



Department of Agriculture & Cooperation  
Ministry of Agriculture  
Government of India

2012



## Agricultural Mission Mode Project under National e-Governance Plan

### Central Agricultural Portal Software Requirement Specifications Version 1.0

Based on "Guidelines for the Indian Government Websites"  
<http://web.guidelines.gov.in/>



Agricultural Informatics Division  
National Informatics Centre  
Department of Electronics & Information Technology  
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## 1 Introduction

### 1.1 Background

The Department of Agriculture and Cooperation (DAC), Ministry of Agriculture is implementing National e-Governance Programme (NeGP) in the Agricultural Sector as a Mission Mode Project (A-MMP), covering Agriculture Sector, Livestock Sector and Fisheries Sector. (Organisation Structure of Ministry as given in Annexure – E). The NeGP-AMMP aims to address the needs of the farming community and its other related stakeholders, through provision of relevant information and services through the various delivery channels available in their vicinity for assisting them in making rational decision for raising farm productivity and farm income.

In first Phase project will be implemented in 7 pilot states. These are Assam, Himachal Pradesh, Maharashtra, Madhya Pradesh, Jharkhand, Kerala and Karnataka. The project will be rolled out in other states after successful implementation in first phase.

12 Cluster of Services identified under this project, will cover information on Pesticides, Fertilizers and Seeds, Soil Health, crops, farm machinery, training and Good Agricultural Practices (GAPs), forecasted weather and agro-met advisory, prices, arrivals, procurement points, and providing interaction platform, Electronic certification for exports & imports, marketing infrastructure, Monitoring implementation / Evaluation of schemes & programs, fisheries, irrigation infrastructure, Drought Relief and Management, Livestock Management.

NIC has been given the responsibility of Software design, development, deployment and training under this project. Software component includes design and development of (i) Central Agricultural Portal (CAP), (ii) 7 States Agricultural Portals (SAPs) (iii) 12 clusters of information services.

**Central Agricultural Portal** is at the centre stage of the project as it will provide platform for all stakeholders (farmers, private sector and the Government, research scholars) to access information, avail services, collaborate and share knowledge.

It would play a critical role in providing single access point to government information and services related to agricultural sector, eliminating the need to navigate multiple web sites and applications. The CAP would allow to present information, applications and services in a single consolidated browser view. It would provide a secure and individualized view of multiple online resources and interactive services. In this sense, the CAP would become an interface between the government and other stakeholders.

## 1.2 Purpose of the document

This document describes the Software Requirements Specification for the Central Agricultural Portal (CAP). The Purpose of this document is to provide guidelines for the development of the Central Agricultural Portal.

## 1.3 Scope

The Scope of this SRS document is to define the functional requirements for Central Agricultural Portal and its component like User management, Content management, Expert Advisory System, Grievances Redressal and Management System, National Farmers' database, etc. It also defines user interfaces, user characteristics, sitemap, navigation etc. for the portal.

It also covers the non-functional requirements like performance, reliability, availability, security, maintainability etc.

## 1.4 Existing System

With emergence of new and cost effective solutions in Information and Communications Technology field, traditional methods for information access and service delivery are either becoming obsolete or it has become necessary to augment these methods with the new ICT tools. As the ICT is spreading its wings at the grassroots level, more and more population is becoming aware of the benefits of ICT. Their expectations about the service delivery from Government are increasing. They expect sophistication, timeliness and easy accessibility (anytime, anywhere) in service delivery. Agricultural Sector is one of the most important sectors in India as it contributes 16% GDP and provides employment to 52% of the Indian population. Timely access to information and service delivery is critical and of utmost important in this sector in view of time bound farm activities involved in all stages of the crop cycle.

To fulfill the expectations of the farm sector for provision of timely access of information and services, many e-Governance initiatives have been started in past few years, by Government as well as by Public and Private sectors. Under these initiatives, large number websites providing information and services in agricultural sector have been launched. Ministry of Agriculture itself has number of websites for different divisions, directorates and projects. There have been many websites and portals published by Central Government Departments (Agriculture, Irrigation, Fertilisers, Cooperation, ICAR, DADF, Planning Commission, Commerce, Agencies , Public Sector Banks, NABARD, etc), State Government Departments (Sub-sectors), State level Agencies, Commodity wise portals, NGOs, CMIE, etc.

The partial list of these have been provided in the Annexure-A. However these websites do not share web services among them and hence contents are static, non-consistent, non-integrity etc. Many times farmer and other stakeholders in the agricultural sector have to visit multiple websites to trace the desired piece of information or to avail a single service. Different websites have different look and feel, presentation style, structure, and color schema as these follow different technology standards, design lay-outs and navigation architecture etc. It results in lot of inconvenience to the user and requires a lot of learning on their part to access the information and services. On the other hand it is challenging job for the owners of these websites also to keep all the information updated and in sync at multiple websites all the time. This results in duplicate efforts, outdated content, multiple sources of information, mismatch of the information finally confusing the service consumer. Following problems are being faced by information and service providers in agricultural sector-

1. Vast content and content types
2. Large geographical area, different types of cultural and socio-economic conditions of the farmers and other stakeholders, hence varied requirements of types of information and services
3. Lack of standardized processes at State level
4. No clarity on roles and responsibilities
5. No IT enablement of background processes
6. Non availability of means for making content timely available
7. Lack of resources in generating content in digitized formats in English and local languages
8. Content mainly stored as manual record
9. Lack of standardized formats at the state level
10. Lack of adequate dissemination channel / training programs
  - a. Lack of trained manpower
  - b. Large number of villages
11. Lack of decoupling between the services from the core administration barring the service delivery mechanisms to incorporate changes without triggering changes in core processes and the Centre / State / District Agriculture Department and Attached offices.
12. Lack of one comprehensive data repository resulting in:

- a. Duplication of effort
- b. Redundancy in the processes
- c. No / difficult access to inter-departmental data
- d. More requirements for verifications

To make all the Agricultural information and services accessible in easy and convenient manner, a need has been felt to establish a one-stop source for all government information and services in Agricultural Sector. It will save farmers and other stakeholders from the hassles of searching the desired information across a large number of websites, with diverse design and navigation patterns.

Providing relevant information and services to all stakeholders in this sector especially to the farming communities is the major objective of the NeGP- Agriculture Mission Mode Project. Central Agricultural Portal will be the main gateway to provide these services.

## 1.5 Objectives of Central Agricultural Portal

The major objectives of Central Agricultural Portal are –

- To provide **one stop, single window solution** to all stakeholders especially farmers for accessing information and services in agricultural sector eliminating the need to remember multiple URL and to navigate multiple web sites and applications
- To provide **localized** and **personalized** services for agricultural related information.
- To act as a **gateway for delivery of information and services** in Agricultural sector which will be accessed using various delivery channels
- To deliver agricultural related government services in **integrated** fashion
- To complement and enhance service delivery channels which may already exist at the central government level
- To build a **comprehensive Knowledge Management system** for Indian Agriculture by providing platform to collaborate and share knowledge
- To act as **bridge between farmers and the Government bodies** at the highest decision making level by streamlining and simplifying their interactions with Government entities reducing service cycle time and providing enriching experience
- To provide mechanism for **grievance redressal and management** in agricultural sector

- To provide **Expert Advisory services** to the farmers during each stage of the entire crop cycle while on the other hand to provide the platform for the domain experts to receive and address specific queries of the farmers
- To build **National Farmers' database** to understand the information requirements of the farmers and to provide relevant services through various delivery channels.
- To provide **secure, anytime, anywhere**, single window delivery of government services to **agri-business industry** comprising of dealers, wholesalers, retailers of the agricultural inputs and exporters, importers, traders of the agricultural products. To streamline and simplify their interactions with Government entities reducing service cycle time and providing enriching experience
- To **minimize gaps** between Service providers(Government entities) and service consumers (farmers, Agri-businesses)
- To provide **consistent and uniform experience** to users in terms of presentation, standards, design, layouts, navigation architecture
- To built **platform for Government departments to present information, applications and services** in a single consolidated browser view
- To provide a secure and individualized view of multiple online resources and interactive services
- To **house the applications** suggested for use at the Central levels
- To support four forms of interactions G2F, G2C, G2B, G2G

## 1.6 Salient Features of the Central Agricultural Portal

The focus of the CAP is farmer and as most farmers are not experienced Internet users, to find the relevant information and services on portal should be easy for them. As such, the following is a list of proposed features for the CAP:

- **Single window access** of Information and services in Agricultural Sector in India for farmers and other stakeholders
- **Use of icons/pictures/ images and graphical interfaces** to represent links and information for quicker understanding of the farmers.
- **Alternate lighter Home page** and alternate text display for icons/pictures/images for faster access depending upon connectivity speed.

- **Consistent and Easy to Use interface**- Consistent design of the web pages for common look and feel. Design in way so that the desired document can be traced in maximum 3 clicks.
- **Easy to navigate, search and browse**- Site map and bread crumbs for navigation guidance
- **Personalization/Customization** of the content based on the user's individual profile and preferences (MyAgri - personalized look).
- **Adaption of the look** highlighting contents of importance as per **the location of the user, crop and current stage of crop life cycle as per season**.
- **Interface for the updation of information and service delivery** for departments, SAUs and KVK.
- **Well designed home page** conveying theme and purpose. **Aesthetic and Ergonomic** design.
- **Multi-Lingual support** – for farmers to access the information in his own language.
- **Single Sign-on** to access all information and services on the portal.
- **Self service**- Interface to user to set/reset his/her own password. The portal should allow the user to fulfill his needs, wherever possible, through self-service.
- **Digital Dashboards** to display key information on a single screen and allow an overall idea of the current agricultural scenario in the country/state
- **Discussion Boards** - to allow all kinds of users like farmers, experts, government officers, Agricultural University faculty/scientists, Students, Research Scholars etc. to interact with each other with provision of discussion moderator appointed by DAC.
- **Comprehensive Content Management System** to provide accurate and up-to-date content with a farmer-orientation. Role based access for designated Content Management officers of the govt.
- **Grievance Management System** – Facility to register grievances of the stakeholders in agricultural sectors.
- **Expert Advisory System** – integrated with Kisan Call Centre set up by DAC and backed by comprehensive Knowledge Management System built under it.

- **Feedback and Analysis mechanism** – for constant improvement and enrichment of the portal for user satisfaction
- **Search** - A Search feature for user to find the relevant information or service on portal.
  - Search within the Portal as well as on external resources like Google
  - Search based on Key Words
- **Alerts**- Provision for user to receive SMS and e-mail alerts, based on the preferences entered by him/her while registering on the CAP.
- **Blogs**- A blog feature for user to share interesting stories and innovations with provision of moderator appointed by DAC.
- **Screen reader compatible web pages** – Web pages will be designed to be compatible with commonly available screen readers. On Mouse Over on a tab, the contents should be spoken out loud for links wherever possible as is done in <http://www.apagrisnet.gov.in>. Since many farmers are semi-literate or illiterate in India, hence this will immensely help such farmers. Even literate farmers may prefer to have the contents read out loud to assist in quicker reading.
- Cross platform browsers support
- **Picture gallery** Extension Training Aids ( Audios/Videos/ pictures)
- State-of-the-art tools and technologies at the backend in a world class hosting environment ensuring a fast and secure 24\*7 access.

## 1.7 Definitions and Abbreviations

AAY	Antyodaya Anna Yojana
ACL	Access Control List
ADB	Asian Development Bank
ADO	Agriculture Development Officer
AGMARKNET	Agricultural Marketing Information System Network
AgRIS	Agricultural Resources Information System
AGRIS	International System for Agricultural Science and Technology
AGRISNET	Agricultural Information Systems Network
AICRP	All India Coordinated Research Project
AIFF	Audio Interchange File Format

AMFU	Agro-Meteorological Forecasting Unit
AMMP	Agriculture Mission Mode Project
APEDA	Agricultural and Processed Food Products Export Development Authority
API	Application Programming Interface
APL	Above Poverty Line
APMC	Agricultural Produce Marketing Committee
APY	Area, Production, Yield
ASF	Advance System Formats
ASP	Active Server Pages
ATAG	Authoring Tool Accessibility Guidelines
ATMA	Agriculture Technology Management Agency
AU	Audio File Format
AVI	Audio Video Interleave
BAO	Block Agriculture Officer
BC	Backward Class
BPEL	Business Process Execution Language
BPL	Below Poverty Line
CAB	Centre for Agricultural Banking
CACP	Commission for Agricultural Costs and Prices
CAP	Central Agricultural Portal
CAPART	Council for Advancement of People's Action and Rural Technology
CAPTCHA	Completely Automated Public Turing Test to tell Computers and Humans Apart
CAU	Central Agricultural University
CAZRI	Central Arid Zone Research Institute
CCBF	Central Cattle Breeding Farm
CCI	Cotton Corporation of India
C-DAC	Centre for Development of Advanced Computing
CEST	Customs, Excise and Service Tax
CFQCTI	Central Fertilizer Quality Control & Training Institute
CFSPT	Central Frozen Semen Production and Training
CGWB	Central Ground Water Board
CIBRC	Central Insecticides Board & Registration Committee
CIFT	Central Institute of Fisheries Technology
CIL	Central Insecticides Laboratory
CIPMC	Central Integrated Pest Management Centres
CLI	Caller Line Identification
CMFRI	Central Marine Fisheries Research Institute
CMS	Content Management System
COM	Component
COTS	Commercial Off The Shelf
CPCRI	Central Plantation Crops Research Institute
CPU	Central Processing Unit

CQL	Contextual Query Language
CRIDA	Central Research Institute for Dry land Agriculture
CROP	Computerized Registration of Pesticides
CRUD	Create, Read, Update, Delete
CSC	Citizen Service Centre
CSS	Cascading Style Sheet
CWC	Central Water Commission
DAC	Department of Agriculture and Cooperation
DADF	Department of Animal Husbandry, Dairying and Fisheries
DAO	Data Access Object
DAP	Data Access Object
DAR&PG	Department of Administrative Reforms and Public Grievances
DARE	Department of Agricultural Research and Education
DB	Database
DBMS	Database Management System
DBT	Department of Bio-Technology
DC	Dublin Core
DCMI	Dublin Core Metadata Initiative
DDA	Deputy Director Agriculture
DeitY	Department of Electronics and Information Technology
DES	Directorate of Economics & Statistics
DGCIS	Directorate General of Commercial Intelligence and Statistics
DMI	Directorate of Marketing & Inspection
DMS	Delhi Milk Scheme
DMZ	De-Militarized Zone
DPI	Dots per Inch
DPPQS	Directorate of Plant Protection, Quarantine & Storage
DPR	Detailed Project Report
DR	Disaster Recovery
DRDO	Defence Research and Development Organisation
DSS	Decision Support System
DTD	Document Type Definition
EAP	Expert Advisory System
ebXML	Electronic Business using eXtensible Mark-up Language
EEI	Extension Education Institutes
EMII-DCF	European Museums' Information Institute - Distributed Content Framework project
EPC	Export Promotion Councils
E-R Diagram	Entity Relationship diagram
ESA	Economics and Statistical Advisor
ESB	Enterprise Service Bus
FAO	Food and Agriculture Organization of the United Nations
FAQ	Frequently Asked Questions

Favicon	Favorite Icon
FCI	Food Corporation of India
FMC	Forward Market Commission
FRS	Functional Requirement Specifications
G2B	Government to Business
G2C	Government to Citizen
G2F	Government to Farmer
G2G	Government to Government
GAPs	Good Agricultural Practices
GDP	Gross Domestic Product
GIF	Graphical Interchange Format
GIS	Geographic Information System
GMP	Good Management Practices
GoI	Government of India
GRMS	Grievance Redressal and Management System
GUI	Graphical User Interface
HCF	Highest Common Factor
HS codes	Harmonised Codes
HTML	Hyper Text Mark-up Language
HTTP	Hyper Text Transfer Protocol
HTTPS	Secured Hyper Text Transfer Protocol
IAM	Identity and Access Management
IASRI	Indian Agricultural Statistics Research Institute
ICAR	Indian Council of Agricultural Research
ICT	Information and Communications Technology
ID	Identity
IDRC	International Development Research Centre
IGPB	Indian Grape Processing Board
IICPT	Indian Institute of Crop Processing Technology
IMD	Indian Meteorological Department
IOM	Institute for Ocean Management
IPM	Integrated Pest Management
ISO	International Standards Organisation
ISRO	Indian Space Research Organization
IVRS	Interactive Voice Response Service
JCI	Jute Corporation of India
JDBC	Java Database Connectivity
JPEG	Joint Photographic Expert Group
JSP	Java Server Pages
KCC	Kissan Call Centre
KKMS	Kissan Knowledge Management System
KVK	Krishi Vigyan Kendra

LBS	Location based services
LCM	Least Common Multiple
LDAP	Lightweight Directory Access Protocol
LR	Large Ruminant
LWO	Locust Warning Organization
MANAGE	National Institute of Agriculture Extension & Management
MCX	Multi Commodity Exchange of India
MDDS	Metadata and data standards
MICR	Magnetic Ink Character Recognition
MIS	Management Information System
MMAP	Mobile Message Access Protocol
MMP	Mission Mode Project
MP3	MPEG-1 or MPEG-2 Audio Layer III
MPEDA	Marine Products Exports Development Authority
MPEG	Moving Picture Experts Group
MSDG	Mobile Service Delivery Gateway
MSDP	Mobile e-governance Services Delivery Platform
MSME	Micro, Small and Medium Enterprises
MVC	Model, View, Controller
NABARD	National Bank for Agriculture and Rural Development
NABI	National Agri-Food Biotechnology Institution
NAIP	National Agricultural Innovation Project
NARS	National Agricultural Research System
NBM	National Bamboo Mission
NBSSLUP	National Bureau of Soil Survey and Land Use Planning
NCDEX	National Commodity & Derivates Exchange Limited
NCIPM	National Centre for IPM
NCMRWF	National Centre for Medium Range Weather Forecasting
NCOF	National Centre for Organic Farming
NDC	National Data Centre
NeGP	National e-Governance Programme
NFDB	National Fish Development Board
NGO	Non-Governmental organization
NHM	National Horticulture Mission
NIAB	National Institute of Animal Biotechnology
NIC	National Informatics Centre
NIFTEM	National Institute for Food Technology & Entrepreneurship Management
NIPGR	National Institute Of Plant Genome Research
NMPPB	National Meat and Poultry Processing Board
NPR	National Population Register
NRAA	National Rainfed Area Authority
NRSC	National Remote Sensing Centre

NSAI	National Seed Association of India
NSC	National Seeds Corporation
NSDG	National Service Delivery Gateway
OAI PMH	Open Archives Initiative Protocol for Metadata Harvesting
OBC	Other Backward Class
ODBC	Open Database Connectivity
ODF	Open Document Format
OWASP	Open Web Application Security Project
PACS	Primary Agricultural Cooperative Society
PDA	Personal Digital Assistant
PDF	Portable Document Format
PNG	Portable Network Graphics
PoPs	Package of Practices
PQIS	Plant Quarantine Information System
PSU	Public Centre Unit
QCA	Quality Control and Assurance
QoS	Quality of Service
R2MF	R2 Line Signalling Multiple Frequency (interfacing protocol between IVRS and Switch/EPABX)
RA	Real Audio
RAID	Redundant Array of Inexpensive Disk
RBI	Reserve Bank of India
RDBMS	Relational Database Management System
RDF	Resource Description Framework
RKVVY	Rashtriya Krishi Vikas Yojana
RMC	Regulated Marketing Committees
RPO	Recovery Point Objective
RPPQS	Regional Plant Protection and Quarantine Stations
RSS	Really Simple Syndication
RTGS	Real Time Gross Settlement
RTGS	Real Time Gross Settlement
RTO	Recovery Time Objective
SAARC	South Asian Association For Regional Cooperation
SAMB	State Agricultural Marketing Boards
SAMETI	State Agricultural Management and Extension Training Institute
SAP	States Agricultural Portal
SASA	State Agricultural Statistics Authority
SAU	State Agricultural University
SC	Scheduled Caste
SCC	State Call Canters
SDC	State Data Centre
SFCI	State Farm Corporation of India

SGML	Standard Generalized Markup Language
SHG	Self Help Group
SMIL	Synchronized Multimedia Integration Language
SMPP	Short Message Peer-to-Peer Protocol
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SPIFF	Still Picture Interchange File Format
SQL	Structured Query Language
SR	Small Ruminants
SRS	Software Requirements Specifications
SS7	Signalling System 7 (interfacing protocol between IVRS and Switch / EPABX)
SSC	State Seeds Corporation
SSCA	State Seeds Certification Agency
SSDG	State Service Delivery Gateway
SSL	Secured Socket Layer
SSO	Single Sign On
ST	Scheduled Tribe
STQC	Standardisation Testing and Quality Certification
SVG	Scalable Vector Graphics
SWAN	State Wide Area Network
SWC	State Warehouse Corporation
TCP/IP	Transmission Control Protocol / Internet Protocol
TIFF	Tagged Image File Format
TOGAF	The Open Group Architecture Framework
TSP	Telecom Service Providers
UAAG	User Agent Accessibility Guidelines
UDDI	Universal Description Discovery and Integration
UI	User Interface
UID	Unique Identification
UIDAI	Unique Identification Authority of India
UML	Unified Modeling Language
UNDP	United Nations Development Programme
URI	Uniform Resource Identifier
URL	Universal Resource Locator
USB	Universal Service Bus
USSD	Unstructured Supplementary Service Data
UTF	Unicode Transformation Format
VPN	Virtual Private Network
W3C	World Wide Web Consortium

WAN	Wide Area Network
WAP	Wireless Access Protocol
WAV	Waveform Audio File Format
WCAG	Web Content Accessibility Guidelines
WDRA	Warehousing Development and Regulatory Authority
WMA	Windows Media Audio
WML	Wireless Markup Language
WMV	Windows Media Video
WSDL	Web Services Description Language
XHTML	eXtensible HyperText Markup Language
XML	Extensible Markup Language
XSL	Extensible Style sheet Language
ZREAC	Zonal Research Extension and Advisory Committee

## 1.8 References

1. Detailed Project Report for Agriculture Mission Mode Project under National e-Governance Plan
2. Web Content Accessibility Guidelines (WCAG) 2.0 by W3C. (<http://www.w3.org>)
3. MDDS – Demographic (Person Identification and Land Region Codification) Metadata and data standards by DeitY. (<http://egovstandards.gov.in/>)
4. “Guidelines for the Indian Government Websites” developed by National Informatics Centre (NIC), DeitY and adopted by Department of Administrative reforms and Public Grievances (DARPG) (<http://web.guidelines.gov.in/>)
5. Content Framework for the National Portal of India, National Informatics Centre
6. <http://www.nsdg.gov.in>
7. <http://www.mit.gov.in>
8. Report on using Mobile e-Governance Service Delivery Platform (MSDP) to deliver citizen centric services over Mobile
9. MSDP-SMS Integration Document – Departments document by C-DAC
10. State Portal Framework Version 1.0, National Informatics Centre
11. Saaransh - A compendium of Mission Mode Projects under NeGP by Department of Electronics and Information Technology, Ministry of Communications and Information Technology, Government of India
12. Report of the Sub-Group-5 of the Committee on Statistics of Agriculture and Allied Sector - IT and IT Usage in Agriculture Data, Agro-Climatical level and Small Area Farm Business
13. Technical Guidelines for Digital Cultural Content Creation Programmes: Minerva Technical Guidelines 2.0
14. <http://agris.fao.org>

15. Websites and Portals of both Central and State Governments, NGOs, Commodity Boards, PSUs, NABARD, ICAR Institutions, Universities, etc
16. Agripedia of IIT Kanpur under NAIP
17. NAIP assisted ICT projects' Portals
18. "Institutional Mechanism for Formulation of Domain specific Metadata and Data Standards in e-Governance, eGSI-IM:02, Version 1.0, April 2012, Government of India, Ministry of Communications and Information Technology, Department of Electronics and Information technology, New Delhi- 11003
19. National Portal of India – Software Requirement Specifications

## 1.9 Overview Structure of the Document

This document is organized in **Seventeen Chapters** and **Five Annexure**.

**Chapter 1** gives the introduction describing purpose and scope of the document. It provides objectives and features of the Central Agricultural Portal. It also discusses about Existing systems in detail. It lists abbreviation and references and gives overview of the document.

**Chapter 2** provides Overall Description of the Central Agricultural Portal. It gives product perspective. Context diagram has been depicted. It also talks about System interfaces, User interfaces, Hardware and Software interfaces, User Characteristics, Constraints, Assumptions and Dependencies. Major product functions are listed out. Component Architecture and Layered Architecture have been depicted pictorially as well as described layer wise in detail. Logical view of the portal has been provided and entities in each layer have been described. Integration view of the portal has been given pictorially and approach for integration has been discussed. Data view of the portal has also been depicted.

**Chapter 3** describes specific requirements of the Central Agricultural Portal. It gives overview of the home page in pictorial form. Each link on the home page has been illustrated. It also gives user interfaces as envisaged for all components of the 12 services.

**Chapter 4** Describes Content Management System (CMS) of the Central Agricultural Portal. It illustrates System Architecture for CMS. It also lists and describes major components of CMS. It speaks about features, capabilities and functionality of CMS. It describes Life cycle, Taxonomy, Meta data, Categories, Formats, Contribution sources of the content and roles and responsibilities of the content contributing organisations. It gives functional requirements, use case diagrams and use cases for the CMS. Content sharing workflow between CAP and SAPs has been depicted. User interfaces of the CMS have been depicted for the better understanding of the system.

**Chapter 5** Gives details about Identity and Access Management (IAM) for the Central Agricultural Portal. It provides detail description of IAM along with Framework. It also provides Identity classification based on various criteria. It lists components of IAM and provides description of each component. Identity Life Cycle Management has been depicted and described. User Management has been illustrated. Functional requirements and modules for user management have been described. Use case diagrams and Use cases describing each artifact for user management have been provided.

**Chapter 6** provides detail description of Grievances Redressal and Management System (GRMS). Various existing Systems already implemented for GRMS at Central, State and District level have been discussed here and comparative analysis has been provided. Scope of GRMS has been discussed. Service wise list of possible grievances has been worked out. Proposed solution has been described. Design Architecture and Process flow has been depicted. Workflow diagram, E-R diagram, Functional Requirement, Use Case diagram and Use cases have been depicted and discussed in details. The user interfaces have been provided to get the better idea about the system.

**Chapter 7** Expert Advisory System (EAS) has been discussed in detail. Farm advisory services needed by Crop, Livestock and Fisheries farmers have been listed out. Information about Kisan call Centre has been included and its linkage to proposed EAS system has been discussed for integration. Proposed System has been described and process flow of the system has been included. Functional Requirements of the system has been included. Use case diagram and use cases have been deliberated. The user interfaces have been included for visualization.

**Chapter 8** portrays National Farmer's Database. It lists out all characteristics (HCF and LCM of characteristics) of the Farmer entity to get 360 degree view of farmer. It has static information (Information that change occasionally) and dynamic information (information that changes often over certain period of time for e.g. yearly). Integration with various types of databases and standards to be used has been discussed. Entity Relationship diagrams and user interfaces have been provided for more clarity about the system.

**Chapter 9** talk about Functional Requirements of common modules across all the applications of NeGP-Agriculture Mission Mode Project like printing, MIS reports, SMS management, e-mail management, Payment Gateway. It also describes common use case for artifacts such as Create/Modify Language Pack, Switch Language, Manage alerts.

**Chapter 10** deliberates Design Constraints. It describes design objectives, design considerations for quality of code, Degree of separation between content and presentation, Accessibility for users, Accessibility for devices, Basic usability and Site management. It also gives the list of standards to be adopted while implementing Central Agricultural Portal and NeGP-Agriculture Mission Mode Project as a whole.

**Chapter 11** describes performance requirements. It also gives guidelines for achieving high performance.

**Chapter 12** lists out portal functionality requirements

**Chapter 13** discusses Software Systems attributes like high availability, scalability, interoperability, reliability, usability, portability, extensibility, maintainability, essential components of Accessibility, Multi-lingual support, Security (System Software Level Security, Application Software Level Security, Database level security, Infrastructure level security, Network Security), Access points and Access devices related Requirements. It provides detail list of delivery channels to be considered as access points.

It also provides detail guidelines for realizing each of these software systems attributes in detail. For accessibility it describes guidelines for different components – ATAG for authoring tools, WCAG for Web Content and UAAG for User Agent. It also provides broad level of WCAG 2.0 guidelines. It also describes the various security layers – Authentication, Authorization, Portal Access Control, Service Access Control, secured pages, secure proxy server, Single Sign-on, activity logging, audit trail, data security.

**Chapter 14** provides Standard Architectural requirements in tabular form for each layer

**Chapter 15** illustrates Logical Database Requirements.

**Chapter 16** portrays Digitization requirements of the project. It describes various file formats to be used for digitization of various content like - Text, Still Image (raster and vector), Video, Audio, Multimedia, GIS. It also describes delivery formats to be used for all these types of content while rendering this content on the Central Agricultural Portal.

**Chapter 17** describes rest of the important Requirements like Visibility of the Central Agricultural Portal, Web services requirement and guidelines for realizing these using NSDG, SSDG and MSDG infrastructure. It discusses these gateways in detail.

Apart from these chapters, following 5 important Annexure have been provided along with SRS of Central Agricultural Portal. These are –

**Annexure – A** listing major websites in Agricultural and allied sectors

Central Level, State Level (AGRISNET along with West Bengal Case study, Other ICT initiatives), e-District (Agricultural services covered). Detail list of ICT projects in various NARS and SASA institutes have been listed out.

**Annexure - B** provides detail context diagram of the Central Agricultural portal depicting external entities.

**Annexure - C** provides data dictionary for Common entities of the project, User Management, Grievance Redressal and Management System, Expert Advisory System, National Farmers' Database. It also gives strategy for maintaining audit trails for database related activities, in case database selected for development does not have automatic audit trail generation feature or is inadequate to satisfy the audit trail needs of the project

**Annexure - D** gives Organisation structure of Ministry of Agriculture listing out all organisations under its three departments – DAC, DADF and DARE-ICAR

**Annexure - E** provides W3C Guidelines to be followed for Accessibility for ready reference.

## 2 Central Agricultural Portal – Overall Description

### 2.1 Central Agricultural Portal – Product Perspective

The Central Agricultural Portal (CAP) would be composed of presentation, application, data access and security layers which would provide the platform to house the applications suggested for use at the Central level for e.g. Content Management, Pesticides Registration, e-Certification, etc. All the service requests with respect to these applications initiated using different delivery channels (CSC, Department, KCC, SCC, Private Kiosks, Mobile, IVRS, Agri-clinics and agri-business centers) would be processed by the Central Agricultural Portal. It will also be integrated with existing applications such as AGMARKNET, SEEDNET, etc. It will also interact with State Agricultural portals. These portals and existing applications will share data using web services.

