platform | MSP | √ | | | |
| | | SMS based information on MSP | | | | |
| | | SMS alerts for prices | | | | |
| | | e-platform for marketing | √ | | | Hyperlinked with NCDEX |
| 6. | Electronic certification for exports and imports | Information on certification procedure | | | | |
| | | Automation of certification procedure | | | | |
| | | SMS based status alerts | | | | |
| 7. | Information on marketing infrastructure | Infrastructure at regulated market | | | | Hyperlinked with AGMARKNET |
| | | Post-harvest facilities at market yards | | | | Post-harvest processing relevant to farmers is present |
| | | Storage infrastructure | √ | | | Framework is there |
| | | Credit linkage | √ | | | Agricultural loan schemes with nearest branch detail |

| | | | | | | |
|----|---|---|---|---|---|---|
| | | | | | | is present |
| 8. | Monitoring, implementation/Evaluation of schemes and programmes | Information on schemes with respect to physical progress and fund utilization | | | | Information about Government Schemes relevant to farmers is present |
| | | Monitoring mechanism | | | | |
| | | Evaluation reports | | | | |
| 9. | Information on fishery inputs | Good practices | | | | |
| | | Fish production statistics | | | | |
| | | Registration | | | | |
| | | Expert advice | | | | |
| 10 | Information on irrigation infrastructure | Water release schedule | | | | |
| | | Best irrigation practices | √ | √ | √ | |
| | | Information on ground water | | | | |
| | | Availability and viability of tube wells | | | | |
| 11 | Drought Relief and Management | Past and present trends | √ | | | Data are available for Ranchi district but framework for other districts is present |
| | | Linking with SAC and NRSC | | | | |
| | | Drought Management Information System and linkages with Department of Space | | | | |

| | | | | | | |
|--|----------------------------|--|---|---|--|----------------------|
| 12 | Livestock Management | Information on livestock management | √ | √ | | |
| | | Availability of fodder in nearest region | | | | Framework is present |
| Additional Web-based information in BAU | | | | | | |
| I | Agricultural Expert System | | | | | |
| 1. | Finance | Loan Scheme | √ | | | |
| | | Nearest Branch | √ | | | |
| 2. | Insurance | NAIS | √ | | | |
| | | WBCIS | √ | | | |
| 3. | FAQ | Natural Resource Management | √ | | | |
| | | Production technology | √ | | | |
| | | Protection technology | √ | | | |
| 4. | Schemes of NGOs | Important NGOs | √ | | | |
| | | List of CSCs | √ | | | |
| II | Livestock Expert System | Animal/Poultry general description | √ | √ | | |
| | | Breed | √ | √ | | |
| | | Nutrition | √ | √ | | |
| | | Housing | √ | √ | | |
| | | Health | √ | √ | | |
| | | General Management | √ | √ | | |
| | | Reproductive Management | √ | √ | | |
| | | Government Scheme | | | | |
| | | Doctors list | | | | |
| | | Finance | | | | |
| III | Forestry Expert System | Natural Forest | √ | | | |
| | | Plantation forestry | √ | √ | | |
| | | Non-timber Forest Product | √ | √ | | |

| | | | | | | |
|--|--|-------------------------------|---|---|--|--|
| | | Agro-forestry | √ | √ | | |
| | | Wasteland Management | | | | |
| | | Watershed Management | | | | |
| | | Medicinal and Aromatic Plants | √ | √ | | |

(ii)To citizen

The farmers that were invited in focused group discussion (FGD) were invited to give their feedback on presentation, completeness and understandability of developed portal. Participants were given proforma to tick whether the page looks good, whether the information is complete and whether the information is understandable. Accuracy and brevity test were done by the project team scientists. Different modules of the portal that constituted area of information were presented before the participants through projector.

Table : Feedback of selected farmers on agriculture portal

| Sl. No. | Area of information | Presentation | Completeness | Understandability |
|---------|---|--------------|--------------|-------------------|
| 1. | General information about crop with economics | 24 (80.0) | 24 (80.0) | 28(93.3) |
| 2. | Specific information about varieties with economics | 24 (80.0) | 24 (80.0) | 29(96.6) |
| 3. | Fertility map of area | 28(93.3) | 28(93.3) | 30(100) |
| 4. | Types of tillage | 25(83.3) | 25(83.3) | 28(93.3) |
| 5. | Organic manures | 24 (80.0) | 24 (80.0) | 26(86.6) |
| 6. | Inorganic fertilizers | 26(86.6) | 26(86.6) | 29(96.6) |
| 7. | Bio-fertilizers | 25(83.3) | 25(83.3) | 28(93.3) |
| 8. | Amount of water required and critical stages | 26(86.6) | 26(86.6) | 29(96.6) |
| 9. | Insect pest management with image of insect and damage | 29(96.6) | 29(96.6) | 30(100) |
| 10. | Disease management with image of disease symptom | 30(100) | 30(100) | 30(100) |
| 11. | Weed control with image | 28(93.3) | 28(93.3) | 28(93.3) |
| 12. | Efficiency, cost , availability and image of implements | 28(93.3) | 28(93.3) | 30(100) |

| | | | | |
|---|---|-----------|-----------|----------|
| 13. | Stage of harvest and possible post-harvest management | 24 (80.0) | 24 (80.0) | 25(83.3) |
| 14. | Input and output market with current market price | 29(96.6) | 29(96.6) | 28(93.3) |
| 15. | Loan scheme, eligibility and amount | 28(93.3) | 28(93.3) | 30(100) |
| 16. | Scheme, eligibility, premium and risk covered | 29(96.6) | 29(96.6) | 30(100) |
| 17. | Weather forecast and weather based suggestions | 30(100) | 30(100) | 29(96.6) |
| 18. | Natural resource management, production, protection and processing technologies | 25(83.3) | 25(83.3) | 29(96.6) |
| Feedback on veterinary and forestry portal | | | | |
| The process is going on. | | | | |

(iii)Other stakeholders

Extension workers of State Department of Agriculture, ATMAs and NGOs are increasingly using the services in agricultural extension.

15. 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):

All the project objectives have been fulfilled as far as development of product/services is concerned. As far as use of services and benefit to the target audience is concerned, following systems are available :

- (i) G2G: Out of 12 services identified under NeGP-A, over 50 % services are available which the Government will be using.
- (ii) G2C: Farmers and extension functionaries are accessing internet service at Pragma Kendra and SMS and IVRS service from their mobile sets.

16. Comparative Analysis of earlier Vs new system with respect to the BPR, Change

Management, Outcome/benefit, Change in legal system, rules and regulations

The comparative analysis is hereunder:

| Parameter | Earlier system | New system |
|--|---|---|
| BPR | Farmers were accessing information in supply mode | Farmers were accessing information in demand mode |
| Change Management | University did not have any IT Committee | Now IT Committee has been formed |
| Outcome/benefit | Dissemination of agricultural information through publications, TV and Radio | Dissemination of agricultural information through internet, SMS, IVRS and LCMS as complementary/supplementary to earlier system |
| Change in legal systems, rules and regulations | Extension Education is the mandate of the University. Various technologies and methodologies can be employed. | As such there is no restrictions in adopting IT based services |

17. Other distinctive features/ accomplishments of the project

1. The project has been appreciated by State Government
2. The project has got attention of print and electronic media
3. The project was finalist of Manthan Award Organisation and got Certificate of Appreciation
4. The project has been selected for Skoch Award 2014