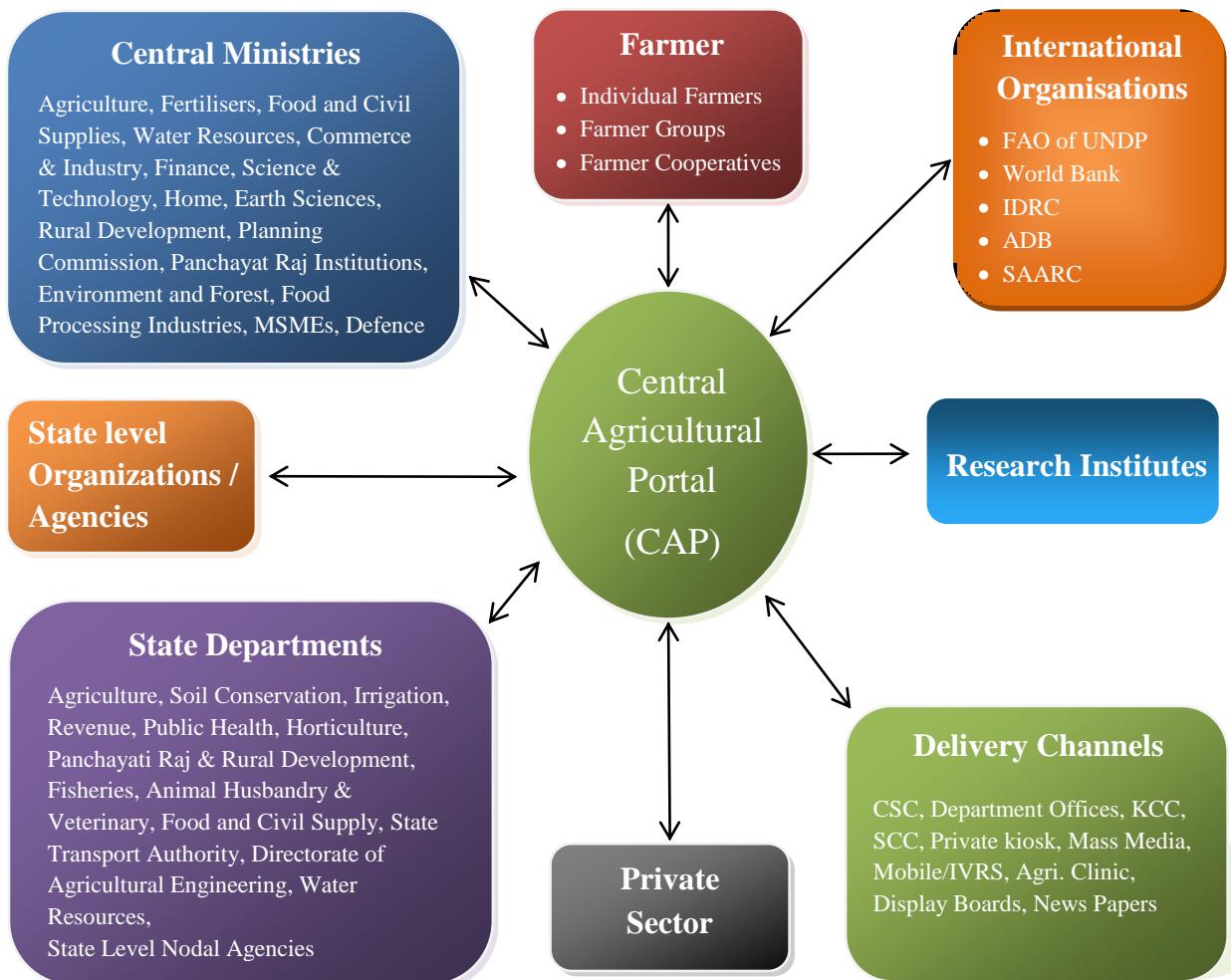


Figure - 1: Central Agricultural Portal – Context diagram

For enrichment of information on Central Agricultural Portal and providing expert advice, various ICAR Institutes are required to be involved. Also the Government departments will be responsible for timely entering transactional data into the system.

The Context diagram of the system has been shown in Figure – 1 depicting external entities like various Central Government Ministries/departments, State departments, State Level Agencies, ICAR, Research Institutes, Directorates responsible for contributing information on Central Agricultural Portal as well as the information consuming entities like Farmers, Researchers, Planners, traders etc. The detail Context diagram has been included as Annexure – B. The list of all these entities has been included in Annexure – B.

### **2.1.1 System Interfaces**

The Central Agricultural Portal will interact with other external systems, State Agricultural portals and applications developed for Service Clusters through web services. National Service Delivery Gateway (NSDG), State Service Delivery Gateway (SSDG) and Mobile Service Delivery Gateway will be used as repository of the web services and their access. Common web services available with NSDG, SSDG and MSDG will also be used for interactions among systems.

### **2.1.2 User Interfaces**

Web based Graphical User Interface (GUI) will be provided. Central Agricultural Portal will be completely menu driven and user friendly. Portal will be designed so that with minimum number of clicks user should be able to access desired information. Screens will be ergonomically designed. Wherever possible, input fields will be pre-populated.

Product function wise user interfaces such as screen formats for Input forms, output screens, report layouts, menu structures have been explained in subsequent sections.

### **2.1.3 Hardware Interfaces**

Users of the Central Agricultural Portal will be able to access Central Agricultural Portal on their client systems, smart phones.

To host the portal, hardware servers will be required for Portal server (Content Management), Application Server, Database, LDAP directory services, SMS server with adequate back up facilities and disaster recovery mechanism for 24 X 7 availability.

### **2.1.4 Software Interfaces**

User will be able to access the portal using web browser on the system having base Operating System.

On Server end, in addition to base Operating system, software will be required for internet server, Content Management, Database, LDAP directory services, application frameworks, email server, SMS server, etc.

## 2.1.5 Communications Interfaces

To access the portal internet connectivity will be needed at both server side as well as client side. Along with this, the portal will interact with the SMS Gateway server to push SMS to different stakeholders and emails servers to send the automated emails generated from the system to various stakeholders of the system

## 2.2 User Characteristic

Target user groups for the Agriculture MMP can be broadly classified under four main categories, these are:

### 1. Farmers

- a. Individual farmers
- b. Farmer groups
- c. Farmer cooperatives

### 2. Central Government

- a. Department of Agriculture & Cooperation
- b. Attached Offices & Directorates
- c. Testing Labs
- d. Academic and Research Institutions

### 3. State Government

- a. Department of Agriculture & Cooperation
- b. Attached Offices & Directorates
- c. Testing Labs
- d. Academic and Research Institutions

### 4. Private Sector

- a. Manufacturers / Wholesalers / Dealers of inputs
- b. Importers and exporters of agriculture produce

- c. Traders, Buyers and Commodity Exchanges
- d. Call Canters
- e. Agri Business Clinics and Centres

All users of the Central Agricultural Portal, such as Officers of the Central Government / State Government, Researchers, Private Sectors although are literate excluding the farmers who may or may not be literate. Yet training needs to be imparted to all users of the system for effective use, content generation and timely dissemination of information / data through the system.

## 2.3 Constraints

- Hardware Limitations
  - Dependency on connectivity, bandwidth constraints in different regions across the country for Web/Mobile based interface
  - Hardware interfaces for accessibility like speaker, touch screens, Braille interfaces
- Software limitation -Screen readers, local language fonts
- Interfaces to other applications - The portal needs to interact with different set of applications and portals
- Parallel Operation - Unexpected increase in the number of concurrent user requests during peak transaction period
- Higher-Order Language requirements: The applications under Central Agricultural Portal will be in vernacular languages and language is not constrained

## 2.4 Assumptions and Dependencies

- Data is an asset. It is valuable resource, as it has real and measurable value. Accurate and timely data is critical to quality and efficiency of service. Data input and its accuracy will depend on the user. Accountability of data will be defined.
- Content generation and updation will be done timely by the user
- Portal Management Framework will be devised and user will play active role in it
- User will provide content in local languages
- Various Government departments involved will need to collaborate and share information in order to provide improved services and work as a team for developing and sustaining the information environment

- To operate as a team, every stakeholder at Centre, State, District, Block and other entities such as ICAR Institutes, Agricultural Universities and partners will need to accept the responsibility for information management
- Commitment from information resources will be required
- User will devise mechanism and designate officers for timely resolution of grievances and queries raised under Expert Advisory
- In case of transfer, officer will be responsible for knowledge transfer and handing over the functions being carried out by him for Central Agriculture Portal to next officer. He will hand over login and password given to him to the next officer without any security breach.

## 2.5 Central Agricultural Portal – Product Functions

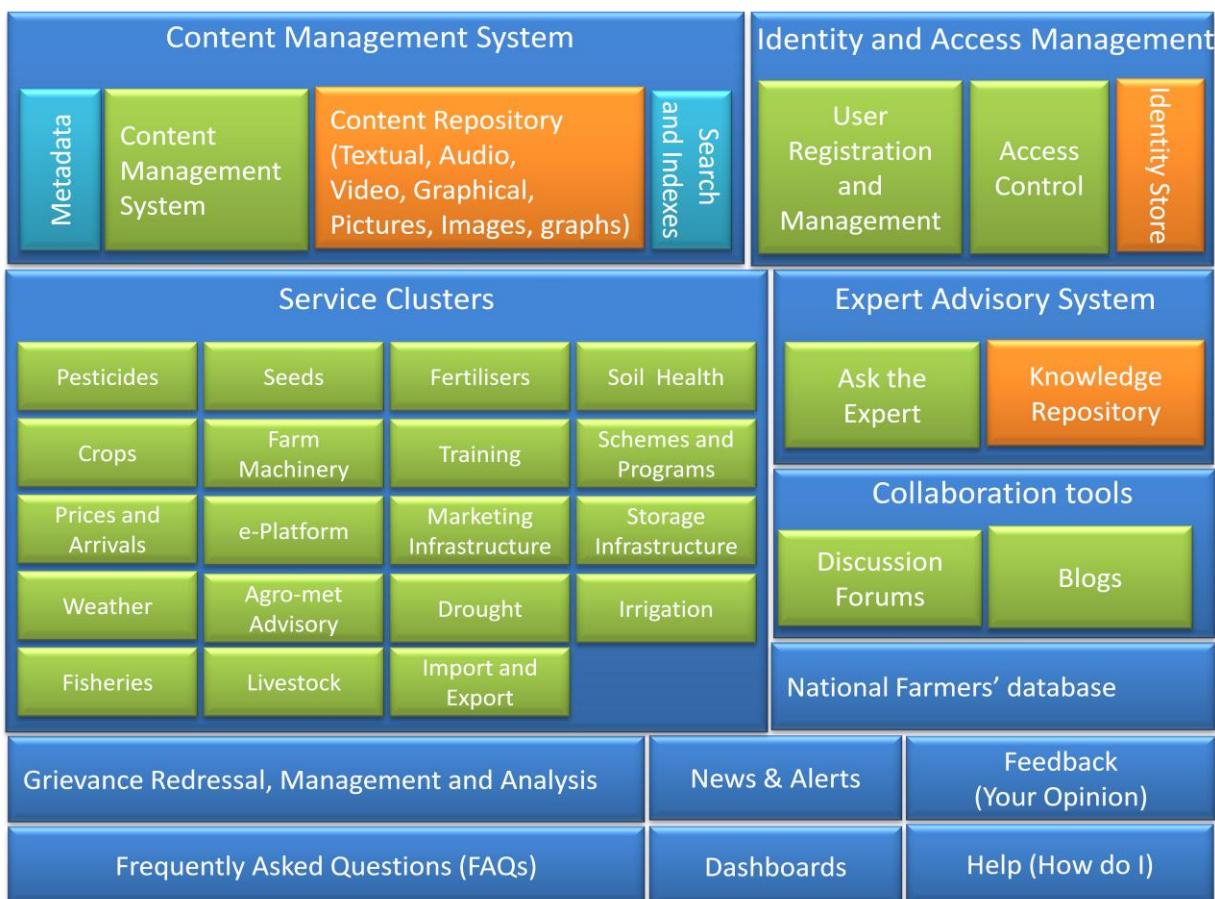
### 2.5.1 Product Functions

The major functions of the Central Agricultural Portal are as listed below-

1. Content Management System
2. Grievance Redressal, Management and Analysis
3. Expert Advisory and Knowledge Management Database
4. National Farmers' database
5. Identity and Access Management for Registered and non-registered users, Internal users, External Users, etc.
6. Links for applications and services identified under 12 service clusters –Pesticides, Fertilizers and Seeds, Soil Health, crops, farm machinery, training and Good Agricultural Practices (GAPs), forecasted weather and agro-met advisory, prices, arrivals, procurement points, and providing interaction platform, Electronic certification for exports & imports, marketing infrastructure, Monitoring implementation / Evaluation of schemes & programs, fisheries, irrigation infrastructure, Drought Relief and Management, Livestock Management.
7. Links for State Agricultural Portals
8. Feedback Mechanism and analysis
9. Collaboration Tools
10. Search and indexes
11. Directories

12. Dashboards
13. News and Alerts
14. Discussion Forum
15. Blogs – Success Stories
16. Related links – links for e-Governance projects in agricultural sector
17. Help

The component Architecture of the portal has been depicted below in Figure – 2



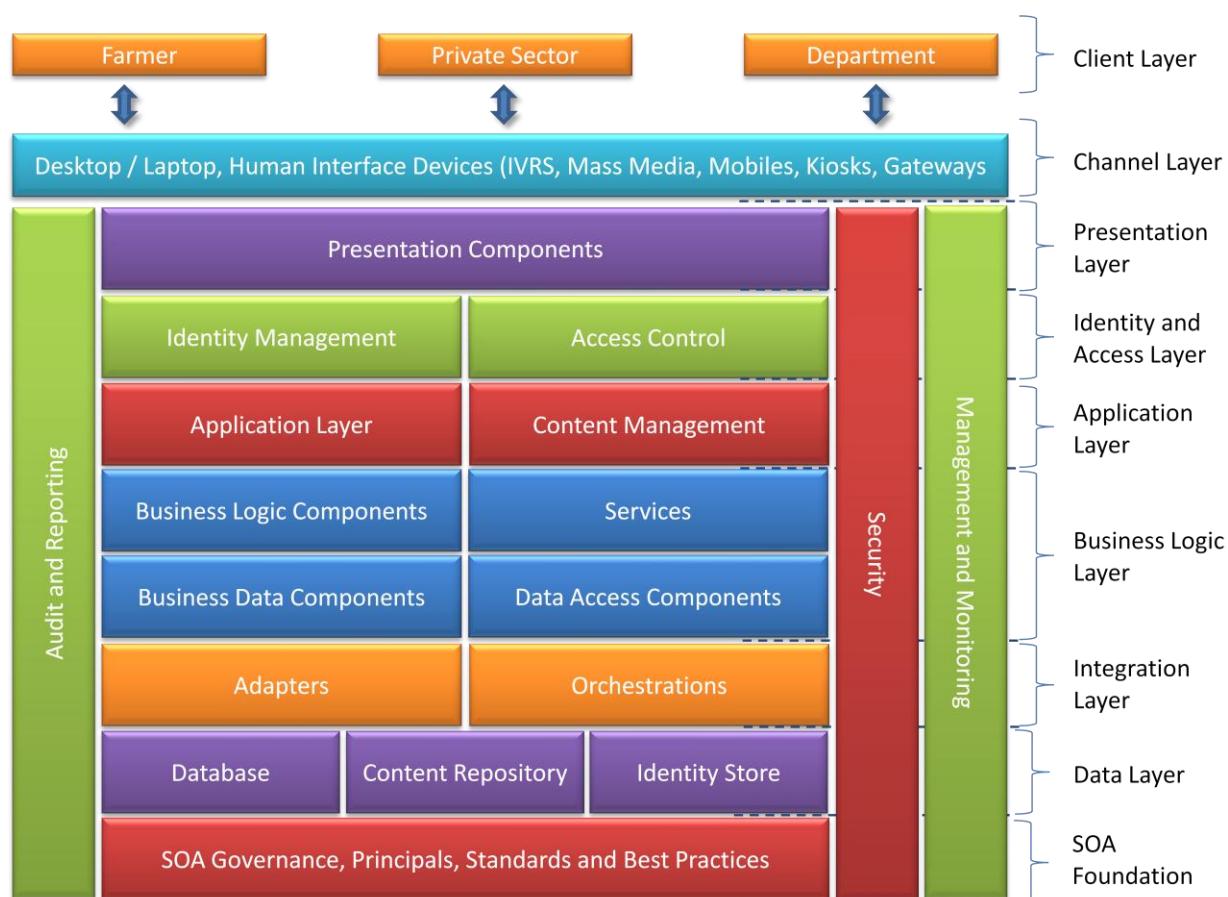
**Figure - 2: Component Architecture of the CAP**

## 2.5.2 Layered Architecture of the portal

Agriculture MMP solution is proposed to be built based on Service Oriented Architecture (SOA). SOA may be defined as a group of services that communicate with each other through either simple data-passing or two or more services coordinating some activity. SOA builds applications out of web / software services. Services comprise intrinsically un-associated units of

functionality that have no calls to each other embedded in them. Instead of services embedding calls to each other in their source code, they use defined protocols which describe how one or more services can talk to each other. To meet existing or new business requirement, services are linked and sequenced, in a process known as orchestration. Web services make these functional building blocks accessible over standard Internet protocols independent of platforms and programming languages. These services can be new applications or just wrapped around existing legacy systems to make them network-enabled. This flexibility and requirement of integrating a large number of existing and upcoming portals make this architecture the preferred choice.

Figure – 3 depicts layered architecture of the portal where each layer will be allocated defined set of functionality. Layered architecture means decomposition of services such that most interactions occur between adjacent layers. However, there is no strict rule that top layers should not directly communicate with bottom layers. Layered Architecture helps in achieving functional independence by low level coupling and high level of cohesion between functional components.



**Figure - 3: Layered Architecture of the CAP**

### 2.5.2.1 Client Layer

This layer depicts the different types of users accessing the Agriculture MMP application. Type of user typically would be an important factor in determining the level of access to applications.

- Thin Client refers to the web browser component installed on the end users machines. All services would be accessed through the browser and the proposed system would be capable of delivering the services through all the standard browsers like Internet Explorer, Mozilla, Firefox, Opera etc.
- Kiosk refers to the specially installed PC booths for disseminating agriculture related information to the farmers at village level. These kiosks would be connected to CAP through SWAN / Internet for information dissemination.
- Thick client refers to service delivery component installed on end users machine. These components would be responsible for interacting with server side components. For example, clients for uploading any knowledge base in CAP knowledge repository.

Vertical pieces like management, monitoring, security and development cut across all horizontal layers. Management and monitoring involves all aspects of SOA like services, SLAs and other QOS, life cycle processes for both applications and services surrounding SOA governance. Security is distributed across all layers.

### 2.5.2.2 Channel Layer

This consists of various devices like IVRS, Mass Media, Mobiles, Private Kiosks, etc to access Agriculture MMP application. Also, various browsers form the channel layers, through which users can access the Agriculture MMP.

### 2.5.2.3 Presentation Layer

Presentation layer will be responsible for receiving requests from the client layer, preparing response suitable to access devices and sending it. For handling dynamic content Central Agricultural Portal should use Model View Controller (MVC) design pattern, which provides loose coupling between content display format and request processing logic. Model component will be implemented as part of business logic layer. Controller and View components belong to the presentation layer. For static page requests, desired view of requested page is prepared after applying presentation rules.

### 2.5.2.4 Identity and Access Control Layer

This layer contains user management services for the Central Agricultural portal. It will include authentication and authorization services. It will allow user for single-sign-on, personalization and Self-service.

Authentication based on an active directory system allows end users to enter CAP. The parameters for this authentication would be user id and password.

Authorization is a single repository of access control for all users. This component would be responsible for defining access to various functionalities based on the access control defined in the system.

### **2.5.2.5 Application Layer**

Application layer contains application framework, Content Management Framework. Application services encompass reusable business logic. Application Framework will have application components having common functionality for e.g. Textbox, Calendar, etc. Content Management Framework will allow user for content authorization, content updation, approval, archival, etc.

### **2.5.2.6 Business Logic Layer**

This layer contains all business logic related functionality of Central Agricultural Portal. It includes service bus, service gateway, services, service registry, services repository, business data components and data access components.

This consists of service infrastructure components like service bus, service gateway for external integration, service registry, service repository and BPEL processor. Service bus will carry the service invocation payloads/messages between consumers and providers. The other important functions expected out of it are itinerary based routing, distributed caching of routing information, transformations and all qualities of service for messaging like reliability, scalability and availability etc. Service registry will hold all contracts (WSDL) of services and helps developers to locate or discover service during design time or run-time.

#### **2.5.2.6.1 Services**

Web Service provides an abstraction layer on top of an enterprise application system. The Centre and State services will be exposed through the web services for information dissemination across the States. This paradigm is also known as SOA (Service Oriented Architecture).

#### **2.5.2.6.2 Business Logic Components**

Business Logic Components include Business Applications like pesticides registration, licensing, etc. and Enterprise Applications such as payment gateway, workflow management. BPEL processor used for orchestrating the services to compose a complex business scenario or process is also business logic components. They would be responsible for processing business data. They access data using business data components and apply business rules.

### **2.5.2.6.3 Business Data Components**

Business data components encapsulate business data, typically providing Create, Read, Update and Delete (CRUD) type of functionality. They access data from data layer using data access components. They use adapters for interacting with COTS software applications or products.

### **2.5.2.6.4 Data Access Components**

Data access components are responsible for exposing the data stored in the database to business data components. Data Access Object (DAO) which manages the connection with data sources is used by these components to encapsulate access to data sources.

### **2.5.2.7 Integration Layer**

This layer consists of composite applications, portals (for interface integration) to integrate to external systems. It consists of integration components, orchestration, adapters and service communication infrastructure.

### **2.5.2.8 Data Layer**

Data Layer contains all data servers for managing structured data (RDBMS, XML DBMS, etc), unstructured data, data files, documents, images and audio-video files. Products like RDBMS, document repository, content repository, and directory server for storing identities are parts of this layer.

### **2.5.2.9 SOA Foundation**

SOA governance is important in terms of providing the overall direction to SOA implementation within the Agriculture MMP. This involves board-level involvement in addition to business and IT executives. At a high-level, this involves managing the Agriculture MMP solution implementation, managing SOA infrastructure and controlling the entire effort through all fine-tuned IT processes in accordance with TOGAF.

### **2.5.2.10 Security Layer**

This layer contains central security services. It may contain integration interfaces for third party security tools.

### **2.5.2.11 Audit and Reporting**

1. This encompasses generic services across all applications such as logging, auditing, notification, exception handling etc.
2. Session Management enables user session management at the server.
3. Audit and logging enables logging of the events / Transactions at the server. These events would then be used to generate security alerts and notifications.

4. Input validation enables validation of the raw data uploaded by the end user before saving into the database.
5. Caching Management would cache frequently used resources for faster response. For example, caching of frequently visited web pages for faster delivery at local machine is proposed.

### **2.5.2.12 Management and Monitoring**

This layer contains administration, management and monitoring related functionality for network, links to internet, hardware nodes, system software and applications. This layer cuts across all other layers. It should automate processes such as performance monitoring, network monitoring, incident management, patch deployment, data backup, disaster Management etc.

### **2.5.3 Logical view of Central Agricultural Portal**

The Central Agricultural Portal Logical Architecture as shown in Figure-4 depicts the typical functional components and interactions among them. The Central Agricultural Portal needs to interact with State Agricultural Portals and Service specific portals for 12 Cluster of Services for seamless delivery of information / services to farmers. The interactions between these portals are proposed to be done using industry's widely accepted and adopted Service Oriented Architecture (SOA) framework. The interoperability is built on XML (eXtensible Markup Language) and Web services standards. The following are the important features of Agriculture MMP solution,

- Adopt Service Oriented Architecture
- Develop business functionality as services
- Provide web based interface
- Extensible to support multiple access devices such as desktop computer, IVRS, Mass Media, Mobiles, Private Kiosks etc

Using SOA framework, the services at CAP would be exposed using the web services and same can be consumed by various State Agricultural Portals on demand basis. For example, Pesticide Registration services would be exposed through the web services and the same can be consumed by Licensing application of any State Agricultural Portal when a manufacturing license is to be issued. The manufacturer applying for a license at any of State would give his Registration number and it would be verified against the Pesticide Registration web service at CAP. Adopting this framework eradicates duplicate services at both Centre and States and ensures better manageability. Next section describes the technology architecture proposed for Agriculture MMP. All the services will be realized by the technology platform which has the following architectural building blocks

- Web Server

- Portal Server
- Application Server
- Process Server
- Enterprise Service Bus (ESB)
- Directory Server
- Identity & Access Manager
- SMTP Server

### 2.5.3.1 Client Layer Entities

Client layer entities present the information provided by Central Agricultural portal to users and handles the interaction between users and Central Agricultural Portal. Client layer entities depend on type of access devices and access points. Farmers, Private Sector and Government are the stakeholders of the Agriculture MMP solution. They will access the Agriculture MMP applications through various delivery channels. Standard web browser will be used on desktop and laptop computers, where as mobile or WAP browser will be used on mobile phones and PDAs.

Desktop, IVRS and Kiosk users will directly access Agriculture MMP solution on internet through web browsers over HTTP/HTTPS protocol. Mobile users will use mobile applications, browser and SMS technology to access the services.

### 2.5.3.2 Channel Delivery Entities

Channel delivery services contain the secured gateway services, which handles the number of transactions across the entire network. The various secured gateways that are used are XML gateway, SMS gateway, SMTP gateway, Web gateway, WAP gateway etc. Requests from Mobile users will be processed using mobile switch which in turn will forward requests to WAP gateway. WAP gateway act as bridge between the mobile world and the Internet and offers WAP services like encoding of WML pages, end-user authentication, WML script compiling and converting WAP requests to HTTP requests and HTTP responses to WAP responses. At WAP gateway WML request will be translated into HTML and it will be forwarded to Agriculture MMP web server. Once the request gets processed the response is forwarded as HTML to WAP gateway which will convert HTML into required WML format and display it on mobile devices.

### 2.5.3.3 Presentation Layer Entities

Presentation layer contain user interface components such as JSP, Servelets, JSP tags, HTML forms, CSS etc. These components typically contain code to perform functions such as configuring the visual appearance of content, accepting and validating user input, and acquiring and rendering data from business components. Presentation Services handle the user management, personalization features. Based on the type of user logged in, the layer routes the request to the respective services of the

business service layer of Agriculture MMP solution. Every functional module would have some presentation components catering to user interface of the functional module.

External applications will interact with Central Agricultural portal for information exchange. To facilitate this information exchange presentation layer will include entities like web services, adapters and connectors.

#### **2.5.3.3.1 Web Portal**

The Web Portal provides information for the stake holders over internet using a web browser. There will be certain sections of the portal which will be accessible to all the users which is referred to as the “public” part of the portal and certain sections which can be accessed only by authorized users referred to as the “protected” part of the portal. Based on the role of the user being authenticated respective functionality will be made available to the users. Responses will be rendered using Cascading Style Sheets (CSS). JavaScript will be used for client side validations. Agriculture MMP solution would support multi-lingual content and pages will be displayed in the language selected by user.

#### **2.5.3.3.2 Personalization**

Personalization component of Central Agricultural Portal provides its stake holders to customize their preferences for better user experience. Personalization covers the ability for a user to influence their experiences. Increasingly, portals themselves offer users the ability to tailor the function available to best suit their needs. That part of personalization that is relevant for presentation is of direct concern to authors when creating web content that support multiple delivery contexts.

#### **2.5.3.3.3 User Management**

The user management function should address how identities and users are created, maintained, or revoked on termination.

##### **2.5.3.3.3.1 Self-Service**

Self-Service component will provide interface to let citizens to manage the activities like user registration, reset passwords, update profile, subscribe for services etc. on their own. For security purpose, user registration process on Central Agricultural Portal must provide CAPTCHA (Completely Automated Public Turing Test to tell Computers and Human Apart).

#### **2.5.3.3.4 Role Management**

The Role management function should address how roles are defined and users are assigned these roles.

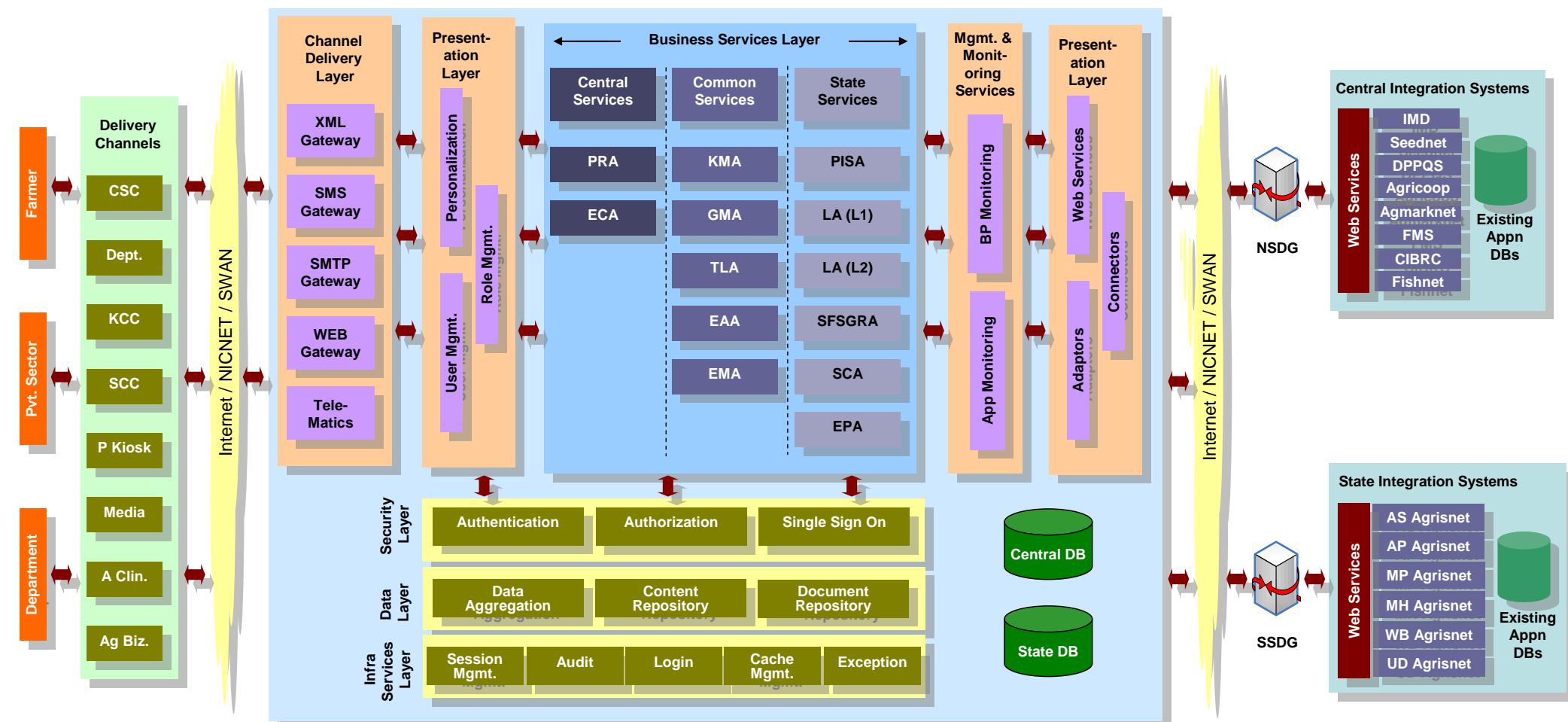


Figure - 4: Logical view

### **2.5.3.4 Business Service Layer Entities**

The Business services will provide required services for its stake holders. These services will be provided by Central, State and various applications and consumed by Central, State Portals using service communication components. The Business Service Layer entities will include Content Management Services, Transactional Services and Workflow Services, Reporting Services, Search Services, Notifications, etc.

Business logic layer modules will be implemented using web services, business logic components, business data components and data access components.

#### **2.5.3.4.1 Content Management Services**

Central Agricultural Portal will have large number of content objects and documents. It should manage complete life cycle of all content objects. Hence it should use Content Management System. Content generators create information and it is stored and managed in electronic or manual record form. This functional module provides content management related functionality. This module should be realized by customizing Commercial Of The Shelf (COTS) Web Content Management System.

##### **2.5.3.4.1.1 Content Authoring**

Content authoring component is for building web content that can be accessed by citizens via a wide variety of different devices with different capabilities.

##### **2.5.3.4.1.2 Content Metadata Capture**

Whenever there is generation of new content, all metadata related to it will be captured. Whenever there is updation of content, metadata will be updated accordingly.

##### **2.5.3.4.1.3 Content Workflow**

Content workflow includes content creation, review, submission, metadata creation, content archival.

##### **2.5.3.4.1.4 Content Delivery**

Content management systems include content aggregation/deployment tools, which make use of content objects from content management system's content repository for delivery of relevant content to Central Agricultural Portal users.

##### **2.5.3.4.1.5 Content Feeds**

Content feeds are a type of electronically sourced content over internet using standard protocols and content formats such as RSS (Really Simple Syndication). RSS is a XML file format, used for distributing news headlines on the web. It is used for frequently modified content such as

news, blogs, etc. Following guidelines should be followed for receiving or consuming content feeds:

- a. Design and develop a “feed reader” component to receive content feeds
- b. Use job schedules to download content feeds at defined time intervals and save into content repository as content object.
- c. Always display original source, while displaying content received by means of feeds.
- d. Content feeds must be received only from pre-approved sources.

#### **2.5.3.4.1.6 Metadata Synchronization**

Metadata Synchronization would be used for replicating metadata from Central Agricultural Portal and State Agricultural Portals to “Centralized Metadata repository” using metadata Centralized server.

#### **2.5.3.5 Workflow Services**

Workflow services capture input data, process as per standard procedures and business rules for it for a pre-defined output. Workflow service addresses the application submission, status tracking, verification of documents, payment and availability of service. All the workflow services should be available online with the availability of 24X7 and 99.9% uptime. Some of the Workflow services that will be available on Central Agricultural Portal have been as listed below-

- Pesticide registration
- Registration of seed growers
- Seed Certification
- Soil Testing Lab - soil health card
- Testing Lab - Pesticide, Fertilizer
- Pest Roving Survey including pest infestation status
- Fish Seed Grower Registration
- Electronic Certificate for import & export
- Monitoring of Schemes
- Expert advisory
- Grievance Management

#### **2.5.3.6 Transactional Services**

Transactional services will be provided by various departmental applications. In transactional services data will be captured, processed and presented to the user in the desired format. Each transactional Service will have data capturing module, data processing module and application specific reporting module. For e.g. Market prices and arrival data, Seed availability, etc.

### 2.5.3.7 Search

Agriculture MMP solution will have search component to provide quick access to information, which includes documents, HTML pages, images, audio files, video files etc. Some of the features Search should address have been listed as following -

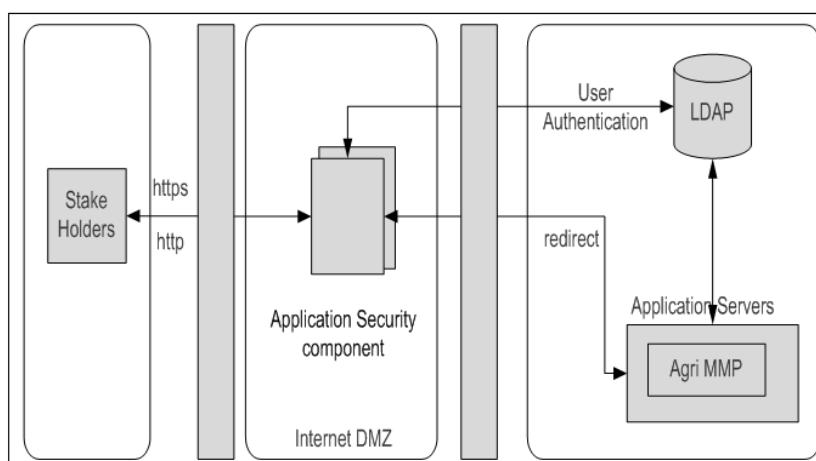
- Search personalized information on crop diseases, agro-meteorological advisory
- Search localized information on forecasted weather
- Search information on registered, banned, restricted for use and refused registration process
- Search information on pesticide testing labs, fertilizer testing labs
- Search information on regional suppliers, market infrastructure, storage infrastructure
- Search localized information on prices, physical progress, irrigation infrastructure
- Searchable information on GAPs, PoPs

### 2.5.3.8 Notifications

Agriculture MMP solution would have facility to send notifications to its registered users. Users should be able to subscribe for some of the services like News Letters, Journals etc. On updates in these services, subscribed users of Agriculture MMP solution will get notifications by email.

### 2.5.3.9 Security Layer Entities

The secure proxy server will intercept stakeholders request to access the secured information. URL will be routed to this component, whereas it will challenge (User Id and Password) the user for authentication if user accesses the secured information.



**Figure - 5: Central Agricultural Portal – Security Layer**

### **2.5.3.9.1 Authentication**

Agriculture MMP solution's authentication component will authenticate by challenging user to provide user Id and password.

### **2.5.3.9.2 Authorization**

Authorization component will make sure that stake holders must be able to access whatever information they have got access to. An authorized system user should be allowed to define the various available roles in the system. Each user should be mapped to the respective role. Based on this the user should be provided access to various available functionalities of Central Agricultural Portal.

## **2.5.3.10 Data Layer Entities**

### **2.5.3.10.1 Database Server**

Central Portal Server will use Relational Database Management System (RDBMS) for storing structured data.

### **2.5.3.10.2 Document Server**

Central Portal Server will use document repository to store static content such as documents, PDF files, images, audio / video files etc.

### **2.5.3.10.3 Content Repository**

Content repository is an integral part of content management system. It is a database in which electronic documents and other web content are stored. A content repository may also contain pointers to files stored on a file server. However it is not necessary that content is stored in some database. Web content, stored in a common or single repository, can easily be accessed as and when necessary, reused in a variety of ways. It can facilitate creation, modification and approval of content from any location by authorized users. It can facilitate scheduled publication of content to a web-site in a controlled manner using a defined process.

### **2.5.3.10.4 Directory Server**

Directory server is used for storing infrequently modified but frequently queried data such as application settings, user profiles, group data, policies, access control information, etc. It is specialized database that is optimized for lookups. It should conform to LDAP standards. Directory Server of Central Agricultural Portal will contain profile information of stake holders, Roles, application level ACLs (access control lists), service level access control list etc. This directory server should be made accessible using LDAP.

### 2.5.3.10.5 Portal Usage Data

Central Portal will capture the user experience information like how many hops a user is required to perform to reach desired piece of information, usage of service, time spent, hits/visits, etc. Based on these inputs, business process optimization can be done to provide better user experience.

### 2.5.3.11 Infrastructure Services Layer

Agriculture MMP solution would contain following list of Utility services to maintain and manage the portal application.

- Application level logging
- Validations
- Exception handling
- Notifications
- Application level caching
- Localization
- Application configuration
- Master data management
- Session management
- Auditing and reporting

#### 2.5.3.11.1 Auditing and Reporting

Agriculture MMP solution's reporting component will be used to generate reports for following requirements but not limited to

- Generate web analysis report
- Provide audit trail, i.e. author, date created, modifier, date modified, for each program.
- Generate report for general application statistics, e.g. availability and average response time etc.

### 2.5.3.12 Integration Layer Entities

#### 2.5.3.12.1 Service Communication Infrastructure

To provide access to services of Central Agricultural Portal service communication infrastructure component is proposed, which encapsulates

- Provide container environment for services
- Service interface
- Protocol translation

- Message routing
- Data transformation

This component will be used by Central Agricultural Portal to access services provided by various government departments. It may be NSDG/SSDG compliant or web services compliant or both. In some cases it may happen that some of the services would be developed and deployed as NSDG services where as few other services would be developed and deployed as web-services.

### **2.5.3.12.2 Integration Components**

Central Agricultural Portal will be integrated with external application using the following means,

- Adaptors
- Web Services
- Connectors

### **2.5.3.12.3 Operations Layer Entities**

#### **2.5.3.12.3.1 Service Registry and Repository**

The service registry will provide a way for a consumer to find a Central Agricultural Portal service. This will involve publishing a service's description (in WSDL format) in a registry. Consumer browses through a registry and obtains service's description.

Although much of the required information is already part of the service contract, the service repository will provide additional information, such as physical location, information about the provider, contact persons, usage fees, technical constraints, security issues, and available service levels.

#### **2.5.3.12.3.2 State Department Applications**

Service Cluster Applications will provide required business services to state citizens channeling through Central Agricultural Portal using services.

#### **2.5.3.12.3.3 Other External Applications**

Central Agricultural Portal will integrate with other external applications using services.

#### **2.5.3.12.3.4 State agricultural Portals**

State Agricultural Portals will integrate with Central Agricultural Portal to provide state services to citizens if users want to access required information using Central Agricultural Portal.

### **2.5.3.12.3.5 Content Feed Provider**

Content feed providers provide content to Central Agricultural Portal. Following guidelines should be followed for content feeds

- a. All feeds must be received only in electronic form
- b. RSS standard should be used for live feeds
- c. Wherever possible feeds should be received online

## **2.5.3.13 Management and Monitoring Layer Entities**

### **2.5.3.13.1 Network Monitoring and Management**

Network Monitoring and Management provides the ability to monitor and control network devices. Monitoring includes the collection and storage of key device parameters. Controlling includes the ability to affect the configuration of the device. The data that is collected will support the analysis of network traffic (availability, utilization, capacity, errors and throughput) and the generation of associated network performance profiles.

### **2.5.3.13.2 Host / Node Monitoring and Management**

Host monitoring and Management provides the capability to monitor, display, detect, set and report information about computer hosts and peripheral devices. Host parameters include accessibility, CPU usage, memory usage, swap usage and disk usage etc. Device Management provides the capability to monitor and control other SNMP and non-SNMP devices.

### **2.5.3.13.3 Application Monitoring and Management**

Application Monitoring and Management provides the capability to monitor and control software application processes on monitored computer hosts. In addition, to the collection and display of application parameters (performance, space, resource conditions, availability), application management allows for the initiation and termination of application software directly from the management console. User friendly web based interface should be provided for Central Agricultural Portal's administration related functionality.

### **2.5.3.13.4 Security Management**

Security Management provides the capability to manage user and network security across a distributed environment. User security includes the management of available authorization and authentication controls. Network security includes the ability to protect the managed environment from specific external accesses, intruder detection, virus protection, etc.

### **2.5.3.13.5 Data Backup and Restore**

The data backup is performed as part of schedule task and is encrypted to ensure safeguard against data theft. Automated backup & restore components of Central Agricultural Portal will take backup of required content like application code/executables, data, content etc and restore whenever required (e.g. in the event of a disaster).

### **2.5.3.13.6 Disaster Management**

Central Agricultural Portal should support business continuity. Therefore data should be replicated to DR site as per policy defined so that DR site can take over within defined time lines.

### **2.5.3.13.7 Host Administration**

Production environment of Central Agricultural Portal will include multiple servers. It is desirable that all servers should be administered from a single system using unified interface.

### **2.5.3.13.8 Application Administration**

User friendly web based interface should be provided for State Portal's administration related functionality.

### **2.5.3.13.9 System Administration**

Central Agricultural Portal will have system administration tool for application maintenance, providing following functionality:

- Applying operating system updates, patches, and configuration changes etc.
- Incorporate changes in the services without triggering changes in core processes and the Centre / State / District Agriculture Department and Attached offices
- Enable administration to monitor all aspects of the service delivery and meet the reporting requirement at all levels of the department pertaining to the selected service
- Administrators can remove contents using this functionality of the application.

## **2.5.4 Integration view of Central Agricultural Portal**

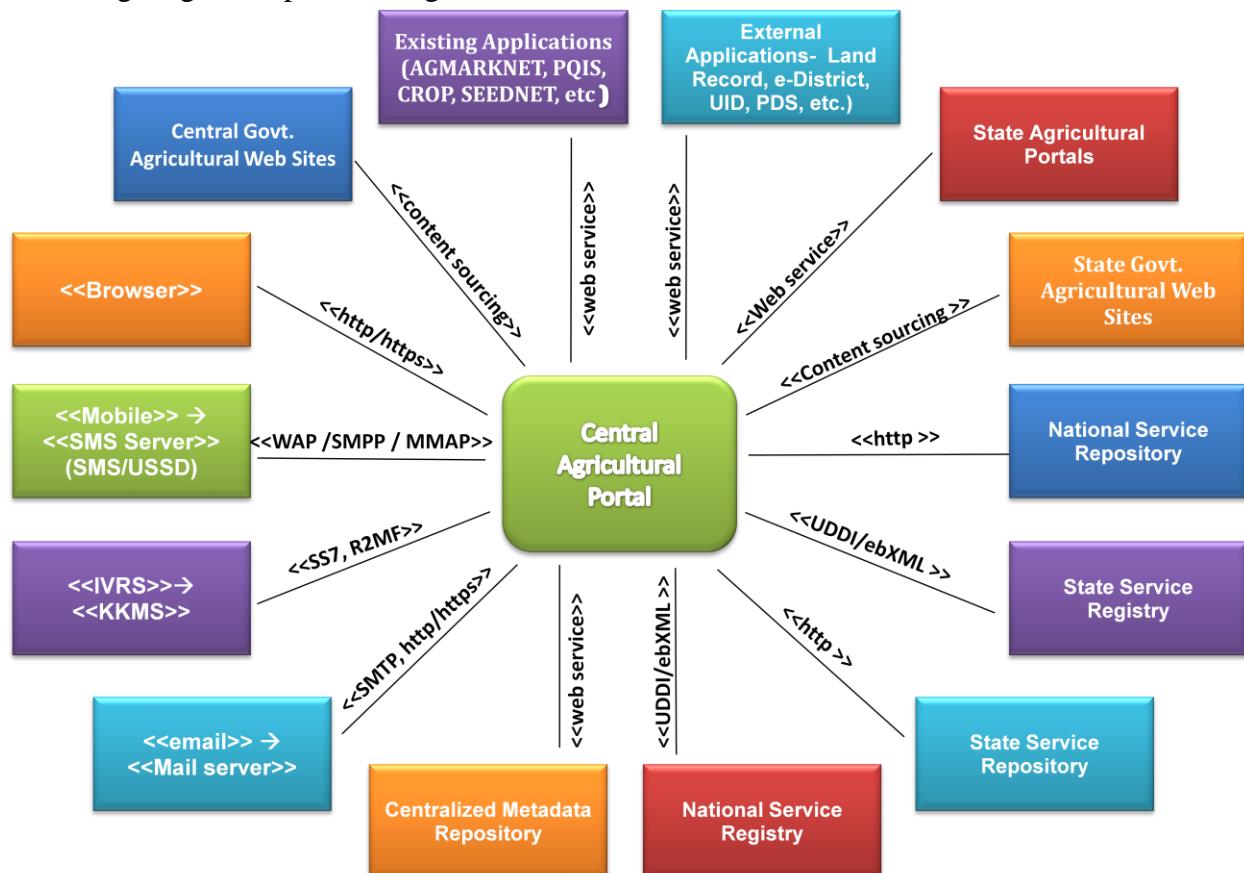
Central Agricultural Portal developed under NeGP-Agriculture Mission Mode Project will need to interact with

- a. Existing websites and web applications of DAC like AGAMRKNET, DACNET, SeedNet, PQIS, CROP (Computerized Registration of Pesticides), etc.)

- b. Websites and Applications developed by State Governments in Agricultural sector under various projects like AGRISNET;
- c. State Agricultural Portals
- d. Applications developed under various other projects like e-District, Land records, UID, etc.
- e. National level service registry/repository
- f. State level service registry/repository
- g. Centralized Metadata Repository

These applications/repositories use different platforms and technologies. Integration Architecture specifies how various applications operating on different platforms can effectively work together. Integration techniques should be used when new application systems need to access existing application systems, while maximizing the investment in existing systems and platforms. Central Agricultural Portal will integrate with following external interfaces to provide services to citizens

Following diagram depicts the high level overview of external interfaces -



**Figure - 6: Central Agricultural Portal – Integration View**

### **2.5.4.1 Content Integration**

One of the major objectives of Central Agricultural Portal would be to integrate content from government department and organization's websites and provide interoperability with State Agricultural Portals by means of keeping Centralized metadata repository updated with metadata of State Agricultural Portal's content. "Content Integration" section explains -

- a. Approach for consolidating metadata from Central Agricultural Portal and all State Agricultural Portals and
- b. Approach for metadata based search within Central Agricultural Portal and all State Agricultural Portals, using "Centralized Metadata Repository"

Central Agricultural Portal would have thousands to millions of web pages and documents. These documents would be related to government agricultural matters and contain wealth of information required by farmers, agri-businesses and Government. There will be hundreds of portals from government Agricultural departments, organizations, universities, etc. In a scenario where every portal or website is governed in its own way, stakeholders will find it extremely difficult to access or discover the information they are looking for. In order to provide an easy access to information an integrated approach towards making content easily discoverable, minimizing semantic inconsistencies and avoiding content duplication is a must. Integrated approach will enable easy access to information and make all content published on Central Agricultural Portal and State Agricultural Portals, easily discoverable.

#### **2.5.4.1.1 Content Integration Approach**

Content integration will require number of processes during the entire life cycle of content. This section describes the State Portal's approach for content integration.

##### **a. Standardize Content Taxonomy**

Content taxonomy should be standardized. Central Agricultural Portal would comply with defined standard. Compliance and governance processes should check adherence to defined standards. Content publishing workflow should enforce taxonomy rules as part of publishing process.

##### **b. Standardize Metadata Schema**

Metadata schema should be standardized. Central Agricultural Portal would comply with defined standard. Compliance and governance processes should check adherence to defined standards. Content publishing workflow should enforce definition of all metadata attributes as part of publishing process.

**c. Standardize Master Data**

Master data should be standardized. Central Agricultural Portal would comply with defined standard. Compliance and governance processes should check adherence to defined standards. Content publishing workflow should enforce usages right master data values as part of publishing process.

**d. Standardize Content Publishing Workflow**

Content publishing workflow should be standardized web enabled automated process. Definition of metadata should be integrated into publishing workflow. **Standardize Content Management System.**

Content management system should provide defined set of standard functionality.

**e. Unique Content Identifier**

All content should be assigned a unique ID. Content repository should have web based access. All published content should be accessible using a URI.

**f. Centralized Metadata Repository**

A Centralized Metadata Repository should be established, which will store metadata of all content published on Central Agricultural Portal using an automated process.

Centralized Metadata Repository will store metadata in normalized form. Normalization will enable high quality search results and provide semantic integration of content from Central Agricultural Portal and State Agricultural Portals.

**g. Metadata Updates**

When new content gets published, its metadata should be propagated to Centralized Metadata Repository. Similarly metadata may get changed after publishing of content. In such case also changes should be propagated to Centralized Metadata Repository. Propagation of metadata should be managed using an automated process.

### **2.5.4.2 Integration of transactional services**

Transactional services are one of the major components (Content, Transactional, Workflow, GIS, Data warehousing, etc.) of NeGP-Agriculture Mission Mode Project. Transactional services will be provided by the Government at Central, State and District level. Some of these services have already been developed and to be integrated with NeGP Agriculture Mission Mode project. Various Government departments are the owners of these processes. Level of automation of these processes vary from Central to State level and State to State Level and also departments within a State. Further departments which have adopted computerization and automated their processes will be using different set of architecture styles, tools and technologies. Under this

scenario Central Agricultural Portal need to use different combination of integration approaches for accessing departmental applications and processes.

The Central Agricultural Portal would use service oriented architecture to integrate various transactional applications. Transactional applications would expose their functionality as service. Services would interface with transactional applications, providing access to department's services and processes. Usage of open standards and service oriented architecture will help in realizing the principles of interoperability, reusability, extensibility, loose coupling, technology independence, vendor independence etc.

Services would be developed using web services technology or SSDG technology.

#### **2.5.4.2.1 Web Service Compliant Services**

Web services is a standardized way of integrating Web-based applications using the XML, SOAP, WSDL and UDDI open standards over an Internet protocol backbone. XML is used to tag the data, SOAP is used to transfer the data, WSDL is used for describing the services available and UDDI is used for listing what services are available. Used primarily as a means for businesses to communicate with each other and with clients, Web services allow organizations to communicate data without intimate knowledge of each other's IT systems behind the firewall. Web Services are published, found, and used through the Web. Web services do not provide the user with a GUI. Web services instead share business logic, data and processes through a programmatic interface across a network. Developers can then add the Web service to a GUI (such as a Web page or an executable program) to offer specific functionality to users.

Web services allow different applications from different sources to communicate with each other without time-consuming custom coding, and because all communication is in XML, Web services are not tied to any one operating system or programming language. Web services do not require the use of browsers or HTML.

The basic Web services platform is XML + HTTP. BPEL can be used for orchestrating services to describe the business process.

Web based services would be deployed on a web service compliant "common service communication infrastructure" using a federated deployment model, where a service cluster may exist at different levels such as national, state, department, district, block etc.

#### **2.5.4.2.2 NSDG Compliant Services**

Service may be developed based on NSDG technology. NSDG based services would be deployed on NSDG compliant "common service communication infrastructure".

### **2.5.4.2.3 Integration with Departmental Applications**

NSDG Specifications: <http://www.nsdg.gov.in/administration/technicaldetails.isp>

#### **2.5.4.2.3.1 General Interface for Transaction Government Services**

Central Agricultural Portal would work as a single source of information for all government content in Agricultural Sector and provide front end or start point for all the government services provided by Central Government Departments in Agricultural Sector. It is required that functionality of departmental applications and services provided by the departments are made accessible on Central Agricultural Portal as services using web services technologies. Web service based implementation of transactional government services will make them reusable, easy to integrate, interoperable and easily accessible. Any government website, portal or application would be able to easily consume these transactional government services using standard protocols.

#### **2.5.4.2.3.2 Service Invocation Component**

Service invocation component would be a technology entity capable of displaying dynamically created content such as JSP, ASP.Net, Servelets, and PHP etc.

#### **2.5.4.2.3.3 Service User Interface**

This represents the web based interface for transactional government services. This would be implemented using technologies like JSP, Servelets, PHP, ASP etc. Its exactly functionality would vary from service to service. It should conform to defined user interface guidelines.

#### **2.5.4.2.3.4 Service Proxy**

Service proxy represents transactional government service on service consumer side (such as Central Agricultural Portal) encapsulating all technology related details of service such as getting service URL, handling exceptions etc.

#### **2.5.4.2.3.5 Departmental Applications**

This represents any departmental application of Central government departments.

#### **2.5.4.2.3.6 State Service Registry and Repository**

This represents state level directory of transactional government services. This should support open standards UDDI and ebXML. Service repository should provide web based interface.

#### **2.5.4.2.3.7 National Service Registry and Repository**

This represents national level directory of transactional government services. Content from state level service registries and repositories will be replicated into National service registry and repository. Service registry should support open standards UDDI, ebXML. Service repository should provide web based interface.

#### **2.5.4.2.3.8 Transactional Government Service (TG Service)**

Transactional government services should be implemented as web service. It will expose functionality of departmental applications to other applications and portals.

### **2.5.5 Data view of Central Agricultural Portal**

Efficient Data Management is crucial for timely provision of information services. Correctness and timely availability of data are important factors of any e-Governance project. Data and information are extremely valuable assets of the Central Agricultural Portal also. Data view establishes an infrastructure for providing access to high quality, consistent data wherever and whenever it is needed. This infrastructure is a prerequisite for fulfilling the requirement for data to be easily accessible and understandable by authorized end users. Following are the suggested best practices that should be followed while managing data.

<b>Sl. No.</b>	<b>Guideline</b>	<b>Description</b>
<b>Data Modeling</b>		
1	Design a flexible data model	Design data models such that any future changes in business requirements can be accommodated.
2	Minimize manual entry of data	<ul style="list-style-type: none"> <li>a. Use look-up tables where ever appropriate</li> <li>b. In the design phase, consider the values that may be input into a field.</li> <li>c. Wherever possible pre-populate the fields to bring consistency and minimize data entry errors</li> </ul>
3	Use normalize and de-normalize patterns accordingly for performance	<ul style="list-style-type: none"> <li>a. The third normal form is the most commonly recommended form for the ER model.</li> <li>b. To increase the performance, a de-normalized database can be used as there can be fewer joins, or reduced access to multiple tables.</li> </ul>
4	Setup indexes and relationships	<ul style="list-style-type: none"> <li>a. Limit the number of indexes on databases that will be experiencing significant insert and update activity. When an insert is performed, not only is the record updated, but all the indexes are updated as well.</li> <li>b. Increase the number of indexes on databases where importance lies in retrieval time.</li> <li>c. Indexes can increase performance on retrieval time.</li> <li>d. Before creating a database, indexes, or data access programs, verify that all relationships have been documented.</li> </ul>

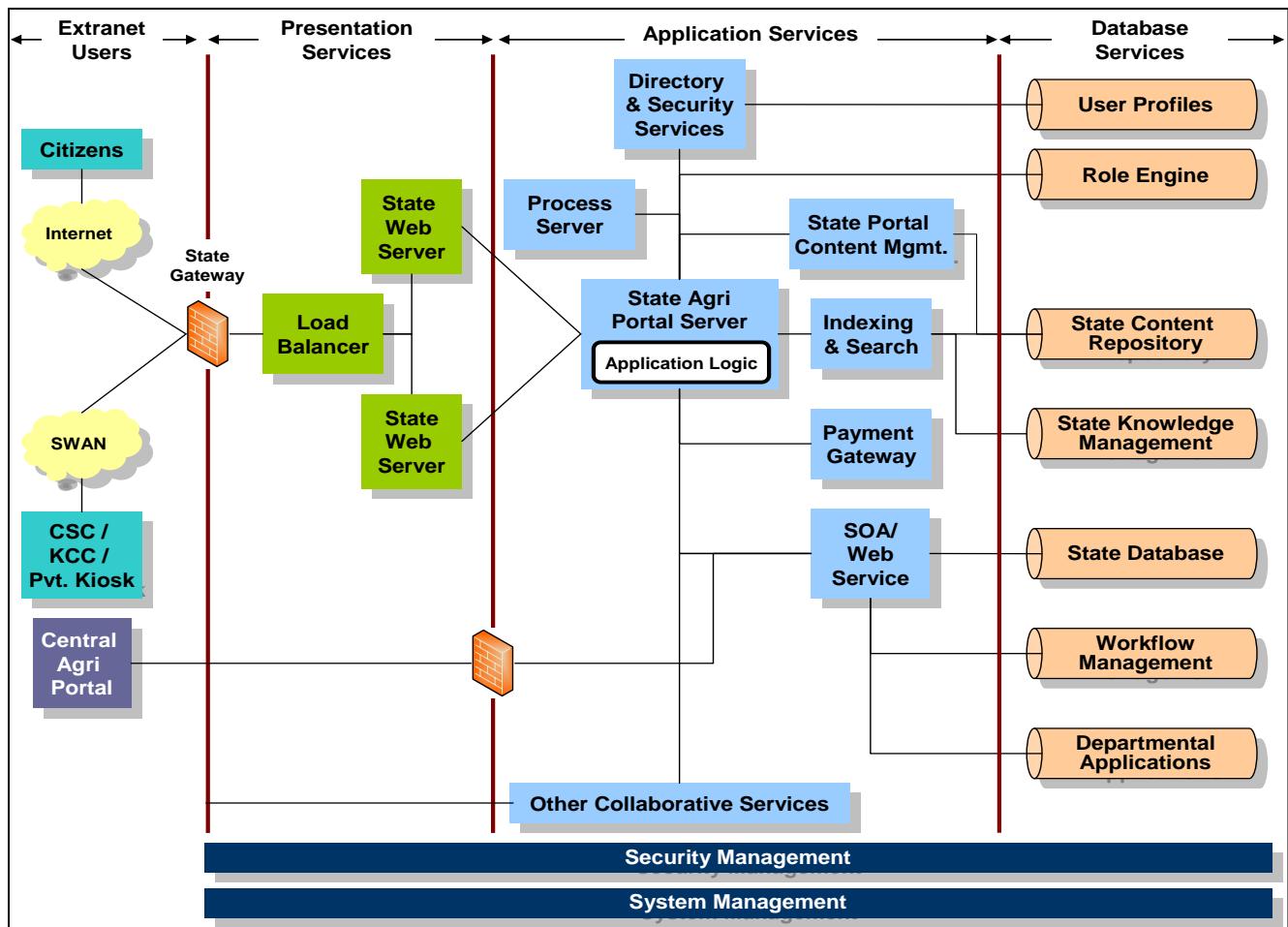
5	Archive and protect the data model	Data models along with data must be archived and stored in a secured position to minimize the loss of data
<b>Metadata management</b>		
6	Keep Centralized metadata repository up-to-date	The repository must be actively maintained (e.g., changes to metadata occur in the repository whenever new content is published at portals)
7	Communicate and share metadata definition	Information about standard metadata model should be easily available and communicated to all concerned.
8	Define review process for metadata	Design reviews are essential to ensure that shared content data is defined consistently across all portals. Design reviews also determine whether data that already exists is consistently defined and not redundantly stored
9	Define metadata standard taking into consideration in use models	Review the existing standard and proposed data elements in the Centralized metadata repository before implementing a new database to ensure data elements are defined according to standards.
10	Govern metadata	Follow a well defined process to govern all changes to metadata
<b>Data Accessibility</b>		
11	Use industry standard database connectivity	Use industry standard tools like JDBC, ODBC, Hibernate etc to access database instead of vendor specific accessing tools. These standards are highly adaptive for changes in database without much effort and cost.
12	Avoid usage of vendor specific extensions	Database vendors have its own proprietary extensions to perform certain functionality on databases. Use ANSI-SQL standards rather than using these extensions otherwise there would be vendor lock-in.

## 2.5.6 Application Architecture

The various components of the portal architecture are shown in the next figure. The state portal would expose its service interfaces through web services using XML/SOAP protocol. These exposed interfaces would be transmitted to Centre / various States through dedicated WAN connectivity over http/https commutation channel. The data transmission is to be taken care of at Enterprise Services Bus (ESB) layer.

The Centre Agriculture Portal would provide services to both internet and intranet based users. The centre portal would facilitate the single sign-on access to all its registered users using authentication and authorization services at the state level. Once the user logs into the system, they would be able to consume all the services they are authorized to. The portal would essentially provide many knowledgebase informational contents to all its users and needless to

say that access to these contents would be unrestricted. The farmers would have the option to post their suggestions/complaints on grievance management systems.



**Figure - 7: Central Agricultural Portal – Application Architecture**

Caching and load balancing mechanism is to be adopted at web server layer to improve performance irrespective of number of end users and volume of data. As a part of performance initiative, it is recommended that data archival and purging is performed at a regular interval of time. Though these components are essentially same as their counter parts at state level architecture, the communication between state and centre portal is handled by integration of ESB component with state component through dedicated connectivity. The guidelines for enabling of data transfer between states and centre are as follows.

- Synchronous incoming requests from centre to be handled using message queue paradigm.
- Data should be exchanged using XML/SOAP standard and the services/functionality would be exposed by wrapping around a web service interface.
- Asynchronous incoming requests can be handled using message driven mechanism.

### **3 Central Agricultural portal – Specific Requirements**

**Figure - 8: Central Agricultural Portal - Home page**

The Central Agricultural Portal will provide single window service for all Agricultural related information and services. The home page of Central Agricultural portals have been depicted in Figure 8. The details of the links have been provided here in subsequent sections.

## 3.1 Home Page Links

### 3.1.1 GoI Logo

The Home Page of the portal will have the National Emblem on the Top Left corner to indicate that this portal belongs to Government of India.

### 3.1.2 Language Bar

The top bar of the portal is language bar. Using Language bar, user will be able to display the home page, content and other pages in the language of his choice. The default language of the Home Page will be English but the User can select from a choice of languages like Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil and Telugu. The language title will be displayed in that particular language. Tool tip will be provided in English. For example Hindi will be displayed as “हिंदी” and so on.

### 3.1.3 Portal Help Bar

The second bar of the portal is Site Help Bar. It will guide user for usage of the portal. It will inform user about accessibility options, provide site navigation map. User will be able to add portal to his favorite's site list to help user to access the portal without remembering the complete URL and typing it each time. The Portal can also be referred to another person by the user with the help of Tell a Friend link. User can subscribe to RSS feeds made available on the portal.

Apart from this, user will be allowed to select theme of his choice (black, blue, green and orange), choose font size as bigger, normal or smaller and toggle the text to speech option to read the content on mouse hovering.

### 3.1.4 Portal Title Bar

This bar displays logo and name of the project as well as name of the Department and Ministry as Department of Agriculture & Cooperation, Ministry of Agriculture its being owner of the project.

### **3.1.5 User Registration and Login Bar**

Some of the services of the portal are only for the registered users. User has to register on portal to access these services. User can register on portal using “New? Register Here” link. Once this link is clicked, user will be displayed the User Registration form. Details for User Registration have been covered in subsequent sections.

### 3.1.6 Sign In

After registration, user will be allowed to login on the portal clicking “Sign In” link provided on the right side of the fourth bar of the home page.

The login page will be displayed as shown Figure-9. User has to provide User Id, Password and enter verification code for site security and click on “Log In” button provided at the bottom of the window. After successfully login, he can access the user specific services for which he has privileges like upload the content for success stories, participate in discussion forums, blogs, use customization option, ask queries to experts, post grievances etc.



**Figure - 9: Log In Window**

**Figure - 10: Home page after logged-in**

### **3.1.7 Customize**

This is displayed on left side of the fourth bar on the home page. It will allow user to change look and feel of the portal as per individual choice of the user. Customization will allow user to turn off the windows which are not relevant for him. Using this option user will be allowed to choose crops and services of his choice to be displayed on the portal home page.

### **3.1.8 My Agri**

Using “My Agri” link, user will be able to manage his account for Central Agricultural Portal. Using this link, he will be able to change his password, change his profile.

### **3.1.9 Crops Bar**

This bar displays list of various crops. User can click on crop name of his choice. All information related to that crop will be displayed to user. For e.g. Agro-climatic conditions necessary for crop to grow, seed varieties and availability, season for sowing, harvesting, suitable weather conditions, soil type requirements, water requirements, pest and diseases, fertilizers requirements, pesticides requirement, post harvest infrastructure needed and availability, storage requirements and availability, processing options, Markets and demands, prevalent prices and arrivals, importing countries and export opportunities, etc. Crops specific to particular season, particular location of the user will be displayed on the bar. More option will be provided to access other crops not listed on the bar.

### **3.1.10 Video**

The latest video will be displayed here. Using start button, user will be able to watch video.

### **3.1.11 Ask the expert**

User can ask his queries to experts using this interface provided on the home page. This is the link for external users to access Expert Management System. Expert Management System will be further integrated with Knowledge Management Database developed under Kisan Call Centre (KCC) project of the Extension Division of Department of Agriculture & Cooperation. The answers for the queries will be searched in this knowledge base first before escalating these to the experts. The detail specifications of the Expert Management System have been provided in the subsequent sections.

### **3.1.12 Message Board**

Important messages for the stakeholders will be displayed here. While messages on the message board will be seen by all, the privilege for uploading messages using Content Management

System will be provided to only selected internal users. Specifications of the Content Management System have been given in subsequent sections.

### **3.1.13      Lodge your Grievance**

Registered user of the portal will be able to post their grievances and see the status of their grievances using this link. This link will also lead to the page providing statistics of the grievances addressed so far, pending (location wise, officer wise, category wise) etc. in dash board formats. Specifications of the Grievance Redressal and Management System have been given in subsequent sections.

### **3.1.14      Farmer's Corner**

This link will allow farmers to access farmer specific contents and services in a single window and upload the content for success stories, events, highlights, blogs, discussions, etc.

### **3.1.15      Industry Corner**

This link will allow industry people to access industry specific content in a single window like rules and regulations, Rules for Certification for Importing and Exporting of plant material, Fees, locations, markets, Fees, Online application, Forms to be downloaded etc. It will also allow them to participate in discussions, upload blogs, etc.

### **3.1.16      National Farmer's Database**

This link will provide the linkage to National Farmer's database and various statistics about this database. For example – Farmers registered Education levels, land ownership, debt status, etc.

### **3.1.17      Expert Advisory System**

This link will be visible only to internal users. On accessing this link experts having privileges to use this system will be displayed dashboard. Experts will be able to view the list of pending queries and answer the queries using this system. The answers provided by experts will further be used in enriching the knowledge Management database developed under KCC.

### **3.1.18      Knowledge Management**

Using Knowledge Management link, user will be able to load the content in Content Management System. List of only those sections will be provided to user for which he has privileges to load the content.

### **3.1.19 Media Gallery**

Accessing this link will lead to the repository of audio, video, picture content. Facility to search the audio, video and picture content based on criteria specified by user, will be provided.

### **3.1.20 Circulars**

User will be able to see various circulars using this link. Circulars will be uploaded by internal users having necessary privileges.

### **3.1.21 Apply Online**

Using this link, farmers will be able to apply online for financial assistance under various schemes and wholesalers, dealers, retailers, exporters, importers, etc will be able to apply for various types of certificates necessary for their business.

### **3.1.22 Download Forms**

Facility to download various types of forms.

### **3.1.23 Service Icons Window**

Service icons window is placed at the central portion of the home page and displays the iconic links to access various services proposed under NeGP Agriculture Mission Mode Project. The details of these services and sub-services are covered under Software Requirements Specifications of these services.

### **3.1.24 Daily Prices**

Bar for daily prices will display the latest prices of important agriculture commodities.

### **3.1.25 Top Story**

This section will display the top story as uploaded by user using Content Management System and approved by site manager.

### **3.1.26 Events**

This section will display the event details as uploaded by users using Content Management System and approved by site manager.

### **3.1.27      Highlights**

This section will display the highlights as uploaded by users using Content Managements System and approved by site manager.

### **3.1.28      Latest Blogs**

This section will display the list of latest blogs.

### **3.1.29      Map**

In future, Map will provide GIS interface of the portal. By clicking on particular state user will be able to access State Agricultural Portal (SAP) of that state. User will be able to drill down further to access state, district or block. On accessing particular location user will be able to access various types of information about that particular geographical area like crop grown in that particular area, climatic conditions, soil types, markets, procurement points, irrigation infrastructures, storage facilities, Dealers, wholesalers, retailers, Livestock, Scheme and program implementation status, etc.

### **3.1.30      Search Box**

In search box, user will be able to provide keyword based on which content will be searched on local site and results will be displayed to user.

### **3.1.31      News and Updates**

This section will display list of News items. It will be scrolling list with facility for user to stop the scrolling, scroll vertically as desired and click particular news item to access more details about that news item.

### **3.1.32      Alerts**

This section will display scrolling list of various alerts. It will be the scrolling list with facility for user to stop the scrolling, scroll vertically as desired.

### **3.1.33      Announcements**

This section will display scrolling list of various announcements. It will be the scrolling list with facility for user to stop the scrolling, scroll vertically as desired.

### **3.1.34      Calendar**

Calendar will have facility to display events like conferences, training programs, etc. After clicking particular event more details of the event will be displayed like duration, topic, brief description, organizers, venue, etc.

### **3.1.35      Kissan Call Centre**

This link will provide information about Kissan Call Centre, procedure to make a call, toll free number to call, etc.

### **3.1.36      Radio**

This link will provide information about the Agricultural related radio programs, program schedules etc.

### **3.1.37      Doordarshan**

This link will provide information about the Agriculture related television programs, program schedules, etc.

### **3.1.38      e-Governance Projects**

This bar will list links for various e-Governance Projects being implemented in Agricultural sector.

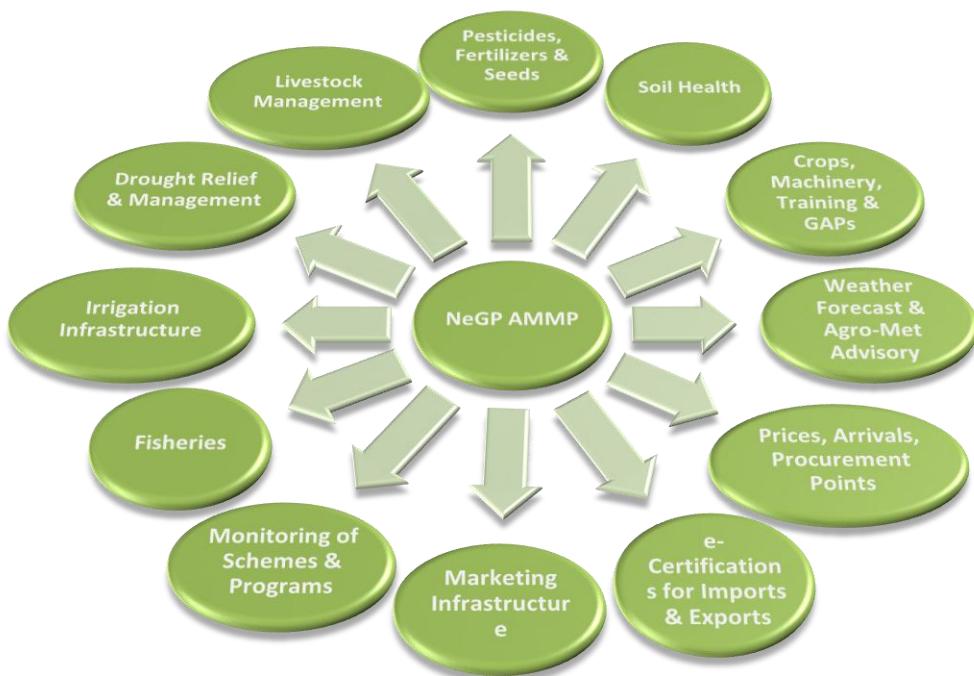
### **3.1.39      Portal Information Bar**

This bar will provide links to access information about portal like About portal, Help, Terms of use, visitor's summary, and Accessibility statement. It will also provide the link for giving feedback and suggestions for improvement and enrichment of the portal services. User can subscribe to newsletter on agriculture by accessing Newsletter link.

**Figure - 11: Home Page of the Central Agricultural Portal (Theme – Orange)**

## 3.2 User Interfaces for services

There are 12 Service Clusters identified under NeGP-Agriculture Mission Mode Project as depicted in Figure 12. Link will be provided from the home page of Central Agricultural Portal to access each Service Cluster specific page.



**Figure - 12: Service Clusters under NeGP-Agriculture Mission Mode Project**

The following sections gives information about the service specific pages planned for each service under NeGP-Agriculture Mission Mode Project. The links are for demonstrative purpose only and the Service specific SRS will specify all links in detail. At the time of designing the portal, the links on these pages will be depicted in pictorial form wherever appropriate. The User is directed to these pages from the Central Agricultural Home Page. From these pages user can go back to the Home Page anytime by clicking on “Home” or access the other Service specific page by clicking on the link provided for that particular service.

Each service specific page will have the link “News” to access News with respect to that service. It will also have the link “Subscribe”. Accessing this link user will be able to specify his service specific requirements for information delivery through e-mail, SMS etc. For e.g. to get market prices information user will be able to specify the names of markets and commodities for which information is required by him through SMS or e-mail.

### 3.2.1 Pesticides

Figure 13 depicts the user interface for pesticides. All the links leading to pesticides related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture portal's main dashboard. At the top, there are language selection options (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), accessibility options, and a font size selector. The header features the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". Below the header is a navigation bar with links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. A sidebar on the left includes links for Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The main content area is titled "Pesticides" and lists links for Pesticides Availability & Prices (Company/ Manufacturer wise), IPM Package of Practices, Locate Dealer, Know about Pesticides, National Schemes, Pesticides Policy and guidelines, Pesticides usage in India, National Pesticides Testing Laboratories, Pesticide Licensing, Pesticide Registration, Licensing Process for Pest Control Operation at State/ Range Level, Pesticides Quality Testing, License Status Tracking, Manage Pesticides Product, Grievance Redressal, Expert Advisory, and FAQ. There is also a "Subscribe" button. The footer contains links for the e-Governance Project (AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA), About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion, Related Links, Accessibility Statement, and a note from the National Informatics Centre (NIC). The footer also states that the site is designed by NIC.

Figure - 13: User Interface for Pesticides

### 3.2.2 Seeds

Figure 14 depicts the user interface for Seeds. All the links leading to Seeds related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture portal's user interface for the Seeds section. At the top, there is a green header bar with the NeGP logo, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), and accessibility options. Below the header is a banner featuring the NeGP logo and the text "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation menu includes "CROPS :: Rice | Wheat | Cashewnuts | Cotton | Jute | Banana | Grapes | Orange | Pine Apple | more..." and various agricultural icons for Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation. A sidebar on the left lists links such as Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled "Seeds" and contains a list of services: Seeds Availability & Prices, IPM Package of Practices, Locate Dealer, Information on Seed varieties, Area wise recommendation for seeds in India, Seeds at a glance, Seed Village Programme and Schemes, Seeds Licensing, Seeds dealer Registration, Seeds Quality Testing, License Application Status Tracking, Manage Seeds Product, Grievance Redressal, Expert Advisory, and FAQ. There is also a "News" section and a "Subscribe" button. At the bottom, there is a footer with links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "Governance Project" section. The footer also includes a statement about the site being designed by NIC and the NIC logo.

**Figure - 14: User Interface for Seeds**

### 3.2.3 Fertilizers

Figure 15 depicts the user interface for Fertilizers. All the links leading to Fertilizers related information and applications will be available from this page.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the text "Select Language" followed by links to various Indian languages: Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, and Telugu. Below this is another row of links: Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme (with color swatches), Font Size (with A A A A icons), and Font Size (with a magnifying glass icon).

The main header features the NeGP Agriculture logo with the tagline "EMPOWERING FARMERS". To its right is the text "Department of Agriculture & cooperation" and "Ministry of Agriculture, Government of India". Below the header is a decorative background image of a tree and a cow.

The navigation menu includes "CUSTOMIZE" and "MY AGRI" on the left, and "Login" and "Password" fields with a "Login" button on the right. Below the menu is a horizontal bar with categories: Crops :: Rice | Wheat | Cashewnuts | Cotton | Jute | Banana | Grapes | Orange | Pine Apple | more... . Underneath this are several circular icons representing different agricultural topics like Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation.

The main content area has a breadcrumb trail "Home > Fertilizer" and a "SEARCH BOX" with a "GO" button. On the left, there is a sidebar with a list of links: Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The main content area has a section titled "Fertilizer" with a green circular icon. It contains links to National information on Prices and Availability, Fertilizer policy, National Fertilizer Testing Laboratories, FMS Application, Related Website, Usage on Organic Fertilizer, and Fertilizer usage at a glance. There are also "News" and "Subscribe" sections.

The footer contains links to various government databases: AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, and MMA. It also includes links to About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. A large paragraph of placeholder text follows. The footer also states "The site is designed by 'National Informatics Centre, Ministry of Communications and Information Technology, Government of India'" and features the NIC logo.

**Figure - 15: User Interface for Fertilizers**

### 3.2.4 Soil

Figure 16 depicts the user interface for Soil. All the links leading to Soil related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture portal's homepage with a focus on the 'Soil Health' section. At the top, there is a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text 'Department of Agriculture & cooperation Ministry of Agriculture Government of India'. The main navigation menu includes 'CROPS' (with sub-links for Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, and more...), 'SERVICES' (with sub-links for Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fairies, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation), and a 'SEARCH BOX' with a 'GO' button. On the left, a sidebar lists various links under 'Home-> Soil Health'. The central content area features a large image of a plant and the heading 'Soil Health' with a list of links: 'Soil Health & Soil Health Card', 'Organic Farming', 'Soil Survey', 'Soil Survey Maps', 'Package of Practices suitable to Soil Type', 'Soil Testing Labs', and 'Balanced use of Fertiliser (In-Organic / Organic)'. At the bottom, there is a footer with links to 'Governance Project', 'AGMARKNET', 'DACNET', 'Agricultural Census', 'Seednet', 'Nav Krishi', 'RKVY', 'MMA', 'About this Portal', 'Help', 'Terms of Use', 'Visitor Summary', 'Newsletter', 'Your Opinion!', 'Related Links', 'Accessibility Statement', and a note about demo text. The footer also includes the 'NIC' logo and a statement about the site being designed by the National Informatics Centre.

**Figure - 16: User Interface for Soil Health**

### 3.2.5 Irrigation

Figure 17 depicts the user interface for Irrigation. All the links leading to Irrigation related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture portal's irrigation section. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gurjari, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India". The main navigation menu includes "CROPS" (with sub-links for Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, and more...), "AGRICULTURE" (with sub-links for Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and "HOME" (with sub-links for Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms). A search box is also present. On the right, there's a sidebar titled "Irrigation" with links to Water Release Schedule, Command Area Development, Irrigation Equipments, Best Irrigation Practices, Water requirements for standing crop, GIS mapping, NOC to Abstract Ground Water by CGWA, Water Reservoirs and water bodies, Canal Network, Ground Water Information, Watersheds, Water logging and land degradation, FAO, and Identification of Beneficiaries. A "Subscribe" button is located at the bottom right of the sidebar. The footer contains links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "GO" button. It also features a "Governance Project" section with links to About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. The footer also includes a "NIC" logo and a note about the site being designed by the National Informatics Centre.

**Figure - 17: User Interface for Irrigation**

### 3.2.6 Farm Machinery

Figure 18 depicts the user interface for Farm Machinery. All the links leading to Farm Machinery related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture Central Agricultural Portal. At the top, there's a green header bar with language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". The main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. A sidebar on the left lists links like Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled "Farm Machinery" and lists links for Farm Machinery Dealers, Machinery Stock and Availability, Machinery and Equipments Prices, Guidance for Usage, Procurement of Farm Machinery, Input Subsidy (Procedures, Apply online, Application status, Disbursement), and a "Subscribe" button. At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various portal policies. It also includes a "Some demo text about this portal" placeholder and a credit line to NIC.

**Figure - 18: User Interface for Farm Machinery**

### 3.2.7 Crops

Figure 19 depicts the user interface for Crops. All the links leading to Crops related information and applications will be available from this page.

The screenshot shows the NeGP Agriculture portal's homepage. At the top, there is a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gurjari, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and font size controls. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". The main navigation menu includes links for Crops, Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, and more. A secondary navigation bar below the main menu lists various agricultural services like Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation. On the left, a sidebar menu lists links such as Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled "Crops" and contains a list of management tools: Crop Cycle Management, Soil Management, Land Management, Water Management, Plant Health, Pest Prevention and cure, Area, Production, Yield (APY), Strategic Research and Extension Plan (SREP), Comprehensive District Agricultural Plan (CDAP), State wise Contingency Plan, FASAL Reports, and Farm Level Planning. At the bottom, there is a footer with links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a governance project section. The footer also includes a statement about the site being designed by NIC and the NIC logo.

**Figure - 19: User Interface for Crops**

### 3.2.8 Livestock

Figure 20 depicts the user interface for Livestock. All the links leading to Livestock related information and applications will be available from this page.

The screenshot shows the NeGP-AMMP Central Agricultural Portal's user interface for the Livestock section. At the top, there is a green header bar with the Indian national emblem, a 'Select Language' dropdown, and links for Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujrati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, and Telugu. Below this is another row of links for Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme (with color swatches), and Font Size (A A A). The main navigation bar features the 'NeGP AGRICULTURE EMPOWERING FARMERS' logo, the 'Department of Agriculture & cooperation' text, and the 'Ministry of Agriculture, Government of India'. The top menu includes 'CUSTOMIZE' and 'MY AGRI' buttons, and a 'Login' button. Below the menu is a horizontal bar with links for various agricultural topics like Crops, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, etc. A 'SEARCH BOX' with a 'GO' button is also present. The left sidebar contains a vertical list of links: Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled 'Livestock' and features a large image of a sheep. It lists several categories: Infrastructure Availability, Livestock and Poultry Health Management, Diseases and control, Feed and Fodder Management, Fodder seed availability, Hatchery units and feed mills, Breed Management, Housing Management, Waste Management, Services, Artificial Insemination, Veterinary Services, Vaccination, Insurance, Registration of animals, Marketing of Livestock products, Import and Export, Training and Extension, and Schemes and programs. A 'Subscribe' button is located at the bottom right of this list. At the bottom of the page, there is a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a 'Governance Project' section. It also includes links for About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. The footer also contains a 'NIC' logo and a note about the site being designed by the National Informatics Centre.

**Figure - 20: User Interface for Livestock**

### 3.2.9 Fisheries

Figure 21 depicts the user interface for Fisheries. All the links leading to Fisheries related information and applications will be available from this page.

The screenshot shows the NeGP Central Agricultural Portal's user interface for the Fisheries section. At the top, there is a green header bar with the NeGP logo, a 'Select Language' dropdown, and various site navigation links like Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, and Font Size. Below the header, the main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a 'Home -> Fisheries' link. A search box is also present. The central content area features a large green fish icon and the heading 'Fisheries'. To the left is a sidebar with links to Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. To the right, there is a 'News' section with a list of topics under 'Fisheries' and a 'Subscribe' button. At the bottom, there is a footer with links to Governance Project, AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, Accessibility Statement, and a note about demo text. The footer also includes the NIC logo and a statement about the site being designed by the National Informatics Centre.

**Figure - 21: Use Interface for Fisheries**

### 3.2.10 Training and Extension

Figure 22 depicts the user interface for Training and Extension. All the links leading to Training and Extension related information and applications will be available from this page.

The screenshot shows the NeGP-AMMP portal's main navigation bar at the top, featuring the logo, language selection (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gurjarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and site map.

The main content area is titled "Department of Agriculture & cooperation" and "Ministry of Agriculture, Government of India". It features a green header with the "NeGP AGRICULTURE EMPOWERING FARMERS" logo and a background image of a person working in a field.

The navigation menu includes "CROPS" (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Gapes, Orange, Pine Apple, more...) and various agricultural services like Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation.

The "Training and Extension" section is highlighted in the breadcrumb trail: Home -> Training and Extension. This section contains a sub-menu with links to Message Board, Grievance Management, Farmer's Corner, Industry Center, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms.

The main content area for "Training & Extension" features a circular icon of two people and lists several resources:

- Training Calendars
- Videos on Good Agricultural Practices (GAPs)
- Audios on Good Agricultural Practices (GAPs)
- Digital tool kits
- Front Line demonstrations
- Success stories

On the right side of the content area, there are "News" and "Subscribe" buttons. At the bottom, there are links to other projects like AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "About this Portal" link.

**Figure - 22: User Interface for Training and Extension**

### 3.2.11 Good Agricultural Practices (GAPs)

Figure 23 depicts the user interface for Good Agricultural Practices. All the links leading to Good Agricultural Practices related information will be available from this page.

The screenshot shows the homepage of the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gurabi, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, site map, add to favorite, tell a friend, RSS, select theme, font size, and a login field.

The main header features the logo 'NéGP AGRICULTURE EMPOWERING FARMERS' and the text 'Department of Agriculture & cooperation Ministry of Agriculture Government of India'. Below the header is a banner with a tree and a cow.

The navigation menu includes 'CUSTOMIZE' and 'MY AGRI' on the left, and 'Login' and 'Password' fields on the right. Below the menu is a horizontal bar with links for various crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...) and agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation).

The main content area has a breadcrumb trail 'Home -> Good Agricultural Practices (GAPs)' and a search box. On the left, there is a sidebar with links to 'Message Board', 'Grievance Management', 'Farmer's Corner', 'Industry Corner', 'National Farmer's Database', 'Expert Advisory System', 'Knowledge Management', 'Picture Gallery', 'Circulars', 'Apply Online', and 'Download Forms'. In the center, there is a circular icon with a stylized tree and the title 'Good Agricultural Practices (GAPs)'. To the right, there is a list of GAP categories:

- GAP for Crop production
- GAP for Animal production
- GAP for Fisheries production
- GAP for production of Fruits
- GAP for production of Vegetables
- GAP for Medicinal Crops
- GAP for Fodder production
- GAP for Soil and Water
- GAP for Pesticide use
- GAP for Fertilizers use
- GAP for Fodder production
- GAP for Fisheries production
- GAP for Harvesting and Storage
- GAP for Processing

A 'Subscribe' button is located at the bottom right of this list. The footer contains links to 'Governance Project : AGMARKNET | DACNET | Agricultural Census | Seednet | Nav Krishi | RKVY | MMA', 'About this Portal | Help | Terms of Use | Visitor Summary | Newsletter | Your Opinion! | Related Links | Accessibility Statement', and a large text block of placeholder demo text. The footer also includes the NIC logo and the text 'The site is designed by "National Informatics Centre, Ministry of Communications and Information Technology, Government of India"'.

**Figure - 23: User Interface for Good Agricultural Practices (GAPs)**

### 3.2.12 Prices and Arrivals

Figure 24 depicts the user interface for Prices and Arrivals. All the links leading to Prices and Arrivals related information will be available from this page.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there's a green header bar with the Indian national emblem, the text "Select Language" followed by links to various Indian languages, and accessibility options like "Font Size A A A". Below the header is the "NoGP AGRICULTURE EMPOWERING FARMERS" logo and the "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation menu includes "CROPS" (with sub-links for Rice, Wheat, etc.), "SERVICES" (with sub-links for Seed, Pesticides, Fertilisers, etc.), and "MARKETING" (with sub-links for e-Market, Procurement Points, Marketing Infrastructure, etc.). A sidebar on the left lists links such as Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area features a "Prices and Arrivals" section with a sub-menu for Agricultural Crops, Fisheries, Livestock, Milk, Fodder, Medicinal Plants, Aromatic Plants, and Forest Products. There are also links for Minimum Support Price, Estimated Demands, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation. A "GO" button is located next to a search box. The footer contains links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "Subscribe" link. It also includes a "Governance Project" section with links for About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. The footer also notes that the site is designed by NIC and contains some demo text about the portal.

**Figure - 24: User Interface for Prices and Arrivals**

### 3.2.13 e-Market

Figure 25 depicts the user interface for e-Market. All the links for e-Market will be available from this page.

The screenshot shows the homepage of the NeGP Agriculture e-Market portal. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". A banner features a tree and a person in a field. The main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. On the left, a sidebar lists links like Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled "e-Market" with sub-links for Register, Post your Purchase Query, Post your Sales Query, Product Catalogue, Directory Listing, Taxes, Transport availability, Geographical Distances, and Storage Facilities. At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various portal policies. A note about the demo text is present, followed by a design credit to NIC.

**Figure - 25: User Interface for e-Market**

### 3.2.14 Procurement Points

Figure 26 depicts the user interface for Procurement Points. All the links leading to Procurement Points related information will be available from this page.

The screenshot shows the NeGP Central Agricultural Portal's main interface. At the top, there is a green header bar with the Indian national emblem, a 'Select Language' dropdown, and various site navigation links like Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, and Font Size. Below the header is the NeGP logo and the text 'Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India'. The main menu includes 'CROPS ::' followed by a list of crops: Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Gapes, Orange, Pine Apple, and more... Below this is a horizontal bar with various agricultural service icons such as Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation. A sidebar on the left lists links like Message Board, Grievance Management, Farmer's Corner, Industry Center, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area features a large green circular icon with a stylized house and the title 'Procurement Points'. To the right of the title is a list of sub-links: Procurement Points, Procurement Schedule, Address, Distance, Commodity associated, and Quality conditions like moisture content. At the bottom of the page, there is a footer bar with links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion, Related Links, Accessibility Statement, and a long block of demo text. The footer also includes the NIC logo and a note about the site being designed by NIC.

**Figure - 26: User Interface for Procurement Points**

### 3.2.15 Marketing Infrastructure

Figure 27 depicts the user interface for Marketing Infrastructure. All the links leading to Marketing Infrastructure related information will be available from this page.

The screenshot shows the NeGP Central Agricultural Portal's homepage. At the top, there is a green header bar with language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gurabi, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". A navigation bar below the logo includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. On the left, a sidebar lists links such as Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The main content area features a graphic of a house with a green arrow pointing up, titled "Marketing Infrastructure". To the right of the title is a "News" link and a "Subscribe" link. Below the title is a list of sub-links: Storage Infrastructure (Godowns, Rural Godowns, Cold Storages, Warehouses), Market Profile, and Standards. At the bottom of the page, there is a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, Accessibility Statement, and a "Some demo text about this portal" section. The footer also includes the NIC logo and the text "The site is designed by 'National Informatics Centre, Ministry of Communications and Information Technology, Government of India'".

**Figure - 27: User Interface for Marketing Infrastructure**

### 3.2.16 Export and Import

Figure 28 depicts the user interface for Export and Import. All the links leading to Export and Import related information will be available from this page.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the Indian national emblem, a 'Select Language' dropdown, and links for Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Orya, Punjabi, Santhali, Sindhi, Tamil, and Telugu. Below this is a banner for 'Accessibility Options' with icons for screen reader, site map, add to favorite, tell a friend, RSS, select theme, and font size. The main navigation bar features the 'NeGP AGRICULTURE EMPOWERING FARMERS' logo, the 'Department of Agriculture & cooperation Ministry of Agriculture Government of India' text, and a background image of a tree and a sheep. The navigation menu includes 'CROPS' (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services like Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation. A 'Home -> Export and Import' breadcrumb trail is visible. The central content area is titled 'Exports and Imports' and contains sections for Plant Quarantine, Animal Quarantine, Certification Procedures, Fees and Charges (with sub-links for Inspection, Treatment Supervision, Permit, Laws, and Standards), Shipping, Import, Export, Travel, Operational Guidelines for Exporters and Importers, and Quarantine Alert. There is also an 'Apply Online' button. On the right side, there are 'News' and 'Subscribe' sections. The footer includes links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various portal policies like About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion, Related Links, and Accessibility Statement. It also features the NeGP logo, a 'Some demo text about this portal' placeholder, and a NIC logo at the bottom right.

**Figure - 28: User Interface for Export and Import**

### 3.2.17 Weather and Agro-met Advisory

Figure 29 depicts the user interface for Weather and Agro-met Advisory. All the links leading to Weather and Agro-met Advisory related information will be available from this page.

The screenshot shows the NeGP Agriculture portal's main dashboard. At the top, there is a navigation bar with links to various languages (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Odia, English, Gujarati, Kashmiri, Konkani, Halkhani, Manipuri, Nepali, Punjabi, Santali, Sindhi, Tamil, Telugu) and accessibility options (Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, Font Size). The main header features the NeGP logo and the text "Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India". Below the header, there is a green banner with the text "WELCOME 'USER NAME' | SIGN OUT". The dashboard is divided into several sections:

- CUSTOMIZE | HYACRI:** Includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple), Seeds, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crops, Livestock, Fisheries, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Weather and Agro-met advisory, Drought Relief and Management, Procurement Points, Schemes and Programs, Training & Extension, Marketing Infrastructure, Exports and Imports, Monitoring Implementation, and Download Forms.
- Weather and Agro-met advisory:** This is the active section, indicated by a blue border. It contains a sub-menu with the following items:
  - Authorities
  - Latest News events
    - Agro-met Advisory
    - Agro-met News
  - Subscribe to Newsletter
  - Agro climatic zone classification
    - National level
    - State level
    - District level
  - Weather based agro Advisory
    - 5 Tier details
      - Ministry Policy
      - IMD Pune
      - Met center
      - Agro met field units
      - KVK
    - National PRIORITY AREAS (common areas)
    - State priority areas (agro climatic zone wise)
    - Dissemination of advisories
      - Email
      - Sms
      - Radio
      - Doordarshan
      - Newspaper
    - Best Practices (On the basis of agro climatic zone)
      - General Condition
      - Extreme Condition
      - Contingency Plan
    - End user and stakeholder feedback
      - Risk Factor (local level)
    - End user query redressal
    - Scroll information on current day weather
    - Service Provider

- News:** A link to the news section.
- Subscribe:** A link to subscribe to newsletters.
- Governance Project:** A link to the governance project section.
- Footer:** Includes links to AGMARKNET, DACNET, AGRICULTURAL CENSUS, SEEDNET, NAV KRISHI, RKVY, MMA, About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion, Related Links, Accessibility Statement, Directory, Acts and Regulations, and the NIC logo.

Figure - 29: User Interface for Weather and Agro-met advisory

### 3.2.18 Drought Relief and Management

Figure 30 depicts the user interface for Drought Relief and Management. All the links leading to Drought Relief and Management related information will be available from this page.

The screenshot shows the NeGP Agriculture portal's homepage with a focus on the 'Drought Relief and Management' section. The top navigation bar includes language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), accessibility options, and site links. The main header features the NeGP logo and the text 'Department of Agriculture & cooperation, Ministry of Agriculture, Government of India'. Below the header is a navigation menu with links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. A sidebar on the left lists links like Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area displays the 'Drought Relief and Management' section with sub-links for Drought Tracking, Drought Management, and Practices to be adopted by Farmers in Drought like situations. At the bottom, there are links for the Governance Project, About this Portal, and a note from NIC.

**Figure - 30: User Interface for Drought Relief and Management**

### 3.2.19 Schemes and Programs

Figure 31 depicts the user interface for Schemes and Program. All the links for Schemes and Programs related information will be available from this page.

The screenshot shows the NeGP-AMMP portal's main navigation bar at the top, featuring language selection (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gurjari, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), accessibility options, and a logo for the Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

The main content area is titled "Department of Agriculture & cooperation" and "Ministry of Agriculture, Government of India". It features a green header with various agricultural icons and links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation, Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, and a Home link.

The "Schemes and Programs" section is highlighted in the center. It includes a sub-menu with links to Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. To the right, there are links for Schemes and Programs, Annual Action Plans, Guidelines for Schemes, Benefits to Farmers, Beneficiaries, Funds Allocation, Release and Utilisation, Subsidies, and Apply online. A "News" link is also present.

The footer contains links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krish, RKVY, MMA, and a "Subscribe" button. It also includes a "Governance Project" section with links to About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. A large text block in the footer discusses the governance project. The bottom of the page states "The site is designed by 'National Informatics Centre, Ministry of Communications and Information Technology, Government of India'" and features the NIC logo.

**Figure - 31: User Interface for Schemes and Programs**

### 3.2.20 Monitoring Implementation of Schemes

Figure 32 depicts the user interface for Schemes Monitoring. All the links for monitoring Schemes being implemented by Central, State and District will be available from this page.

The screenshot shows the NeGP Agriculture e-Monitoring portal. At the top, there's a green header bar with the Indian flag, the text 'Select Language' followed by links to various Indian languages, and accessibility options like 'Font Size A A A'. Below this is a banner for the 'Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India' featuring a tree and a person in a field.

The main navigation menu includes 'CUSTOMIZE' and 'MY AGRI' on the left, and 'Login' and 'Logout' buttons on the right. Below the menu is a horizontal bar with icons for various agricultural sectors: Crops (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery), Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation.

The breadcrumb navigation shows 'Home -> Monitoring Implementation of Schemes'. On the right, there's a 'SEARCH BOX' and a 'News' feed with a '60' notification. A 'Monitoring Implementation' section features a circular icon with a graph and a list of five items under a blue header:

- Schemes and Programs
- Physical and Financial monitoring of schemes
- Issuance and submission of Utilization Certificate
- Evaluation reports of schemes
- Calendar of activities for evaluation work

On the left, a sidebar lists links such as Message Board, Grievance Management, Farmer's Corridor, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. At the bottom, there's a footer with links to various projects like AGMARKNET, DACNET, and others, along with a 'Subscribe' button. The NIC logo is also present at the bottom right.

**Figure - 32: User Interface for e-Monitor**

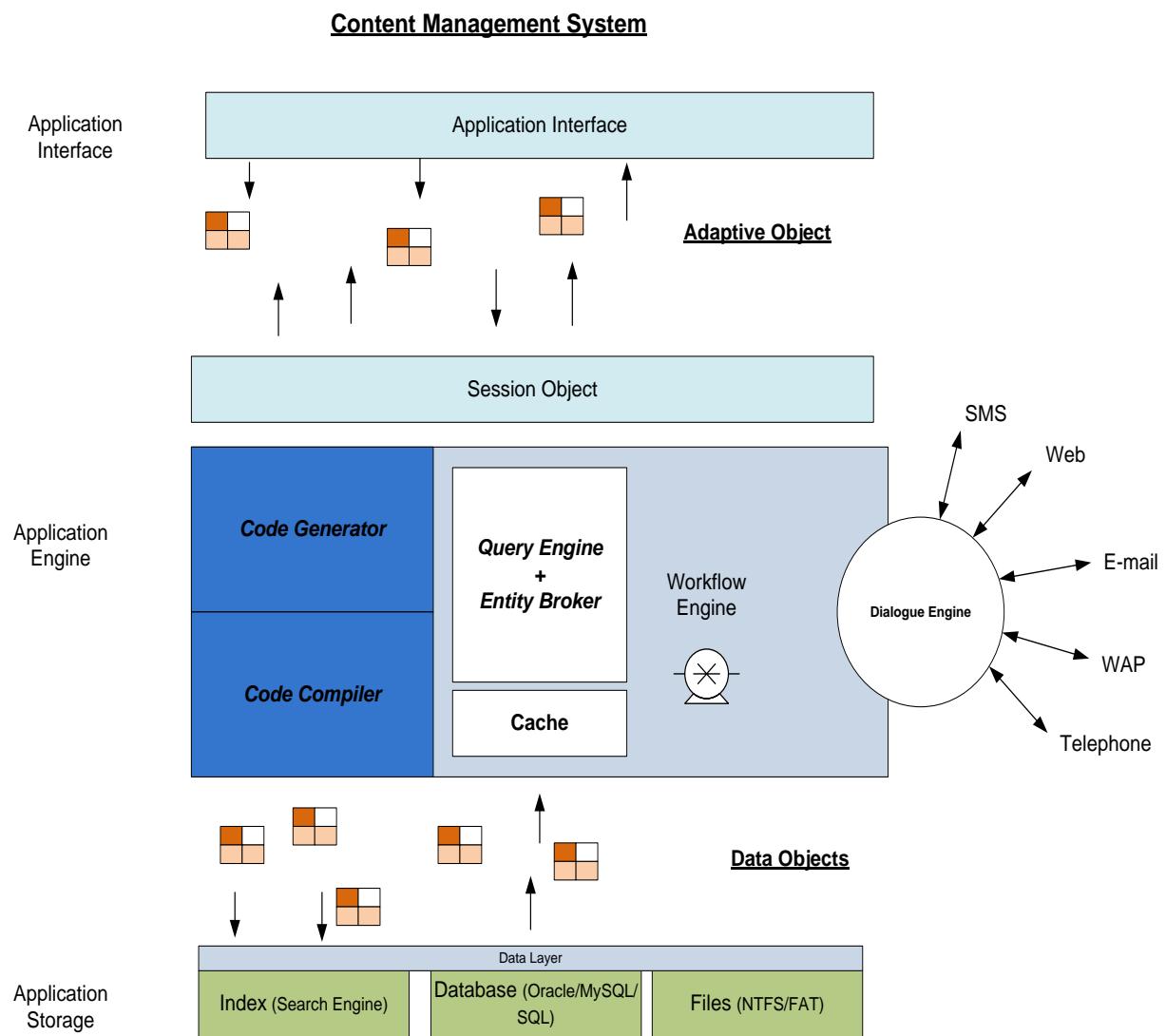
## 4 Content Management System – a framework

The Content Management System for Central Agricultural Portal will be web based and workflow-driven to ensure that only approved and correct content is uploaded on the portal. The content in the Central Agricultural Portal will be the result of a collaborative effort of various Indian Government Ministries and Departments, at the Central, State, District and block level, ICAR Institutes, State Agricultural Universities and colleges, ATMA, KVKS, etc. These sources will contribute content in different forms and formats, structured or unstructured, with or without metadata using different taxonomies and vocabularies. It will create huge content repository for Agricultural Sector. Central Agricultural Portal needs to organize content and deliver information to end users as per their expectations. It will help avoiding redundancy and duplication of efforts at the same time it will provide comprehensive, accurate and reliable content about agriculture to all stakeholders.

Content Management System of CAP should provide web based interface for content authoring, submission, review, approval and publishing. All government departments and organisations should be provided requisite access so that they can contribute content with ease. To make this content accessible to the farmers and other stakeholders in a unified and meaningful manner, it is imperative to have a high degree of uniformity and consistency in its structure and form. The content framework described in subsequent sections here aims to serve this purpose. It provides details about type, formats and the attributes for each content element as well as entry, review, update and exit policies for different content elements. It also provides guidelines for all those who will be responsible for generating, packaging and contributing the content for the portal.

### 4.1 Content Management System - System Architecture

The System Architecture of the Content Management System consists of the Content Engine, which is connected to the Directory Services through LDAP, Application Engine, Workflow engine, Search engine and Application storage. Application Interface is at the top level of the architecture of the Content Management System. The Application Storage is at the bottom level. The Application Engine communicates with the Application Storage with the help of Data Objects. The Application Storage consists of the Indexes (Used by Search Engine), Databases and Files. Figure 33 depicts system architecture for Content Management System.



**Figure - 33: Content Management System – System Architecture**

## 4.2 Content Management – Major components

Major components for Content Management are

- Content Repository
- Content Management Utility
- Content Search
- Content Explorer to view / download the content
- Content Metadata Repository

## 4.2.1 Content Repository

Central Agricultural Portal is expected to have volume of information. Content belonging to Central Agricultural Portal would be stored in content repository of Central Agricultural Portal. Central Agricultural Portal would use a "Content management system" to store and manage content.

Central Agricultural Portal content repository would have defined standard functionality.

## 4.2.2 Content Management Utility

It will be used to manage the creation, modification, approval and removal of the content of the portal. After accessing this utility, list of all folders and subfolders where the specific contents reside and for which user has privileges will be displayed to the user after verifying his/her credentials. User will be able to select the folder/subfolder depending on category, sub-category of the content and upload it for approval/publishing.

## 4.2.3 Content Search

Central Agricultural Portal should have powerful user friendly search functionality. It should provide metadata and 'full text search' based search functionality. Users will be allowed to search specific information, view and download it using this utility.

There are two aspects of the search – the searching of the site itself and the searching of the databases or catalogues which are accessed via the site.

The searching of the site itself can be facilitated by the use of metadata (META) tags in the page headers of each page. In addition, a site search tool may also be in place, with a documented interface to allow it to be invoked remotely.

Search functionality should be exposed as a web service so that Central Agricultural Portal along with State Agricultural Portals can provide integrated search functionality. For providing search functionality, Central Portal should comply within defined processes for defining metadata, managing metadata schema changes and master data changes. Central Agricultural Portal may need the ability to be searched remotely to make it more useful and interoperable with State Agricultural portals. This can be achieved with distributed search functionality. Distributed search of site itself may use page-level META tags, a site map and/or a site search tool.

Distributed search of catalogues and databases and the searching of catalogues and databases hosted on the site may involve implementing Search Retrieval Web Service / Search Retrieval via URL (SRW/SRU) Web services interface. However, a subset of such functionality can also be exposed by having a consistent web search interface.

SRU (Search Retrieval via URL) is a standard XML-focused search protocol for Internet search queries, utilizing CQL (Contextual Query Language), a standard syntax for representing queries. Current SRU version is 1.2.

Disclosure functionality should use a standard technology such as the OAI PMH protocol (Open Archives Initiative Protocol for Metadata Harvesting) developed by the Open Archives Initiative. It is used to harvest (or collect) the metadata descriptions of the records in an archive so that services can be built using metadata from many archives. An implementation of OAI-PMH must support representing metadata in Dublin Core, but may also support additional representations. The protocol is usually just referred to as the OAI Protocol. OAI-PMH uses XML over HTTP. The current version is 2.0, updated in 2008.

Advance Search facility will be provided that will be able to index and organize vast amount of information optimally.

Following would be the key search functionality on Central Agricultural Portal -

- a. Users should be able to search within a Central Agricultural Portal
- b. Provide unified user interface to perform above search, through 'full text search' capability
- c. Provide metadata based search capability
- d. Provide hierachal (tree) type user interface to explore content

#### **4.2.4 Content Explorer to view / download the content**

Content explorer will be a web application for browsing the content of Central Agricultural Portal. It would also be available to browse the content of all State Agricultural Portals using "consolidated metadata repository". This interface will be similar to 'explorer' application available on Windows operating system or browsing application provided by analyst site like forrester.com.

Content explorer would have a defined standard user interface so that user will have same experience on Central Agricultural Portal as well as all State Agricultural Portals.

#### **4.2.5 Content Metadata Repository**

Content metadata repository would store and manage metadata of all content published on Central Agricultural Portal. It will store metadata in normalized form. Normalization will enable high quality search results and provide semantic integration of the content on Central Agricultural Portal.

Content metadata repository would have a well defined standard metadata schema and normalized values for metadata based on well defined standard master data.

## 4.3 Content Management System – Features and Capabilities

Content management systems should have the following (but not limited to) features or capabilities-

- a. Should facilitate storage and easy retrieval of Content
- b. Should facilitate repository management
  - a. Content authoring and publishing
  - b. Content reviewing to control data validity and compliance
  - c. Content delivery in desired format
  - d. Content exit and archival
- c. Improved communication among users by providing collaborative environment.  
Allow for a large number of people to share and contribute to stored data
- d. Content repurposing for different audience and for different interfaces
- e. Email notifications for automated content edits and reviews
- f. Reduced duplicate inputs
- g. Native content conversion to web formats
- h. Provide searching and retrieving of content based on various criteria
- i. Browser based interface
- j. Controlled access to data based on user role (i.e., facility to define information users or user groups who can view, edit, publish, etc.)
- k. Simplify report writing
- l. Allow Defining content as almost anything: documents, audio, video, texts, pictures, phone numbers, articles etc.

### 4.3.1 Content Authoring

Content authoring refers to the process of creating content. Content can be created by fetching content from the different available sources (government entities, third party, etc.). Content authoring is done through an authoring tool.

Content authoring tool should have following features -

- Authoring tools should support the creative effort of authors by providing templates, images, layouts, etc. Content authors should be able to create a unique content resource either by linking and uploading documents (in PDF) or keying in text to create content resource. Should support creation of templates for content creation and enable authors to select input content from different sources.

- Tools should have built in agents to pull content from different sources including content feeds and present the same to authors in required formats. For this purpose, authors should be able to configure content resources and the frequency at which the content from the resource should be pulled. Authors should also be able to specify template for a given type of content.
- Authoring tools should be integrated with the content repositories to enable authors to choose from available content and create new content. Authoring tool should be able to produce output (content resources) in different formats namely HTML, XML, PDF. Authoring tools should support spell check and language correction options.
- Authoring tools should be integrated with metadata management tools so that content authors can attach metadata to the content they author.
- Content creators need ways to provide alternate versions of media resources for use by different kinds of device and delivery context, while maintaining the same information semantics.
- Content feeds should be handled using XML and RSS technologies

### **4.3.2 Content Publishing**

Authored content will be staged in the CMS before it is released for delivery. Authored content will be routed through various stages (modification, approval, moderation, and publishing) of workflow and finally will get published into content repository. CMS should support creating and configuring workflows based on categories of content. Metadata of the content may get modified through the workflow. Content that is approved to be published should be released into content repository only after making sure that all the mandatory metadata is created for a piece of a content.

### **4.3.3 Content Delivery**

The content used on Central Agricultural Portal will include text, graphics, and images, audio and video resources. Content delivery refers to aggregating content in a structured format from content repositories and displaying the same to the end user. Content delivery component of CMS should have following features –

- Content delivery component of CMS should have capabilities to pick up content as available in the content repositories, structure the information for presentation and associate default style and display the information for usage.

- Content delivery should have specific templates for each component of content categories. It should have repository of styles and should be able to create and modify styles.
- It should manage content validity and presentation. It should be able to set up "content review, exit and archival" policies in the content delivery component of CMS. It should have notification capabilities so that notifications and alerts can be set up. Content delivery should send notifications /reminders/ alerts based on the policies that are set up.

#### **4.3.4 Content Storage Management**

Central Agricultural Portal handles both structured and un-structured content. Un-structured content includes web pages, documents, images, audio files, video files, RSS feeds, etc. Structured content should be stored in a Relational Database Management System (RDBMS) where as un-structured content should be managed by a content repository.

CMS should have content repositories to handle unstructured content. Content repositories should be flexible enough so that content delivery can work on multiple repositories which are using different taxonomies to deliver information as required. Content repositories should also store templates, formats, etc.

CMS should be able to store content for delivery across multiple devices (channels)

#### **4.3.5 Content Exit and Archival**

Information delivered on the Central Agricultural Portal would lose relevance beyond the validity period. Content which is found non relevant should be archived. Validity period may vary across content categories. Archived content will be stored in a repository before the same can be permanently deleted. Metadata associated with the content should be effectively used to manage content validity and further archival.

### **4.4 Content Management System – Functionality**

To manage set of activities during the content life cycle, Central Agricultural Portal will make use of Content Management System (CMS).

Expected functionality of a CMS is as given below-

#### 4.4.1 Content Taxonomy

Taxonomy is the practice of classifying content. It allows classifying and structuring content into logical groupings. It includes the conception, naming, and classification of resources. Taxonomies were developed to aid in the search for information. Taxonomy software correlates and groups unstructured information. The purposes of content taxonomies are to create, classify and discover content so that right information is found on the portal at the right time. In other words Taxonomies work as computer-generated card catalogues that allow us to locate, retrieve and cross-reference information in our digital libraries. Personalize content delivery also requires content taxonomy. Benefits of taxonomy are -

- Enhances information search by narrowing search results using taxonomy facets.
- Enable users to categorize content for automated placement within the site information architecture.
- Avoiding duplicate efforts
- Provide overview as well as details about a subject
- Demonstrate relationships
- Reduce complexity

Central Agricultural Portal will be the repository of large amount of information in various formats- structured, unstructured and on various topics at various places, having large number and various types of sources. Though it is desirable to have vast amount of information on the Central Agricultural Portal for the benefit of the user, it should not face the problem of “Info glut” making it difficult to find information user desires. Hence it is necessary to correlate, categorize, analyze and act on this information so that it is easily available to the users. Central Agricultural Portal needs to provide intuitive navigation and easy discovery of information, which require better means of resource description. Content taxonomies are good methodologies to achieve better resource description. Taxonomies provide a means for categorizing or classifying information within a reasonably well-defined associative structure, in which each term in taxonomy is in one or more parent/child (broader/narrower) relationships to other terms in the taxonomy.

A well logically organized and grouped content will lead to easy trace, navigation and faster access to desired information. The information on the Central Agricultural Portal has to be well classified into distinct modules, which are to be interlinked at relevant places to provide the user with a holistic view.

Content displayed on Central Agricultural Portal includes data from relational databases, documents, digital assets, XML, web pages, web services, discussion groups, etc. By tagging such resources with relevant terms from the taxonomy, we enable search and retrieval of those information assets, thereby, making users to reach the content they need in a fast manner.

Separate taxonomies should be maintained for each type of content. For example content repository for application forms, Content repository for GAPS and PoPs, Content repository for schemes, content repository for policies, etc.

All data elements will be identified. For generic data elements unique reference numbers assigned by eGovernance Standards Division of NIC will be used. For domain specific data elements unique reference numbers defined by Domain MDDS Committee will be used.

#### **4.4.2 Content Meta Data**

Meta data is information about the content. Metadata comprises of various attributes or items describing any content entity. On the basis of these attributes, information can be easily retrieved while searching. When a document is created the author is prompted to list the creation date, title, subject, matter, synopsis and a few keywords.

Any resource used as a part of Central Agricultural Portal should have metadata. This metadata can be based on the elements of the Dublin Core as defined in the Dublin Core Metadata Element Set, Version 1.1. The Dublin Core Metadata Element Set is a vocabulary of fifteen properties used in resource description. These 15 properties have been described below:

	<b>Element</b>	<b>Description</b>
1	Title	A name given to the resource. Title will be a name by which the resource is formally known.
2	Creator	An entity primarily responsible for making the content of the resource. Examples of a Creator include a person, an organization, or a service. Typically, the name of a Creator should be used to indicate the entity.
3	Subject	The topic of the content of the resource. Typically, the subject will be represented using keywords, key phrases, or classification codes. Recommended best practice is to use a controlled vocabulary.
4	Description	An account of the content of the resource. Description may include but is not limited to: an abstract, a table of contents, a graphical representation, or a free-text account of the resource
5	Publisher	An entity responsible for making the resource available. Examples of a Publisher include a person, an organization, or a service. Typically, the name of a Publisher should be used to indicate the entity.
6	Contributor	An entity responsible for making contributions to the content of the resource. Examples of a Contributor include a person, an organization, or a

		service. Typically, the name of a Contributor should be used to indicate the entity
7	Date	A date associated with an event in the life cycle of the resource.
8	Type	The nature or genre of the content of the resource.
9	Format	The physical or digital manifestation of the resource. The file format, physical medium, or dimensions of the resource.
10	Identifier	An unambiguous reference to the resource within a given context. Recommended best practice is to identify the resource by means of a string conforming to a formal identification system
11	Source	A reference to a resource from which the present resource is derived. Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system.
12	Language	A language of the intellectual content of the resource
13	Relation	A reference to a related resource. Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system.
14	Coverage	The extent or scope of the content of the resource. The spatial or temporal topic of the resource, the spatial applicability of the resource, or the jurisdiction under which the resource is relevant Spatial topic and spatial applicability may be a named place or a location specified by its geographic coordinates. Temporal topic may be a named period, date, or date range. A jurisdiction may be a named administrative entity or a geographic place to which the resource applies. Where appropriate, named places or time periods can be used in preference to numeric identifiers such as sets of coordinates or date ranges.
15	Rights	Information about rights held in and over the resource. Typically, rights information includes a statement about various property rights associated with the resource, including intellectual property rights.

The fifteen elements "Dublin Core" described here are part of a larger set of metadata vocabularies and technical specifications maintained by the Dublin Core Metadata Initiative (DCMI).

Information using the Dublin Core elements may be represented in any suitable language (e.g., in HTML Meta elements). However, RDF is an ideal representation for Dublin Core information.

The general attributes for any type of content that would be specified while storing the content for Central Agricultural Portal in addition to above are –

- Short Title
- Concerned Central Ministry / State
- Concerned Department
- Classification
- Category
- Version
- Date of last modification
- Validity period (Date of expiry/Valid up to)(dd/mm/yyyy)

Central Agricultural Portal is required to comply with defined standard for content taxonomy, metadata and master data.

Metadata is classified into mandatory, optional and extended. All content eligible for publishing and in the content repository should have mandatory metadata. Optional metadata enhances the discoverability of content. Extended metadata can be used by Central Agricultural Portal to manage content within the context of the particular department / division / Directorate. Metadata should be used for both structured as well as un-structured data.

Every resource (content) in the repository whether published or un-published should have associated metadata and this metadata should be complete in terms of the mandatory elements. Content repository should contain the content along with its metadata file.

Metadata capture should start from the content source itself. Workflow (Authoring, Publishing and Archival) should be integrated with metadata management so that required metadata can be captured along with the workflow.

Metadata should make use of terms defined in the taxonomy only so that restricted vocabularies are used.

Metadata should be managed using XML. Metadata and taxonomies should be in Unicode. Once the content is classified and organized, content that can be managed using XML should be made structured. Government Services will have contact details. Instead of embedding the contact details with the services description content resource, contact details can be handled as a structured data. This also avoids putting the entire content on workflow if there is a change only in the contact details. Presentation can compose information by stitching the unstructured data

"Service Description" and structured data "Contact details" which is in XML format. "Contact directory" can be XML based and be treated as structured content.

Metadata should be effectively used to manage content life cycle also by including extended metadata elements like "expiry date", "next review due on", etc.

#### **4.4.3 Formats for Content**

To make information searchable, similar type of content should have uniform standardized formats. For example, all Schemes should have Title, Funding pattern, Brief Description, Beneficiaries, Eligibility criteria, etc.

Formats for Good Agricultural Practices (GAPs) and Package of Practices (PoP) would be included in Software Requirement Specifications of “Service 3: Information on crops, farm machinery, training and Good Agricultural Practices (GAPs)”. Formats for content identified under each of the 12 service clusters will be included in Software Requirement Specifications for that particular service.

Based on the Central Agricultural Portal taxonomy, it should have established formats for each part of the content displayed on the portal. Content formats that can be considered are textual content, graphical content, applications, widgets, audio and video content, tickers, tabular format, downloadable documents. Based on the assessment of the user needs and concerns and constraints on the content, each section or group of content at a minimum should have a primary format and a secondary format. In essence, each content component should have alternate formats for delivery. Primary format will be first choice for content delivery where as secondary format can be used when data in primary format cannot be made available. Also Central Agricultural Portal should establish acceptable file formats for each content format.

Content can have differences between formats at source, storage format, delivery formats. At a minimum, following issues should be taken in consideration when deciding formats

##### **Content delivery formats**

- a. Minimum user interface capabilities
- b. Size of the content (in kbs) vis-a-vis the general bandwidth availability of users
- c. Usability of the content - readability, printability
- d. Type of content - static, relatively static or dynamic

##### **Content Storage formats**

- a. Reduce the size in storage (in Kbs)
- b. Transformability of content between storage and delivery formats

- c. Enhanced discoverability of the content by external entities like State Agricultural portals, other departmental portals, portals in agricultural sector, other State Portals, etc

Example Content	Source format	Storage format	Primary Delivery format	Secondary delivery format
AGMARKNET Yatra	Audio	Audio	Audio	Speech transcript
Market price trends	Tabular or records	records in database	Graphical	Tabular
RKVY scheme details	Text	Text	Text	Downloadable document
Future and spot prices	Content feed	No need to store	Same as source format	Text
Application for Registration of pesticide	Form	Form	Editable forms	Downloadable document

## 4.5 Content Contribution Sources

The Central Agricultural Portal will be a huge repository of agricultural related information. The content will be generated at various levels, at various places. The following table indicates the content types, content contribution sources and service levels expected for content generation and processing as defined in DPR of the project.

### 4.5.1 Central Agricultural Portal Content Contributors

Classification	Stakeholder
Central Level	Divisions of Department of Agriculture & Cooperation (DAC) Directorate of Extension Directorate of Marketing & Inspection (DMI) Directorate of Plant Protection, Quarantine & Storage (DPPQS) National Seeds Corporation (NSC) Central Insecticides Board & Registration Committee (CIBRC) Regional Plant Protection & Quarantine Station (RPPQS) Central Insecticides Laboratory (CIL)

Classification	Stakeholder
	Central Fertilizer Quality Control & Training Institute (CFQCTI) National Centre for Organic Farming (NCOF) State Farm Corporation of India (SFCI) National Seed Association of India (NSAI) National Institute of Agriculture Extension & Management (MANAGE) Fisheries Division, Department of Dairy and Animal Husbandry Indian Meteorological Department (IMD) Food Corporation of India (FCI) Jute Corporation of India Cotton Corporation of India Indian Council for Agricultural Research (ICAR) National Informatics Centre (NIC) Kisan Call Centre
<b>State Level</b>	Divisions of State Department of Agriculture Central Integrated Pest Management Centres (CIPMC) Locust Warning Organization (LWO) State Seeds Corporation State Seeds Certification Agency State Indian Meteorological Department Agro-Meteorological Forecasting Unit (AMFU) State Warehouse Corporation State Agriculture University (SAU) Krishi Vigyan Kendra (KVK) Extension Education Institutes Regulated Marketing Committees (RMC) State Agricultural Marketing Boards (SAMB) Directorate of Fisheries State Call Centres Soil Testing Laboratories Pesticide Testing Laboratories Fertilizer Testing Laboratories Seed Testing Laboratories
<b>Others</b>	Multi Commodity Exchange of India National Commodity & Derivates Exchange Limited Private Sector Manufacturers, Wholesalers & Dealers Importers and exporters of agriculture produce Traders and Buyers Agri Business Clinics & Centres

## 4.5.2 Content Management – Roles & Responsibilities

### 4.5.2.1 Central Level Agencies

S.No.	Component	Agencies
1	Good Agriculture Practices	<ul style="list-style-type: none"> <li>○ Divisions of Department of Agriculture &amp; Cooperation (DAC)</li> <li>○ Directorate of Extension</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Central Fertilizer Quality Control &amp; Training Institute (CFQCTI)</li> <li>○ National Centre for Organic Farming (NCOF)</li> <li>○ Food Corporation of India (FCI)</li> <li>○ Jute Corporation of India</li> <li>○ Cotton Corporation of India</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>
2	Package of Practices	<ul style="list-style-type: none"> <li>○ Divisions of Department of Agriculture &amp; Cooperation (DAC)</li> <li>○ Directorate of Extension</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>
3	Quality Control and Assurance Data	<ul style="list-style-type: none"> <li>○ Divisions of Department of Agriculture &amp; Cooperation (DAC)</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Central Insecticides Board &amp; Registration Committee (CIBRC)</li> <li>○ Regional Plant Protection &amp; Quarantine Station (RPPQS)</li> <li>○ Central Insecticides Laboratory (CIL)</li> <li>○ National Seed Association of India (NSAI)</li> <li>○ National Seeds Corporation (NSC)</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>
4	Compliance data	<ul style="list-style-type: none"> <li>○ Directorate of Marketing &amp; Inspection (DMI)</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Central Insecticides Board &amp; Registration Committee (CIBRC)</li> <li>○ Regional Plant Protection &amp; Quarantine Station (RPPQS)</li> <li>○ Central Insecticides Laboratory (CIL)</li> </ul>
5	Information on seed varieties	<ul style="list-style-type: none"> <li>○ Seeds Division of Department of Agriculture &amp; Cooperation (DAC)</li> <li>○ National Seeds Corporation (NSC)</li> <li>○ National Seed Association of India (NSAI)</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>
6	Information on organic farming practices	<ul style="list-style-type: none"> <li>○ INM Division of Department of Agriculture &amp; Cooperation (DAC)</li> <li>○ Central Fertilizer Quality Control &amp; Training Institute (CFQCTI)</li> <li>○ National Centre for Organic Farming (NCOF)</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>

S.No.	Component	Agencies
7	Information on crop diseases	<ul style="list-style-type: none"> <li>○ Plant Protection Division of Department of Agriculture &amp; Cooperation</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Regional Plant Protection &amp; Quarantine Station (RPPQS)</li> <li>○ Central Insecticides Laboratory (CIL)</li> </ul>
8	Info on pest prevention & cure methods	<ul style="list-style-type: none"> <li>○ Plant Protection Division of Department of Agriculture &amp; Cooperation</li> <li>○ Directorate of Plant Protection, Quarantine &amp; Storage (DPPQS)</li> <li>○ Regional Plant Protection &amp; Quarantine Station (RPPQS)</li> <li>○ Central Insecticides Laboratory (CIL)</li> </ul>
9	Information on Agro-Met advisories	<ul style="list-style-type: none"> <li>○ ESA Division (Agro-Met) of Department of Agriculture &amp; Cooperation</li> <li>○ Indian Meteorological Department (IMD)</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> </ul>
10	Training Toolkits for farmers and trainers	<ul style="list-style-type: none"> <li>○ Extension Division of Department of Agriculture &amp; Cooperation</li> <li>○ Directorate of Extension</li> <li>○ Indian Council for Agricultural Research (ICAR)</li> <li>○ Central Fertilizer Quality Control &amp; Training Institute (CFQCTI)</li> <li>○ National Centre for Organic Farming (NCOF)</li> <li>○ National Institute of Agriculture Extension &amp; Management (MANAGE)</li> </ul>
11	Best practices on fishery inputs	<ul style="list-style-type: none"> <li>○ Fisheries Division, Department of Dairy and Animal Husbandry</li> </ul>
12	Expert advices	<ul style="list-style-type: none"> <li>○ Indian Council for Agricultural Research (ICAR)</li> <li>○ Kisan Call Centre</li> </ul>

#### 4.5.2.2 State Level Agencies

S.No.	Component	Agencies
1	Good Agriculture Practices	<ul style="list-style-type: none"> <li>○ Divisions of State Department of Agriculture</li> <li>○ State Agriculture University (SAU)</li> <li>○ Krishi Vigyan Kendra (KVK)</li> <li>○ Extension Education Institutes</li> </ul>
2	Package of	<ul style="list-style-type: none"> <li>○ Divisions of State Department of Agriculture</li> <li>○ State Agriculture University (SAU)</li> </ul>

	Practices	<ul style="list-style-type: none"> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Extension Education Institutes</li> <li><input type="radio"/> Zonal Research and Extension Advisory Committee (ZREAC)</li> </ul>
3	Quality Control and Assurance Data	<ul style="list-style-type: none"> <li><input type="radio"/> Plant Protection Division of State Department of Agriculture</li> <li><input type="radio"/> Central Integrated Pest Management Centres (CIPMC)</li> <li><input type="radio"/> State Seeds Certification Agency</li> <li><input type="radio"/> Soil Testing Laboratories</li> <li><input type="radio"/> Pesticide Testing Laboratories</li> <li><input type="radio"/> Fertilizer Testing Laboratories</li> <li><input type="radio"/> Seed Testing Laboratories</li> </ul>
4	Compliance data	<ul style="list-style-type: none"> <li><input type="radio"/> Central Integrated Pest Management Centres (CIPMC)</li> <li><input type="radio"/> Locust Warning Organization (LWO)</li> <li><input type="radio"/> Agro-Meteorological Forecasting Unit (AMFU)</li> <li><input type="radio"/> State Seeds Certification Agency</li> <li><input type="radio"/> Regulated Marketing Committees (RMC)</li> </ul>
5	Information on seed varieties	<ul style="list-style-type: none"> <li><input type="radio"/> Seed Division of State Department of Agriculture</li> <li><input type="radio"/> State Seeds Corporation</li> <li><input type="radio"/> State Seeds Certification Agency</li> </ul>
6	Information on organic farming practices	<ul style="list-style-type: none"> <li><input type="radio"/> INM Division of State Department of Agriculture</li> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Extension Education Institutes</li> </ul>
7	Information on crop diseases	<ul style="list-style-type: none"> <li><input type="radio"/> PP Division of State Department of Agriculture</li> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Central Integrated Pest Management Centres (CIPMC)</li> </ul>
8	Info on pest prevention & cure methods	<ul style="list-style-type: none"> <li><input type="radio"/> PP Division of State Department of Agriculture</li> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Central Integrated Pest Management Centres (CIPMC)</li> </ul>
9	Information on Agro-Met advisories	<ul style="list-style-type: none"> <li><input type="radio"/> State Indian Meteorological Department</li> <li><input type="radio"/> Agro-Meteorological Forecasting Unit (AMFU)</li> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> </ul>
10	Training Toolkits for farmers and	<ul style="list-style-type: none"> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Extension Education Institutes</li> </ul>

	trainers	<ul style="list-style-type: none"> <li><input type="radio"/> Extension Division of State Department of Agriculture</li> </ul>
11	Best practices on fishery inputs	<ul style="list-style-type: none"> <li><input type="radio"/> Directorate of Fisheries</li> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> </ul>
12	Expert advices	<ul style="list-style-type: none"> <li><input type="radio"/> State Agriculture University (SAU)</li> <li><input type="radio"/> Krishi Vigyan Kendra (KVK)</li> <li><input type="radio"/> Extension Education Institutes</li> <li><input type="radio"/> State Call Centres</li> </ul>

## 4.6 Content Categories

Any content to be updated on the portal is to be categorized in different categories for easily locate it using different search criteria. Categories in which contents can be classified have been listed in the following sections -

### 4.6.1 Content categories based on sectors

- Pesticides
- Fertilizers
- Seeds
- Soil Health
- Crops - Cereals, Pulses, etc. Wheat, Rice etc.
- Farm machinery
- Extension
- Forecasted weather and agro-met advisory
- Marketing
- Procurement
- Exports and imports
- Marketing infrastructure
- Irrigation infrastructure
- Drought Relief and Management
- Fisheries
- Livestock Management
- Credit

## 4.6.2 Content categories based on intended User Groups

- Farmers and Farmers' group
- Traders – dealers, wholesalers, retailers, exporters, importers
- Government
- Research Scholars, students

## 4.6.3 Content categories based on locations

- Content specific to particular Agro-climatic zone
- Content specific to particular State
- Content specific to particular District

## 4.6.4 Content Categories based on format of the content

- Textual
- Audio
- Video
- Graphics ( Images, Photos, graphs, banners, maps)

Digitization requirements for content generation in various standardized formats have been discussed in Chapter 16 “Digitisation Requirements” in detail.

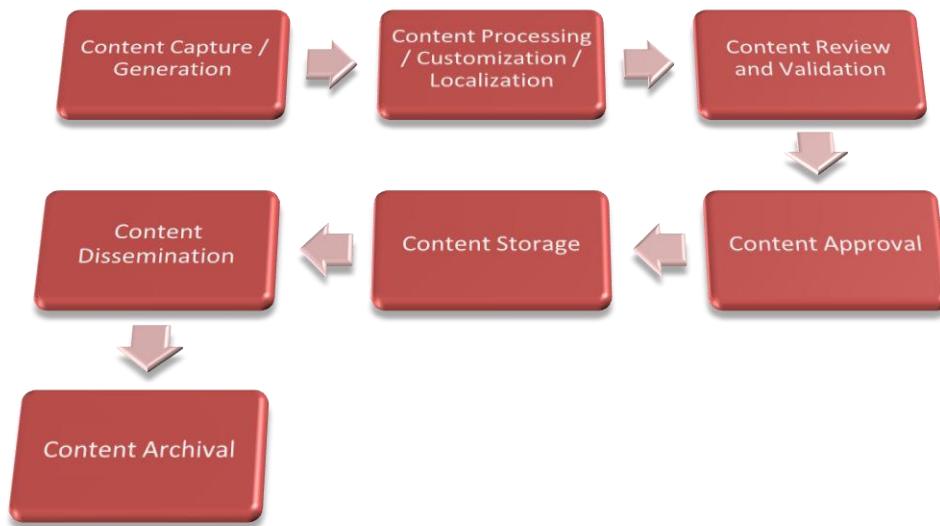
## 4.6.5 Generic Content Categories

- Good Agricultural Practices (GAPs)
- Package of Practices (PoPs)
- Alerts
- Frequently Asked Questions (FAQ)
- News
- Profiles – commodity, Regional profiles
- Media Gallery
- Programmes and Schemes
- Acts and Rules
- Documents and Reports – Plans, Annual Reports, Gazettes, Guidelines, Standards, Policies, budget documents, Census Reports, Surveys, Statistical reports, etc.
- Forms (online and offline)
- Directories

- Services
- Circulars and Notifications
- Tenders
- Announcements
- Events (Trainings, workshops, seminars, demonstrations)

## 4.7 Content Life Cycle

1. Content Capture / Generation
2. Content Processing / Customization / Localization
3. Content Review and Validation
4. Content Approval
5. Content Storage
6. Content Dissemination
7. Content Archival



**Figure - 34: Content Life Cycle**

Content undergoes different phases in its lifecycle such as authoring, publishing, archival etc. Each of the phases of the content life cycle needs to be supported by policies, tools, processes and/or procedures. Central agricultural Portal should define content policies and processes.

## 4.8 Content Validity

The validity of the content will be based on the following norms:

Validity Up to field has to be specified for each content object.

For perpetual content i.e. content which does not expire, contributor should be allowed to specify validity date as 10 years since the content contribution date. Only content like announcements will not be displayed on the portal after the expiry of the validity date. It is proposed to develop Reminder Module if so required with the following functionality.

The Reminder can be issued as SMS alerts or email notifications. These will be automatically triggered once an update is received.

1st Reminder will be issued to the content contributor along with the content two weeks prior to the validity date.

2nd reminder is sent along with the content 1 week prior to the validity date and then two days before the valid up to date the final moderator to take the decision whether to show the content on portal or not.

## 4.9 Content Management - Functional Requirement Specifications (FRS)

### 4.9.1 Content Management (CM)

#### Module: Content Management

**Objective:** It is envisaged that after implementation of the proposed solution, large quantities of content would be fed into the proposed solution for other applications, as well as the base portal to disseminate information. In order to facilitate the same, the proposed content management module is planned to provide interface to these users to upload, download, review, edit and delete the content from the system. A simplistic example of the information that is proposed to be disseminated through the system is the Good Agricultural Practices and Package of Practices on different crops. These would be generated at different levels by the ICAR, SAUs and KVKs; this information would be managed by the proposed content management system to provide meaningful results to the farmers and the private sector.

#### Functionalities:

CM-FR1. The system shall allow the user to enter the content in the prescribed format

- CM-FR2. The system shall allow the user to create a document tree of the content added
- CM-FR3. The system shall allow the user to edit the content fields
- CM-FR4. The system shall allow users to upload files with the content added
- CM-FR5. The system shall allow the user to add pictures / graphics with the content added
- CM-FR6. The system shall allow the user to save the content added temporarily before submitting into the Knowledge Management Application.
- CM-FR7. The system shall allow the user to retrieve the submitted content
- CM-FR8. The system shall allow the user to edit the submitted content
- CM-FR9. The system shall allow the user to delete submitted content
- CM-FR10. The system shall prompt the user in case the word limit has been exceeded
- CM-FR11. The system shall prompt the user in case the content has not been submitted
- CM-FR12. The system shall prompt the user in case the content has not been saved
- CM-FR13. The system shall prompt the user in case deletion has not happened
- CM-FR14. The system shall acknowledge the use when the content successfully uploaded

<b>Input Format</b>	<b>Description</b>
<b>Data Entry</b>	As per the prescribed format
<b>Document Upload</b>	As per the prescribed format, not to exceed 15 MB
<b>Image Upload</b>	As per the prescribed format, not to exceed 2 MB
<b>Output Format</b>	<b>Description</b>
<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful edition</b>	Acknowledgement of successful edition
<b>Unsuccessful edition</b>	Reason for unsuccessful edition
<b>Successful deletion</b>	Acknowledgement of successful deletion
<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Technical error</b>	Reason for technical error

## 4.9.2 Document Management (DM)

<b>Module: Document Management</b>	
<p><b>Objective:</b> During the process of collection, customization, localization, personalization and dissemination of information it may be required to use digital documents. These documents are envisaged to be handled by the document management module through functionalities including document upload and download, document review, edit and deletion of documentation.</p>	
<p><b>Functionalities:</b></p>	
DM-FR1. The system shall allow the user to attach digital document	
DM-FR2. The system shall allow the user to upload the attached digital document	
DM-FR3. The system shall allow the user to delete digital documents	
DM-FR4. The system shall allow the user to view the digital documents that have been uploaded	
DM-FR5. The system shall allow the user to tag the digital documents to the content	
Input Format	Description
<b>Digital Document</b>	As per the prescribed format, not to exceed 15MB
Output Format	Description
<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful deletion</b>	Acknowledgement of successful deletion
<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Technical error</b>	Reason for technical error

## 4.9.3 Meta-Data Management (MDM)

<b>Module: Meta – Data Management</b>	
<p><b>Objective:</b> Defined simplistically, meta-data is data about data. Therefore to classify and identify incoming and outgoing data into consumable portions, it would be required to systematically design the application that is able to compartmentalize this information under appropriate heads. The proposed meta-data management module would provide functionalities of creation of categories of data, their editing and deletion and creation of meta-data schemas, which would facilitate the same for the system and information seekers.</p>	

**Functionalities:**

- MDM-FR1. The system shall allow the user to preset the meta-data classes
- MDM-FR2. The system shall allow the user to edit the meta-data classes
- MDM-FR3. The system shall allow the user to delete the meta-data classes
- MDM-FR4. The system shall allow the user to create a meta-data tree
- MDM-FR5. The system shall allow the user to save the meta-data classes created
- MDM-FR6. The system shall prompt the user in case the meta-data classes have not been saved
- MDM-FR7. The system shall allow the user to delete the meta-data classes from the meta-data tree

Input Format	Description
<b>Meta Data Fields</b>	As per the FAO classifications <sup>1</sup> for agriculture related content and as per the prescribed format from the state division
<b>Output Format</b>	Description

<sup>1</sup> **AGRIS** (International System for Agricultural Science and Technology) is a global public domain Database with 2.6 million structured bibliographical records on agricultural science and technology. The Database is maintained by FAO, and its content is provided by more than 150 participating institutions from 65 countries. The AGRIS Search system, accessible at <http://agris.fao.org>, allows scientists, researchers and students to perform sophisticated searches using keywords from the AGROVOC thesaurus, specific journal titles or names of countries, institutions, and authors.

AGROVOC is the corporate thesaurus of the Food and Agriculture Organization of the United Nations (FAO). It covers topics related to the interest of FAO, including agriculture, forestry, fisheries, environment and related domains. (<http://aims.fao.org/standards/agrovoc/functionalities/search>)

The traditional AGROVOC Thesaurus is made up of terms, connected by hierarchical and non-hierarchical relations. The relations used are the classical relations used in thesauri: BT (broader term), NT (narrower term), RT (related term), UF (non-descriptor).

AGROVOC is accessible via web services, which can be called from any client application. The web services can be invoked via standard SOAP calls, returning a standard SOAP response. Using web services, changes on the AGROVOC Concept Server can be accessed immediately, reducing the time and effort necessary to download and incorporate the latest version of the AGROVOC Concept Server data into applications.

<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful edition</b>	Acknowledgement of successful edition
<b>Unsuccessful edition</b>	Reason for unsuccessful edition
<b>Successful deletion</b>	Acknowledgement of successful deletion
<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Technical error</b>	Reason for technical error

#### 4.9.4 Audio – Video Management (AVM)

##### Module: Audio – Video Management

**Objective:** In the proposed scenario it is envisaged that audio and video files would also form a part of the information that is provided to the farmers and external information seekers, in addition to the digital documents. The audio / video management module is planned to provide functionalities for upload, download and deletion of these files from the system. It would primarily be accessed by the state government departments and the academic institutes in the service delivery.

##### Functionalities:

- AVM-FR1. The system shall allow the user to attach audio-video file
- AVM-FR2. The system shall allow the user to upload the attached file
- AVM-FR3. The system shall allow the user to delete the attached file
- AVM-FR4. The system shall allow the user to set the length of the clip
- AVM-FR5. The system shall allow the user to tag the attached file to other files

Input Format	Description
<b>Audio – Video File</b>	As per the prescribed format, not to exceed 20MB
Output Format	Description
<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful deletion</b>	Acknowledgement of successful deletion

<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Technical error</b>	Reason for technical error

## 4.9.5 Content Search (CS)

### Module: Content Search

**Objective:** Three keywords that are continuously used synonymously with Agriculture MMP are localization, customization and personalization of information. This information therefore needs to be made searchable to the individual needs and conditions of the farmers. The content search module would facilitate this by providing functionalities of selection of inputs parameters for search and content display or download.

#### Functionalities:

- CS-FR1. The system shall allow the user to enter keywords / phrases to be searched
- CS-FR2. The system shall allow the user to categorize the searched items date wise
- CS-FR3. The system shall allow the user to select a criteria based on the file type
- CS-FR4. The system shall allow the user to set the criteria based on the date of last modification
- CS-FR5. The system shall allow the user to submit request for search
- CS-FR6. The system shall allow the user to reset the request to search
- CS-FR7. The system shall search on the basis of meta-data classification as preset in the system
- CS-FR8. The system shall display the results based on the search criteria
- CS-FR9. The system shall search the relevant database for data based on the received criteria

<b>Input Format</b>	<b>Description</b>
<b>Search Criteria</b>	As per the prescribed format
<b>Output Format</b>	<b>Description</b>
<b>Search Result</b>	As per the prescribed format
<b>Successful submission</b>	Acknowledgement of successful submission of request
<b>Unsuccessful submission</b>	Reason for unsuccessful submission of request
<b>Technical error</b>	Reason for technical error

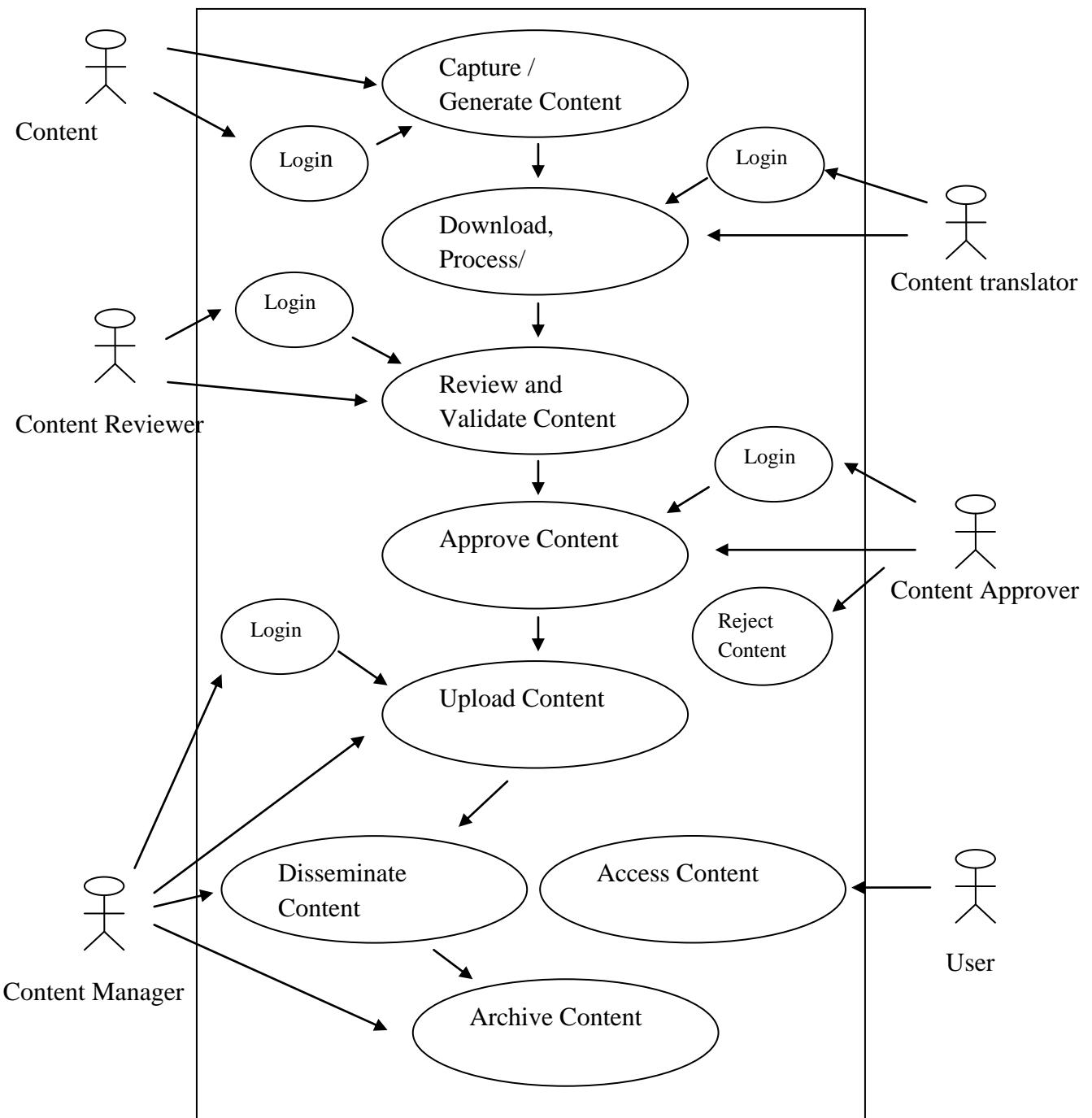
## 4.10 Content Management – Use Cases

Use Case Field	Description
<b>Use Case ID</b>	
<b>Use Case Name</b>	
<b>Primary Actor(s)</b>	<b>CAP Authorized User</b>
	This use case will allow the actor to upload the content, specify its category, sub-category and metadata depending upon the category of the content, review the content, approve it for publishing or reject, keep it pending depending on the privileges of that user.
	User has necessary privileges to upload, edit, review or approve the content
	The actor Access the URL for content updation and logs in the system
	<ol style="list-style-type: none"> <li>1) Contributor logs in. The identification details of the contributor are picked up from his profile created by him during his identity creation and necessary information is displayed on the screen.</li> <li>2) In case, he desires to change any personal details, he/she can do so by clicking “Edit My Profile” link.</li> <li>3) Contributor clicks the Knowledge Management Link.</li> <li>4) Contributor is then prompted to select the categories and sub-categories of the content and to enter the attributes of the content. (Categories – Sector, Intended User Group, Location details, Content format, General categories) (Attributes – Title, Short Title, Date of generation, Owner, Brief Description, Validity period, keywords, URL)</li> <li>5) All mandatory fields are marked with a Red Star (“*”)</li> <li>6) Contributor is then asked to browse and upload the content file.</li> <li>7) Once he uploads the content file, a unique id is generated for the content</li> </ol>

Use Case Field	Description
	<p>contributed. The content is marked as draft.</p> <p>8) Any content in draft stage can be modified or deleted by the contributor or subsequent approvers.</p> <p>9) Content Reviewer logs into the system, reviews the content. He can take the following actions</p> <ul style="list-style-type: none"> <li>a) Edit or Modify the content</li> <li>b) Accept the content</li> <li>c) Reject the content</li> <li>d) (Keep) Pending</li> <li>e) Remove the content</li> </ul> <p>10) After editing, content may be accepted. After acceptance of content, it can be sent to content approver for further action. In case content is rejected by reviewer, then it is sent back to the user who has uploaded the content. If the content is kept pending, it will continue to be displayed on the dashboard of the reviewer. Content which is accepted, rejected or removed will not be displayed on the dashboard of the reviewer under pending category.</p> <p>11) Content Approver logs into the system. He is displayed all pending contents to be approved on his dashboard.</p> <p>12) Content approver can take following actions on content</p> <ul style="list-style-type: none"> <li>a) Edit or Modify the content</li> <li>b) Accept the content</li> <li>c) Reject the content</li> <li>d) (Keep) Pending</li> <li>e) Remove the content</li> </ul> <p>13) After editing, content may be approved. In case content is rejected by reviewer, then it is sent back to the reviewer user. If the content is kept pending, it will continue to be displayed on the dashboard of the approver. Content which is accepted, rejected or removed will not be displayed on</p>

Use Case Field	Description
	<p>the dashboard of the reviewer under pending category.</p> <p>14) Once content is approved, it is marked as approved and disseminated on the web portal under specified categories and sub-categories.</p> <p>15) Approved content can be modified or deleted by approver only.</p> <p>16) After expiry of the validity period of the content, content is moved to archives.</p>
	<b>None</b>
	<p>1) The content is displayed on the Central Agricultural Portal under the specified categories and sub-categories.</p>
	<b>High</b>
	<p>1. CAP will display the fields for entering meta-data of the content depending on the categories and sub-categories of the content.</p>
	<p><b><u>Extends</u></b>  Main page of CAP.  <b><u>Is Extended By</u></b>  None.  <b><u>Uses</u></b>  Login, if the actor has logged in to the portal.</p>
	2)
	The privileges of the user are defined for each content category and sub-category.

## 4.11 Content Management – Use Case Diagram



**Figure - 35: Content Life Cycle – Use Case Diagram**

## 4.12 Content sharing workflow between CAP and SAPs

The content generated for Central Agricultural Portal, which is relevant for specific State, district, blocks can be further customized for the specific requirements of that particular state/district/block, translated at these levels and uploaded on SAPs. The following figure depicts workflow for the same.

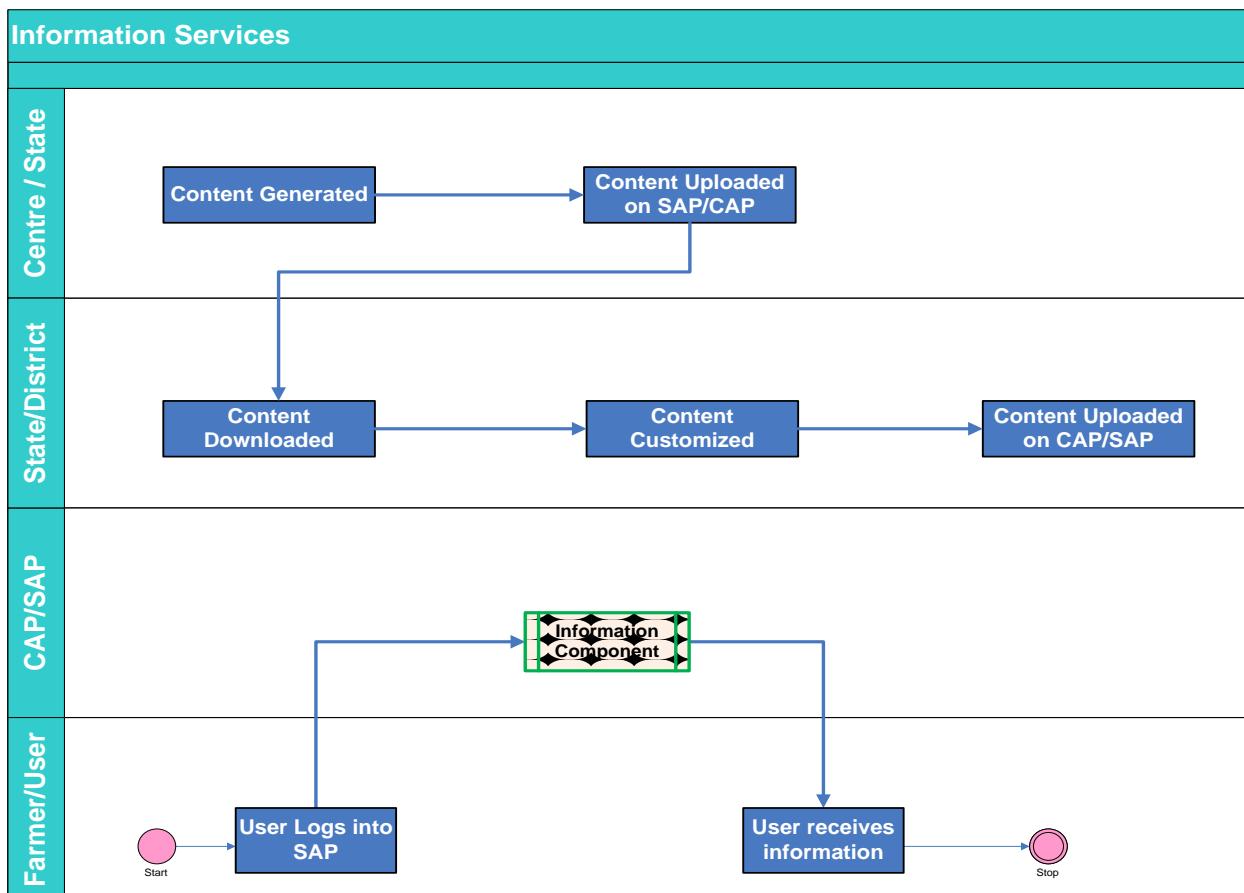


Figure - 36: Content Sharing workflow between CAP and SAPs

## 4.13 Accessing Portal Content for viewing and uploading

The Portal Content can be accessed by anyone by clicking “Knowledge Management” link provided on left side menu on Home page. To access Content Management System for Central Agricultural Portal for updation link will be provided on home as IntraAgri for internal users.

One should be able to navigate through the Central Agricultural Portal - Portal Content Home page with or without mouse and Keyboard.

It will be supported across different Operating Systems and browsers.

## 4.14 Content Management System - User Interfaces

### 4.14.1 Main Menu

The screenshot shows the main menu of the Central Agricultural Portal's Content Management System. At the top, there is a navigation bar with links to various languages (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu) and site functions (Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, Font Size). Below the navigation bar is the NeGP Agriculture logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". The main content area features a green header with "CUSTOMIZE | MY AGRI" on the left and "WELCOME 'USER NAME' | SIGN OUT" on the right. A search bar includes fields for "Title", "User Id", "State / Ministry", "Content Submitted between", and "Search". To the left of the search bar is a vertical sidebar with a list of categories: Good Agricultural Practices (GAPs), Package of Practices (POPs), Alerts, Frequently Asked Questions (FAQ), News, Commodity Profiles, Regional profiles, Media Gallery, Programs and Schemes, Acts and Regulations, Documents and Reports, Forms, Directories, Circular / Notifications, Services, Tenders, Announcements, and Events. To the right of the sidebar is a table showing submitted content entries. The table has columns for Sl. No., Title, State / Ministry, Submitted by, Date of Submission, and Action. The first six entries are listed:

Sl. No.	Title	State / Ministry	Submitted by	Date of Submission	Action
1.	Pests Prevention	DAC	JD(PO)	10/02/2012	Approve ▾
2.	Paddy-Best Practices	DAC	Dir(Extension)	05/01/2012	Pending ▾
3.	Wheat – Harvesting	ICAR	Scientist-E	08/11/2011	Pending ▾
4.	Packaging Apples	Himachal Pradesh Extension Officer	04/12/2011	Approve ▾	
5.	Cultivation of Grapes	Maharashtra Hort. Officer	06/10/2011	Approve ▾	
6.	Tea Cultivation	Assam Extension Officer	01/11/2011	Approve ▾	

At the bottom of the dashboard, there is a footer section with links to "Governance Projects" (AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA), "About this Portal", "Help", "Terms of Use", "Visitor Summary", "Newsletter", "Your Opinion!", "Related Links", "Accessibility Statement", "Directory", "Acts and Regulations", and the "NIC" logo. A note states: "The site is designed by 'National Informatics Centre, Ministry of Communications and Information Technology, Government of India'".

**Figure - 37: Content Management – Main Menu**

After login into Central Agricultural Portal and accessing the link for Content Management, the dashboard will be displayed for the user as shown in Figure 37 that will consist of

- Welcome message to the user who logged in
- Search Section – Facility for user to define criteria for searching particular type of content.

- List of actions that user can take for particular content. Only those actions will be displayed for which logged in user has privileges. For example – “Add New” link and Action column will be available only for internal users. External user will not be able to view these.
  - List of Content category and sub-categories for which user has privileges to upload the content.
  - List of content under selected category, selected status and search criteria with option to sort the list in ascending or descending order of Title, Status, Date of creation.



Hindi | Assamese | Kannada | Malyalam | Marathi | Bengali | Bodo | Dogri | English | Gujarati | Kashmiri  
 Konkani | Maithali | Manipuri | Nepali | Oriya | Punjabi | Santhali | Sindhi | Tamil | Telugu

[Site Map](#) | [Add to Favourite](#) | [Tell a Friend](#) | [RSS](#) | [Select Theme](#) ■ ■ ■ ■ ■ | [Font Size](#) A A A | 



**Department of Agriculture & cooperation**  
Ministry of Agriculture



- Good Agricultural Practices (GAPs)
- Package of Practices (POPs)
- Alerts
- Frequently Asked Questions (FAQ)
- News
- Commodity Profiles
- Regional profiles
- Media Gallery
- Programs and Schemes
- Acts and Regulations
- Documents and Reports
- Forms
- Directories
- Circular / Notifications
- Services
- Tenders
- Announcements
- Events

**Add New**

◆ Title

◆ Short Title

◆ Ministry

◆ State

◆ Department

◆ Division

◆ Sub-Category

◆ Language

◆ Description

◆ URL

◆ Keywords

◆ Valid Up to  (dd/mm/yyyy) 

**Submit** **Cancel**



**-Governance Projects :** AGMARKNET | DACNET | Agricultural Census | Seednet | Nav Krishi | RKVY | MMA

About this Portal | Help | Terms of Use | Visitor Summary | Newsletter | Your Opinion! | Related Links | Accessibility Statement | Directory | Acts and Regulations



Some demo text about this portal. Some demo text about this portal.

The site is designed by "National Informatics Centre, Ministry of Communications and Information Technology, Government of India" 

**Figure - 38: Content Management – Add New Content**

The additional parameters that will be displayed when user selects different categories from left side menu are listed below-

- a. Alerts
  - Starts on
- b. Commodity Profiles
  - Name of the commodity
- c. Regional Profiles
  - Name of the Region
  - Characteristics in Brief
- d. Media Gallery
  - Type of content (Audio, Video, Photo, Text)
  - Size of file
- e. Programs and Schemes
  - Scheme Type
  - Funding pattern
  - Beneficiaries Type (Farmer, Traders, Women, Community, Other)
  - Benefit types (Subsidy, Training, Loan, Material, Other)
- f. Acts and Regulations
  - Act Number / Year
  - Commencement Date
- g. Forms
  - Form No.
- h. Directories
  - Name
  - Phone Number
  - Address
  - e-mail
- i. Circular / Notifications
  - Commencement Date
- j. Announcements
  - Starts on
- k. Events
  - Duration – From date and End date
  - Venue
  - Organizer

#### **4.14.2      Moderation Module**

The Moderator can perform following action on the contents in the workflow i.e. content contributions to content publish.

- a. Edit or Modify
- b. Approve
- c. Reject
- d. (Keep) Pending
- f. Remove

After final approval, content will be published on the portal under the category specified.

## 5 User Management - Identity and Access Management

### 5.1 Identity and Access Management - Description

NeGP-Agriculture Mission Mode Project involves various stakeholders who will be accessing various resources of the project online. Secured access of these resources is of upmost important. At the same time users expects system to protect integrity and confidentiality of their identity information and ensure safety of their transaction. Hence NeGP-Agriculture needs a comprehensive Identity and Access Management (IAM) System that will provide secure access to its resources in integrated and secured manner and at the same protect privacy of the users.

User's identities are at the core of any operation. Anyone desires to access service needs to prove his identity. When these services are offered online, digital identities come in picture. Identities need to be managed to facilitate the right access to the right resources. Identity and Access Management of NeGP-Agriculture should provide consistent, efficient and secure method to manage identities both internally and externally.

The IAM system for NeGP-Agriculture is expected to provide the following benefits:

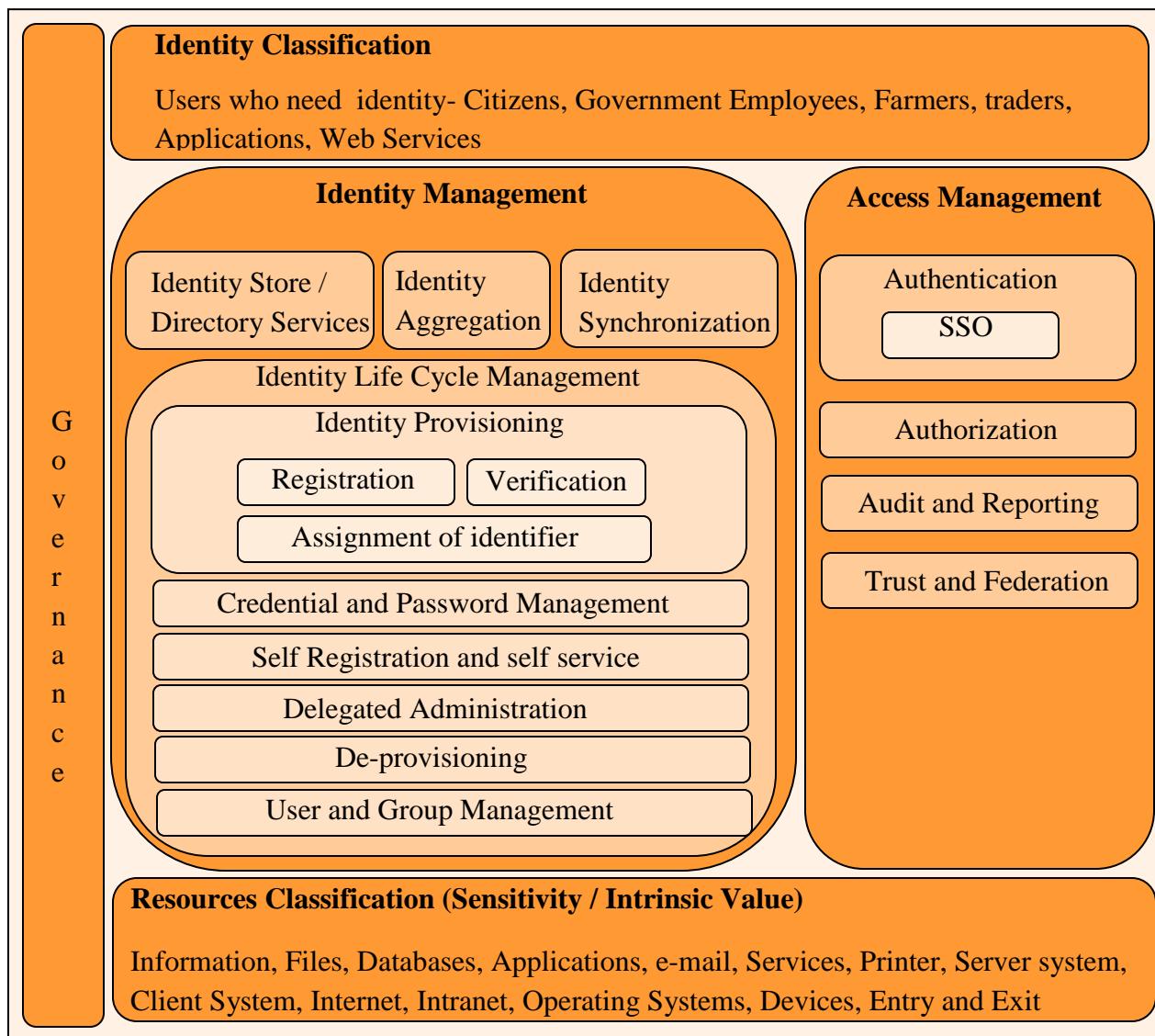
- Elimination or significant reduction in storing duplicate identities
- A single and comprehensive view of an identity
- Single Sign On Facility to the Users
- More Secured Access
- Reduction in the risk of unauthorized access to and modification or destruction of government information assets.
- Control, enforce and monitor access to resources through auditing
- Improved availability

Identity and Access Management involves

- Identity Classification
- Identity Management
- Resources Classification
- Access Management

## 5.2 Identity and Access Management – Framework

Following figures depicts framework for Identity and Access Management -



**Figure - 39: Identity and Access Management - Framework**

## 5.2.1 Identity Classification

### 5.2.1.1 Top Level Classification – Human and Technology

Identities are required for all users, including **human users** like citizens, employees, customers, divisions, departments, organizations, and **technology users** like applications, web services, devices etc. Hence at the very top level, Identities can be classified as -

- Human Users
- Technology Users

Users who need identity for NeGP-Agriculture include human users like Central and State Government Employees, Farmers, Private Sectors, etc. and Technology Users like other applications, Systems, devices, web services, etc. Identity and Access Management Module of CAP needs to create and verify credentials of the users and applications accessing resources of NeGP-Agriculture.

### 5.2.1.2 Classification based on User Categories

Following are the broad User Categories for NeGP-Agriculture Mission Mode Project -

#### 1. Farmers

1. Individual farmers
2. Farmer groups
3. Farmer cooperatives

#### 2. Central Government

1. Department of Agriculture & Cooperation
2. Attached Offices & Directorates
3. Testing Labs
4. Academic and Research Institutions

#### 3. State Government

1. Department of Agriculture & Cooperation
2. Attached Offices and Directorates
3. Testing Labs
4. Academic and Research Institutions

#### 4. Private Sector

1. Manufacturers / Wholesalers / Dealers of inputs
2. Importers and exporters of agriculture produce
3. Traders, Buyers and Commodity Exchanges

4. Call Centres, Information kiosks
5. Agri-Business Clinics and Centres

5. **Other**

1. NGOs

### **5.2.1.3 Classification – Internal and External Users**

These can be further classified as -

- Internal Users
- External Users

#### **5.2.1.3.1 Internal Users**

Internal users will consist of official from

- Central Government departments – Central level, State Level, District Level, Block Level
- State Government departments - State Level, District Level, Block Level
- ICAR Institutes
- State Agricultural Universities

#### **5.2.1.3.2 External Users**

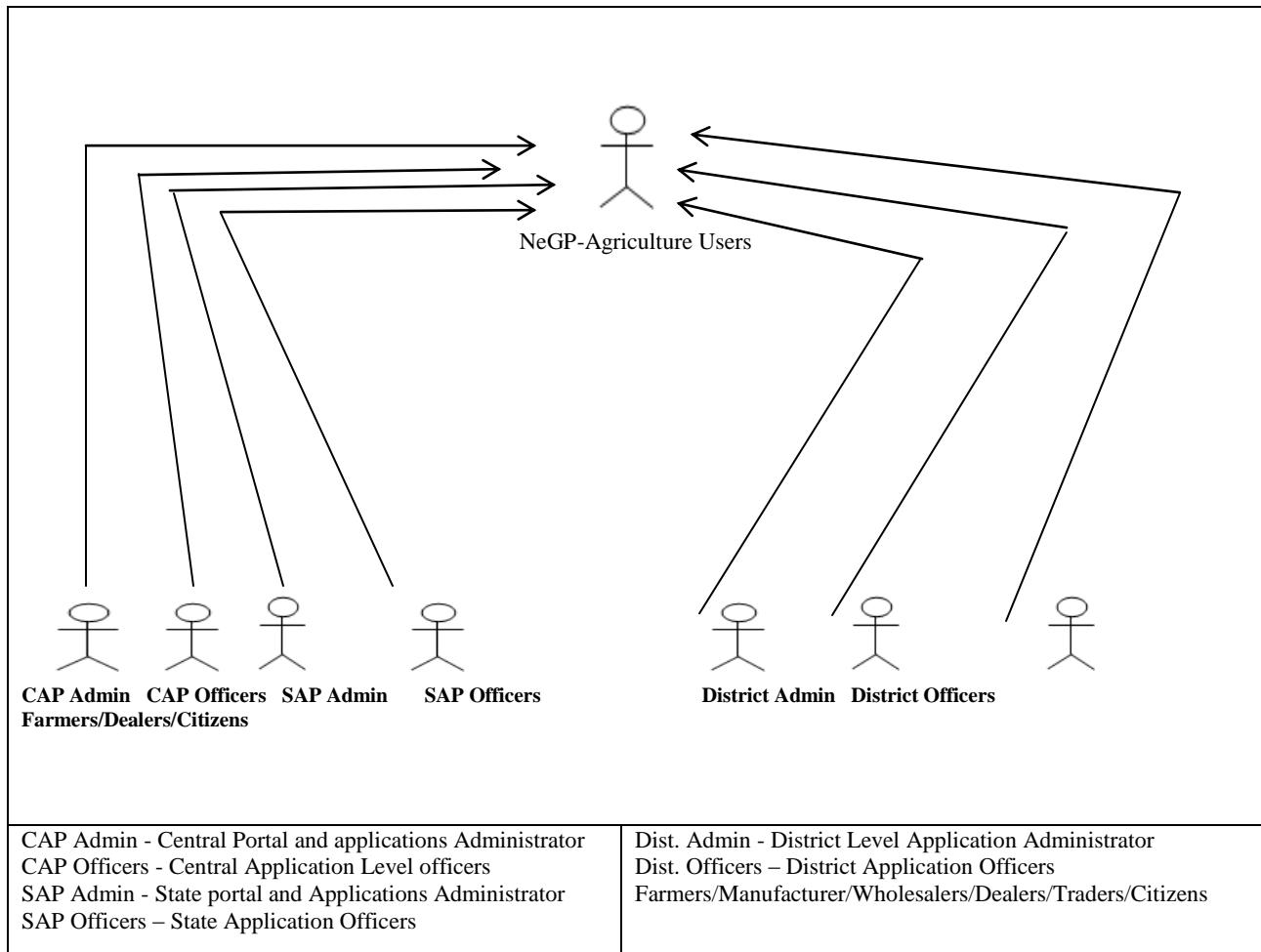
External users will consist of Farmers and users from private sectors-

- Farmers
- Dealer
- Wholesalers
- Retailers
- Exporters
- Importers

#### **5.2.1.4 Classification – based on user roles**

Users can be classified based on their role -

- Super Admin
- Admin
- Normal User



**Figure - 40: Identity and Access Management – User Classification**

### 5.2.2 Identity Management –Components

Identity Management has the following components

- Identity Store
- Identity Aggregation and Synchronization
- Identity Integration
- Identity Administration
- Provisioning / de-provisioning

#### 5.2.2.1 Identity Stores

For NeGP-Agriculture, LDAP Directory will be used to manage identities of the internal users while databases will be used for managing identities of the external users. There will be separate

database tables for storing identities for Farmers, Dealers/Wholesalers/Retailers, Traders, Exporters and Importers. Thus there will be multiple Identity Stores for NeGP-Agriculture. These will be managed by different organizations, departments, divisions and applications. These Identity Stores will be managed in distributed environment using delegation of administration.

#### **5.2.2.1.1 Owner of identities**

Identity Store should be maintained by issuer of credentials. DAC will be owner of identities in case of NeGP-Agriculture.

#### **5.2.2.2 Aggregation and Synchronization**

Though Identity and Access Management Strategy should be to consolidate the multiple identity stores into minimum number of identity stores that collectively become the standard directory services of the organization and it is always desirable to have a single identity store, it may not always possible due to the following reasons –

- regulatory requirements for information and management boundaries within organizations
- different levels of authentication needs for different resources
- different formats of entitlements for different resources

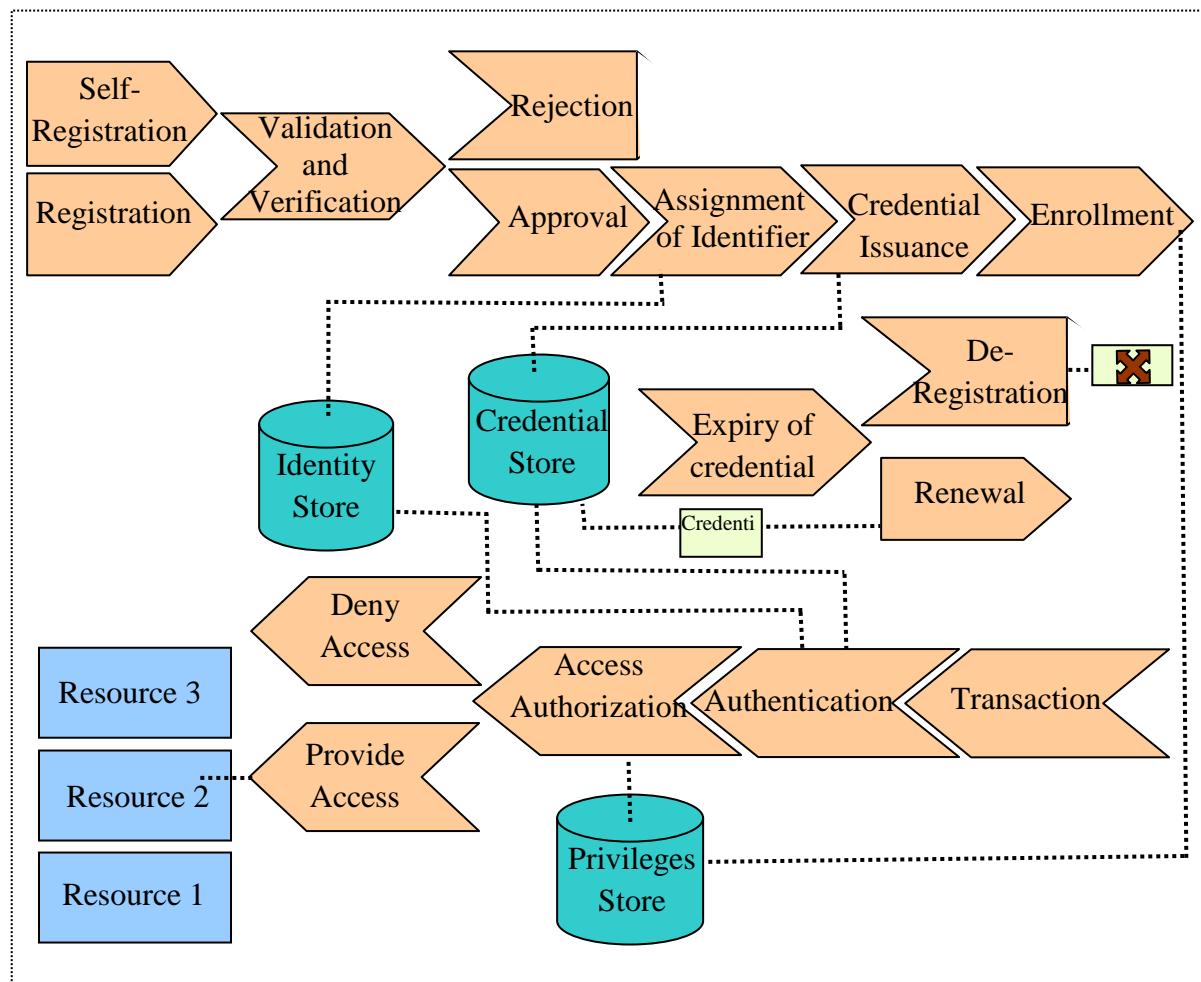
Using Integration and Synchronization techniques, integrity of these stores can be maintained.

For NeGP-Agriculture Mission Mode project it may not be possible to have a single identity store due to the above reasons. Same identity may exist in multiple identity stores in different ways with different set of attributes. Since there will be multiple Identity Stores managed by different entities, integrity of the identities in these multiple identity stores will have to be maintained by Aggregation and Synchronization of these identity stores.

The appropriate Identity Aggregations and Synchronization will be used to integrate different systems to share their identity information and create and maintain the same entitlements through common policies. Aggregation will allow linking of digital identities from multiple identity stores. It involves discovering all the managed identity stores, choosing attributes from multiple identity stores, determining the authoritative source of various attributes, creating global view of identity information and synchronizing identity information across different identity stores. It will help in providing the unified view of all digital identities and improved identity administration from a single identity store. The Identity and Management solution should be capable to handle naming convention challenges and also must have ability to map different identifiers of a single individual used in different context.

### 5.2.2.3 Identity Life Cycle Management

Identity Life Cycle Management involves Identity Provisioning (Registration, Verification, Assignment of identifier), Credential and Password Management, Self Registration and self service, Delegated Administration, De-provisioning, User and Group Management.



**Figure - 41: Identity Life Cycle Management**

#### 5.2.2.3.1 Identity Provisioning

Provisioning is the process of adding identities to an identity store. The provisioning will incorporate the following sub processes -

- User registration (Receiving User request)
- Verification
- Assignment of identifier which is unique
- Issuance of credentials
- Creation of identity in identity store

### **5.2.2.3.2 Self Registration and Self Service**

Automated provisioning and Self-service capabilities such as self-registration and changing password will be provided wherever possible to avoid administrative overhead. Mainly it will be applicable for External users.

Identity and Access Management should enforce the consistent application of policies for requesting and approving entitlements. The provisioning system should also provide audit trail that records when decisions and approvals were made and by whom.

### **5.2.2.3.3 Delegated Administration**

It will be difficult to manage all identities centrally. Hence identity management activities will be delegated at central level, state level, district level.

### **5.2.2.3.4 Identity De-Provisioning**

De-Provisioning is the process of removing identities from an identity store. Orphaned accounts can be used for unauthorized access of resources. Hence these accounts should be disabled quickly in case complete deletion of these accounts is not possible. The IAM system should not just identify the orphan accounts, but must also take corrective actions automatically. As the employee moves in the organization his access privileges change based on his change in status and job responsibilities. IAM should automatically alter the privileges to access resources depending on his new job functions and authority. In order to avoid misuse, the privileges to access NeGP-Agriculture resources should be immediately revoked in case of the death of the citizen, retirement or transfer of government employee or on expiry of the period for which privileges are granted.

### **5.2.2.3.5 Users and Group Management**

Users having particular attribute can be assigned to specific group and entitlements to access resources then can be configured for this group. Group management includes automatic and manual assignment of user accounts to and from groups as well as removal of accounts from groups.

## **5.2.3 Access Management**

Access Management involves (i) Authentication, (ii) Authorization, (iii) Auditing and reporting and (iv) Trust and Federation.

### **5.2.3.1 Authentication**

Authentication is a process of checking the credentials of an identity against the values in an identity store.

Depending upon the requirement of the level of security the weak authentication or strong authentication will be implemented. The required level of security will be determined based on the sensitivity / intrinsic value of the resource.

Various forms of authentication technologies exist today. For high security environments suitable combinations of what you know (Identity Number and/ or password), what you have (a card or token) and who are you (multiple forms of biometrics) should be used to add strength in authentication process and to increase convenience.

Of these user name and password (Plain text or cryptographically signed) and digital certificates will be used for NeGP-Agriculture wherever necessary.

#### **5.2.3.1.1 Single Sign On**

Single Sign On is the ability for a user to authenticate once with the system to access all servers, applications and data sources that user is authorized to use without need for providing credentials repeatedly. The end result is that the user only has to sign on once before using many applications.

Benefits of Single Sign On are-

- ⊕ Ability to enforce uniform enterprise authentication and/or authorization policies across the enterprise
- ⊕ End to end user audit sessions to improve security reporting and auditing
- ⊕ Removes application developers from having to understand and implement identity security in their applications
- ⊕ Usually results in significant password help desk cost savings

For NeGP-Agriculture user, Single Sign On capabilities will be provided for the accessing the resources wherever possible. Only in case of critical application or before performing particular sensitive operation, the user may be prompted to provide authentication credential again.

Single Sign On will have immediate benefits for both the users and administrators. User will be able to gain access to multiple resources with a single login saving him from multi-password confusion. It will provide greater convenience, choice and control to users. It will reduce risk of Security exposure that can occur with writing down passwords. For administrators, single sign on will simplify maintenance across servers. It will save the time and resources spent administrating passwords, unlocking accounts and dealing with lost / forgotten passwords.

## SSO – Authentication Authorization System

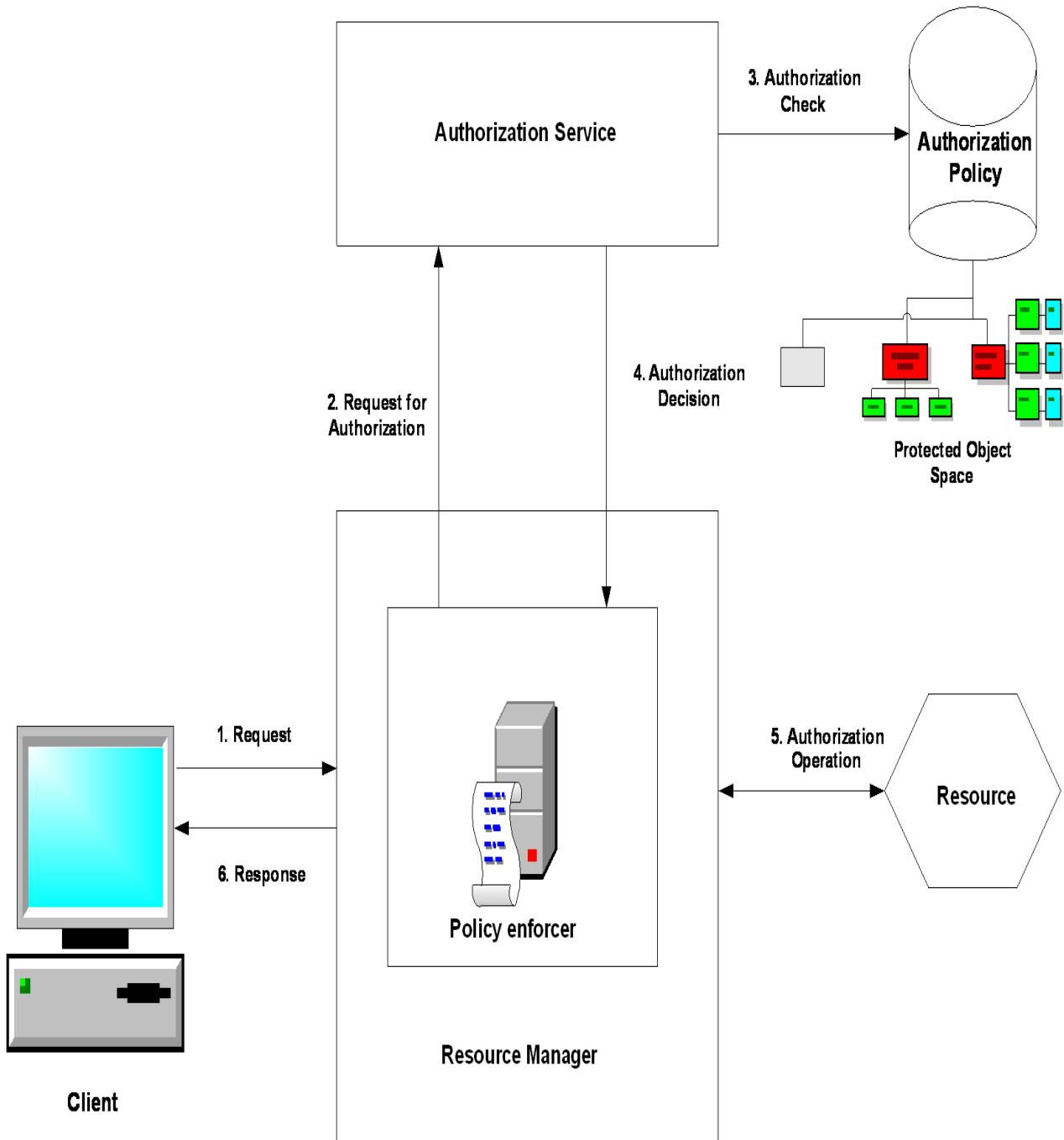


Figure - 42: Architecture of Single Sign On

### 5.2.3.2 Authorizations

Authorization is checking of authority of user to undertake the specific process or access the resource and relates to specific access permissions / privileges granted to user by resource owner. Under authorization, user's entitlements for accessing the particular resource are determined against the permissions configured on that resource. Authorization ensures that correctly authenticated entity can access only those resources for which it has been entitled.

Access policies are usually defined in terms of role, resource, operation and restriction and are defined by resource owner. The access can be role based (Manager, Administrator etc.), rule based (Membership of a group, specific rule based such as time, location etc.) or identity based. While implementing Identity and Access Management for NeGP-Agriculture, access policies will be put in place as per the requirements of the project.

With the help of Identity and Access Management, access rights will be associated with a role. Identity and Access Management should dynamically assign and automatically change access rights based on changes in user role. Access will be provided by precisely managing entitlements and modifying or terminating access rights promptly.

Authorization will be implemented through **role based access control** or through **Access Control Lists**.

#### 5.2.3.2.1 Role based access

A role will be defined as Administrator, Manager, Creator, Writer, Reader, etc. These roles will then be mapped to application permissions such as create, delete, read record / file / table / database etc. Administrator will be able to create the roles and assign permissions to these roles.

#### 5.2.3.2.2 Access Control Lists

Access Control Lists are the lists of users or groups together with permissions for each user or group. For NeGP-Agriculture, resource wise Access Control Lists will be prepared.

#### 5.2.3.3 Audit and Reporting

Security auditing is typically used to monitor for the occurrence of events, problems and security breaches. It provides a means to monitor access management events and changes to directory objects. Under NeGP-Agriculture auditable proof that only appropriate access is granted to critical data will be maintained through Integrated Identity and Access Management system. Resource wise what types of auditing are required and how audit information is captured, stored and used will be detailed out. Track of user activities and access violations will be maintained using Identity and Access Management solution. Establishing a security auditing policies will result in early detection of attacks, alerting mechanisms to initiate emergency procedures.

Audit trail of following activities will be maintained-

- User activities
- Access violations
- Authentication events
- Authorization events
- Changes to directory objects

Trigger alarms and alerts will be generated in case of security breach.

The Identity and Access Management will be used to

- Track all changes in directory objects and access privileges
- Record all access activities and events
- Consolidate logs and events
- Compile reports and
- Trigger alarms and alerts

Audit trail will also help in monitoring activities of the Super user accounts, System administrators and system.

Required audit records will be produced and kept for an agreed period to assist future investigations and access control monitoring.

#### **5.2.3.4 Trust and Federation**

NeGP-Agriculture Mission Mode project will have large number of stakeholders in terms of Central / State Government Departments, agencies, divisions as well as private players. NeGP-Agriculture Project involves automation of the processes which span over various government departments, agencies, divisions. In some applications there may be need to share identity information of government employees, while some applications may need to share identity information with UID, Land Records, Ration Card, Kisan Credit Card, etc. To enable these applications to share identity information seamlessly, identity federation will be implemented. A federation is an association of organizations to exchange information about their users and resources in order to enable collaborations and transactions. The sharing of digital identities to enable federation is defined as “Identity Federation”.

It is a special kind of trust relationship between the organizations. The arrangement which enables users who can authenticate to one identity store to authenticate to a second one, even though they have no digital identity in the second store is called a trust relationship. Trust

relationships exist between separate realms, where realm defines a security boundary. It allows the identity information to flow across organizational boundaries, independent of platforms, application or security model. It enables users to work with different organizations/organizational units seamlessly as if they were part of the same security domain, while in fact the domains remain largely independent. It allows organizations to work together more efficiently, without the overhead of authenticating and authorizing each digital transaction or exchange of information which is also the requirement of NeGP-Agriculture Mission Mode Project.

## 5.2.4 Resources Classification

Every resource including information has following characteristics associated with it –

- Ownership – who is the fundamental owner of the resource
- Guardianship – who is the custodian of the resource
- Value / sensitivity – how sensitive is the resource from privacy, commercial or other (Security) perspective.

These attributes play a major role in determining who is able to access the information, to add, view, alter or delete it. Hence resources of NeGP-Agriculture will be classified based on these attributes and controlled.

Information classification includes -

- Inventory of information resources
- Classification
- Labeling

Level of sensitivity of data will be assigned when it is created, changed, enhanced, stored or transmitted. Classification of information will be done as

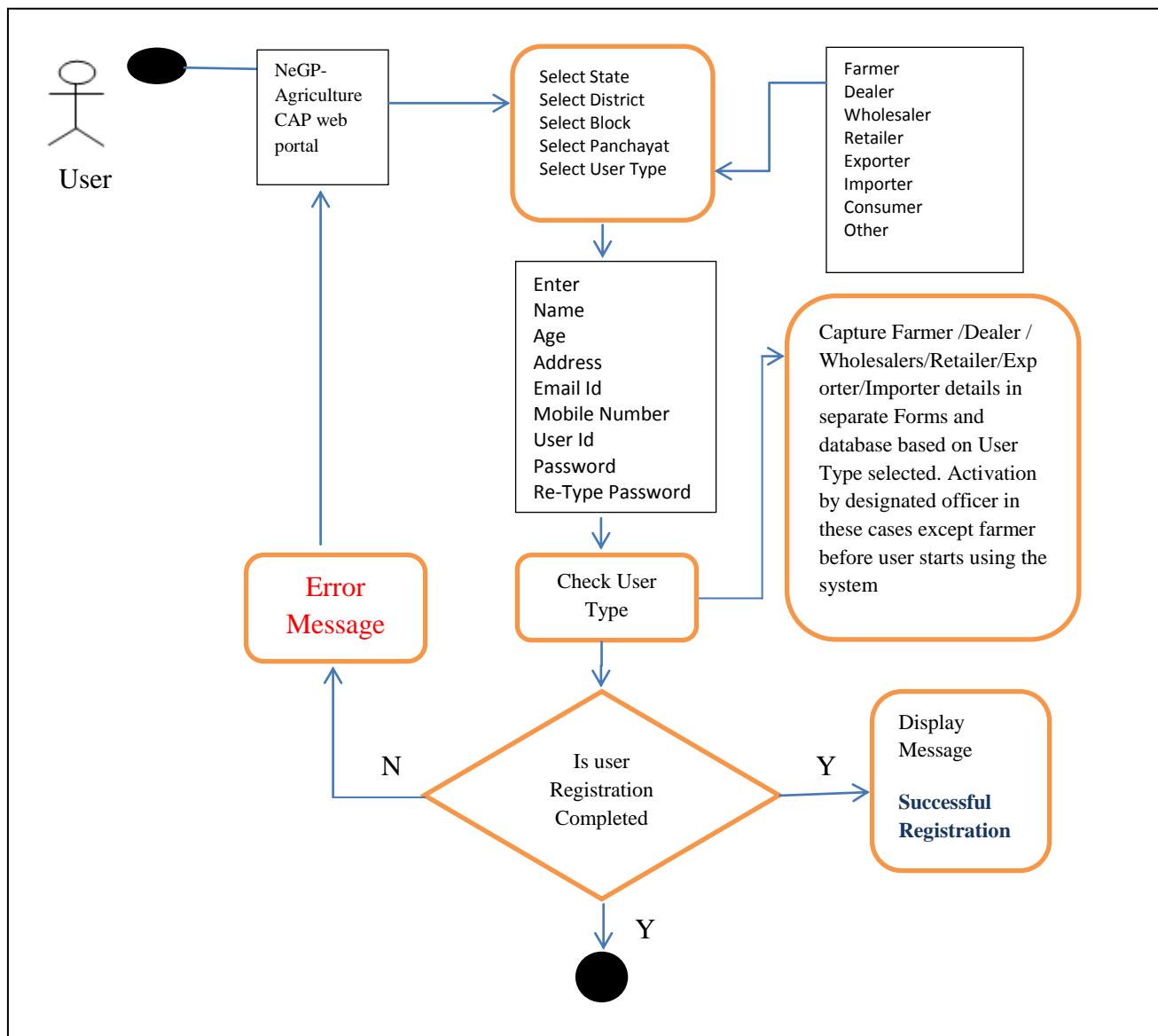
- Public domain
- Restricted
- Confidential
- Secret
- Top secret

All information and assets associated with information processing facilities are to be “owned” by a designated part of the organization and rules for the acceptable use of these will be identified at the time of information generation itself.

## 5.3 User Management (UM) – External users

User Management is an authentication feature that will provide administrators with the ability to identify and control the state of users logged into the network. This includes, but is not limited to, the ability to query and filter users that are currently logged into the network, manually log out users, and control user login counts and login times.

### 5.3.1 User Management (UM) – External users - Workflow diagram



**Figure - 43: External Users – Registration work flow diagram**

### 5.3.2 User Management (UM) – Functional Requirements

#### Module: User Management

**Objective:** All the official users of the proposed Agriculture MMP at the Central, State and sub state levels would require accessing the Central and State Agriculture Portals, as well as applications at various levels to enter, process, edit, delete and disseminate data. For this purpose a user management module is proposed, which would enable the users to access the proposed applications and portals, as well as allow administrators to assign roles and access rights to the users.

#### Functionalities:

- PG-FR1. The system shall allow the user to enter username into the user name text box
- PG-FR2. The system shall allow the user to enter password into the password text box
- PG-FR3. The system shall allow the user to submit the data entered
- PG-FR4. The system shall login the user in the portal on successful submission
- PG-FR5. The system shall prompt an error message in case the username and / or password do not match the preset submission
- PG-FR6. The system shall allow the user to change his/her password
- PG-FR7. The system shall allow the user to save changes to their revised password
- PG-FR8. The system shall allow the administrator to create new profiles
- PG-FR9. The system shall allow the administrator to delete profiles
- PG-FR10. The system shall allow the administrator to assign roles and access rights to new and existing users
- PG-FR11. The system shall allow the administrator to edit the roles and access rights for new and existing user
- PG-FR12. The system shall allow the administrator to save changes made to the role and access rights

Input Format	Description

<b>User Name</b>	Combination of alphanumeric and special characters with minimum length limit of 9 characters
<b>Password</b>	Combination of alphanumeric and special characters with minimum length limit of 9 characters
<b>Output Format</b>	<b>Description</b>
<b>Successful Login</b>	Acknowledgement of successful login
<b>Unsuccessful Login</b>	Prompt user in case of incorrect username and/or password
<b>Technical Error</b>	Prompt user with reason for technical error
<b>Successful submission of changes</b>	Acknowledgement of successful change in fields

### 5.3.3 Modules of User Management

#### 5.3.3.1 Adding and deleting Users

This consists of adding user account, deleting user account and to temporarily lock or unlock a user account

#### 5.3.3.2 Adding, editing and deleting User Groups

This consists of adding user group, editing user group, deleting user group. While editing user groups, system should make changes accordingly for all user assigned to that particular user group. System should not allow deleting user group, in case any user has been assigned to the selected user group.

#### 5.3.3.3 Adding user to a group, removing user from the group,

System should allow user to be added to a group, removed from the group.

#### 5.3.3.4 User Profile Security

An integral part of the User Management System is to maintain the security of the User Profile.

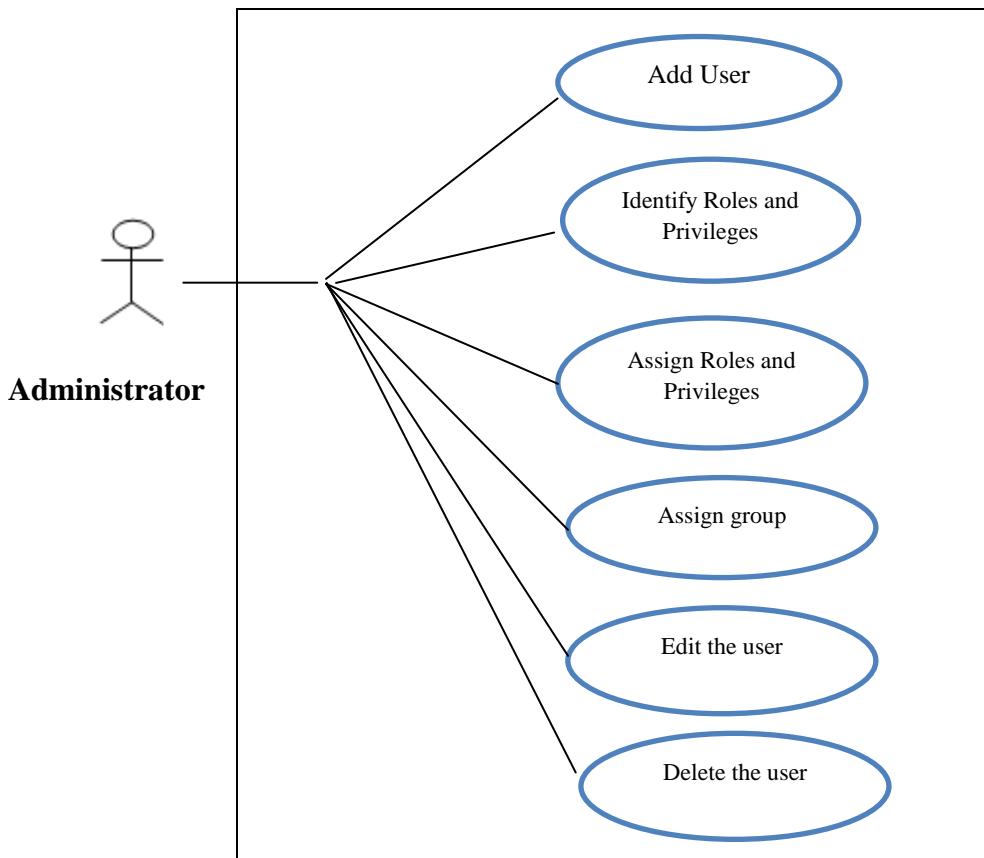
### 5.3.3.5 Password Policy

A strong password policy is one of the most important aspects of the security posture. Many successful security breaches involve simple brute force and dictionary attacks against weak passwords. In order to offer any form of remote access involving local password system, it is required to adequately address minimum password complexity requirements, maximum password lifetimes, and frequent audits of the authentication systems. At the same time these requirements should not be very stringent for users to handle necessitating them to write down the passwords thus instead of increasing security of the system, finally resulting in compromising it. For NeGP-Agriculture Mission Mode Project, this balance will be maintained. Depending upon the type and level of users, privileges and sensitivity of services he is accessing, different password policies will be adopted for different types of users.

The following password requirements will be considered for accessing sensitive services -

1. Minimum Password Length - 8 characters
2. Maximum Password Length - 14 characters
3. Minimum complexity Requirements
  1. Prohibition of words found in a dictionary or the user's personal information.
  2. Passwords should include -
    1. Lowercase letter
    2. Uppercase letter
    3. One or more numerical digits
    4. Special characters such as !@#\$%^&\*(){}[]
4. Passwords to be case sensitive. User name or login ID need not be case sensitive.
5. Password history - Require a number of unique passwords before an old password may be reused.
6. Maximum password age - 90 to 180 days
7. Minimum password age - 2 days
8. Account lockout threshold - 5 failed login attempts or
9. Account lockout duration– 20 minutes. This means if there are three bad attempts in 20 minutes, the account would be locked.
10. Reset account lockout after - Depending on the nature of services user accessing, either the administrator will reset the account lockout or the account lockout will be reset automatically after the period between 30 minutes and 2 hours.

### 5.3.4 Use Case Diagram for the management of Internal Users



**Figure - 44: Internal User Management- Use case Diagram**

The use case diagram as depicted in Figure 44 shows the activity of the Administrator in User Management Task. The Administrator will decide the user to be added after getting a request from the user.

The user needs to register first at the Portal. Once the Registration process is completed administrator follow the following steps to approve user:

1. The Administrator receives the registration information of user.
2. Identify the type of user on the basis of registration information received and assigns user to a group
3. Identify the roles and privileges for the user.

4. Add the user to the portal
5. Assign privileges to access the documents / sections / applications / system resources of the portal.
6. Assign privilege to edit the user.
7. Delete the user or set the flag for blocking the user, if user is not active for a long duration or found in activity of misuse of portal as decided by controlling officer.
8. For External Users, if the user is Farmer or Citizen then he/she need not be verified by administrator (It may not possible to track large number of users) for normal cases. Verification will be needed only if he/she is applying for some schemes, services other than Grievances or expert advisory.
9. External users like manufacturers, wholesalers, dealers, traders will be verified by respective application administrators, they would like to access.
10. However administrator should have right to delete or update the above users as mentioned in point 8 or to decide document access permission of portal to such users depending upon situation or decided by controlling authority.

### **5.3.5 Use Cases for User Management**

Use Cases for User Management can be categorized as follows:

- a) Create Role
- b) Create User Group
- c) Create Users
- d) Login
- e) Logout
- f) Change /Reset Password
- g) Forget Password
- h) Update User Profile

### 5.3.5.1 Use Case for Create Role

<b>Use Case No</b>	UC_UM_CR
<b>Use Case Name</b>	<b>Create Role</b>
<b>Primary Actor</b>	User with the assigned privilege of User Manager
<b>Secondary Actor</b>	None
<b>Description</b>	<p>This use case allows the Actor to Create roles. Each role is given permission to access forms/modules in the system while creating Users.</p> <p>While on the CAP, field level permissions can also be assigned to the role.</p> <p>Each application's User Manager would be allowed to create their respective application-specific Roles as per assigned privileges.</p>
<b>Pre Condition</b>	The actor is logged in and is viewing the System Administration Page of respective CAP application or the CAP.
<b>Trigger</b>	Actor chooses to create a new role option available under System Administration → Create Role.
<b>Primary Flow</b>	<p>System prompts actor to fill in the following fields:</p> <ol style="list-style-type: none"> <li>1. <b>Role Name:</b> Actor enters the Role Name.</li> <li>2. <b>Role Description:</b> Actor enters the role description.</li> <li>3. Actor fills in all mandatory fields clicks on Save, New role is created and System displays the message “New Role was created successfully”.</li> <li>4. If actor clicks on Clear, the form would be cleared.</li> <li>5. If actor clicks on Close, the form would be closed and the System would return back to Pre Condition.</li> <li>6. If the actor clicks the Cancel button, the system would respond with the message, “Would you like to discard the Role details?” If the actor responds with “Yes”, then the entered details would be lost and the System would return back to Pre Condition. If the actor responds with “No”, the actor would be returned back to the Create Role screen.</li> </ol>

<b>Alternate Flow</b>	None
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. The Role details would be saved in the database.</li> <li>2. Created roles will be available for modification and deletion through <b>Modify Role</b> and <b>Delete Role</b> use cases respectively as soon as these are created.</li> <li>3. Created role will be available for further creating User Groups through <b>Create User Group</b> Use Case.</li> <li>4. Audit Log is updated with the operation.</li> </ol>
<b>Business Rules</b>	<ol style="list-style-type: none"> <li>1. Role Name is mandatory field.</li> <li>2. Role name should be unique within a specific CAP application system.</li> <li>3. User Manager of specific CAP application should be able to Create Role(s) under his/her respective application only.</li> <li>4. While User manager of CAP should be able to create role(s) under any CAP application.</li> <li>5. In case User Manager of CAP has logged in, then the CAP application drop box would populate all CAP application names as specified in the <b>Enabled/Disabled CAP Applications</b> Use case for selection.</li> <li>6. In case User Manager of specific CAP application has logged in, then the CAP application drop box would populate the respective CAP application name(s) for which actor has been assigned the User Manager.</li> <li>7. User Manager will be provided complete tree structure of applications, modules, components and subcomponents in hierarchical form, up to the lowest level along with checkboxes in front of each item for each type of privilege like read, write, add, delete, modify, view etc. to grant appropriate permission on respective item. He will be able to expand or collapse the components and subcomponents of the CAP and CAP applications to grant access permissions.</li> </ol>
<b>Exceptions</b>	<b>Actor attempts to save, without entering the Role Name, then</b>

	<p>The system would respond with an error message “Role Name is not entered, Please enter a role name”.</p> <p><b>Actor attempts to save, when the same Role Name already exists within the selected CAP application.</b></p> <p>The system would respond with an error message “Role Name already exist, Please enter a different value”.</p>
<b>Relationships</b>	<p><b>Extends</b> View System Administration Page of respective CAP application or CAP.</p> <p><b>Is Extended By</b> None</p> <p><b>Uses</b> Login</p>
<b>Special Requirements</b>	<b>None</b>
<b>Assumptions</b>	<b>None</b>
<b>Outstanding Issues</b>	<b>None</b>

### 5.3.5.2 Use Case – Create User Group

Use Case Field	Description
Use Case ID	UC_UM_CUG
Use Case Name	Create User Group
Primary Actor(s)	User Manager or the person authorized with the assigned privileges of user group creation.
Secondary Actor(s)	<b>None</b>
Description	<p>This use case would allow the actor to create / add new user group.</p> <p>A user group will be created for respective CAP applications. User</p>

Use Case Field	Description
	<p>Manager of each application would be required to create their respective application-specific user groups.</p> <p>Firstly actor would form the roles as per the specific application needs using Create Role Use Case, and then the role can be assigned by the actor to the User group created through this Create User Group use case.</p>
<b>Pre Conditions</b>	<p>The actor is logged in and is viewing the <b>Create User Group</b> page under <b>System Administration</b> of the respective CAP application or CAP home page.</p>
<b>Triggers</b>	<p>Actor chooses to Create user group.</p>
<b>Normal Flow</b>	<p>The system would prompt the actor to enter the details as follows:</p> <ol style="list-style-type: none"> <li>1. Name of the user group –Actor would be required to enter the name of the user group.</li> <li>2. Roles – The Create User Group page will prompt the actor to select the roles being assigned to the user group. The actor may assign one or multiple roles to the single user group.</li> <li>3. Self Registration – This property determines whether the site would support self-registration by visitors (users who are not logged in) for the site i.e., whether visitors of the site can create their own user id and password. If the actor sets this property to Yes, then the visitors who self-register would be assigned this user group. This field would be enabled for the user groups like farmers/citizen etc who may access relevant information as per their need.</li> <li>4. The actor may click the Save button to save the User Group details.</li> <li>5. At any point of time, the actor clicks the Clear button to discard the details entered or clicks the Close button to close the Create User Group form.</li> </ol>
<b>Alternative Flows</b>	<p><b>None</b></p>
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. Actor clicks on Save and if all the mandatory details has been filled-in, she would be able to save the user group and the System would respond with the message, “The user group was saved successfully.”</li> </ol>

Use Case Field	Description
	<p>a. Created user group details would be stored in the database.</p> <p>b. User group details would be available for modification, deletion and view as per the assigned privileges.</p> <p>2. All saved User Groups would be available to the User Manager to create the users (through <b>Create User</b> use case).</p> <p>3. Audit Log is updated with the operation.</p> <p>4. In case the actor has not entered all mandatory fields, system will prompt the user to fill mandatory fields and system would not allow the actor to save the data until the entire mandatory fields are filled.</p> <p>5. If the actor clicked on the Cancel button, the system would respond with the message, “Would you like to discard the user group details?” If the actor responds with “Yes”, then the entered details would be cleared; if the actor responds with “No”, the actor would be returned back to the Create User Group screen.</p> <p>6. When the actor acknowledges the message, the System would return back to Pre Condition.</p>
Exceptions	<p><b><u>The actor attempts to save the user group details without specifying all mandatory fields.</u></b></p> <p>The system should respond with the message, ” Please specify the &lt;&lt;field name&gt;&gt;”.</p> <p><b><u>The actor attempts to save user group details when the user group name contains numbers only.</u></b></p> <p>The System should respond with the message, “User Group Name should contain at least one alphabet.”</p> <p><b><u>The actor attempts to save the user group details when a user group name contains special characters only.</u></b></p> <p>The System should respond with the message, “User Group Name should contain at least one alphabet.”</p> <p><b><u>The actor attempts to save the user group details when a user group name contains blank spaces only.</u></b></p> <p>The System should respond with the message, “User Group Name</p>

Use Case Field	Description
	<p>should contain at least one alphabet.”</p> <p><b><u>The actor attempts to save the user group details when a user group name with the same name already exists.</u></b></p> <p>The System should respond with the message, “User Group with the same Name already exists. Please Enter a different Name”</p>
<b>Priority</b>	<b>High</b>
<b>Business Rule</b>	<ol style="list-style-type: none"> <li>1) The following fields are mandatory to specify:             <ul style="list-style-type: none"> <li>○ Name of the User Group</li> <li>○ Select Role</li> </ul> </li> <li>2) Maximum permissible length for the field Name User Group should not exceed 20 characters including numbers (0-9), alphabets (a-z) and a set of 9 special characters / , - _ ( ) * &amp; : and space.</li> <li>3) Name of the User Group should contain at least one alphabet.</li> <li>4) Name of the User Group should be unique.</li> <li>5) Name of the User Group should not begin with blank space. If the first character of the user group name is blank space, then while storing in the database system, the character (other than space) should be considered as first character.</li> </ol>
<b>Relationships</b>	<p><b><u>Extends</u></b> CAP home page</p> <p><b><u>Is Extended By</u></b> None</p> <p><b><u>Uses</u></b> CAP Login</p>
<b>Special Requirements</b>	None
<b>Assumptions</b>	None

### 5.3.5.3 Use Case for Create User

Use Case Field	Description
Use Case ID	UC_UM_CU
Use Case Name	Create Users
Primary Actor(s)	User Manager/Admin user or the person authorized with the assigned privileges of user creation.
Secondary Actor(s)	<b>None</b>
Description	<p>This use case should allow the actor to create users based on the roles and privileges assigned to them for the CAP Applications.</p> <p>The user created through this use case would be able to log onto the CAP portal or into any specific CAP application directly.</p> <p>For external users, facility for self registration to be provided. For normal services like Grievance Registration, Expert advisory, Information access, user will not be verified by administrator. However for services like online applications for registration, licensing, assistance under schemes users will be verified by administrator of the particular applications user would like to access. For internal users, Actor would mandatorily specify whether user being created by him/her belong to Central level or State level. In case user belongs to the State, actor would also select the State of the user, which would establish the list of enabled CAP applications for the selected state. Refer Enable/Disable CAP application(s) Use case available under Content Management System. Further user may optionally select the District, Block and Village under the selected state.</p> <p>Actor would be able to create users at the same level or below his level i.e. He/she would be allowed to create users within his/her own state level or the level below his/her state.</p> <p>The actor could assign user group wise- role wise and application wise privileges to the users. The user could assign privileges for multiple CAP applications.</p> <p>Actor can also create multiple users in one go, through bulk users option.</p> <p>The bulk users can be created for specific User Group, Role and Entity Level.</p>

Use Case Field	Description
	Once bulk users are created, these would be available for further modification, deletion or viewing as similar to other normal users under Modify User, Delete User and or View User use cases.
<b>Pre Conditions</b>	<p>The actor is logged in to the portal having privileges of creating users under System Administration Page.</p> <p>If the pre define User Manager logs on to the portal for the very first time for user creation, the User Manager should be required to change the password and again logged on to the portal for user creation for various applications and assigning privileges to them.</p>
<b>Triggers</b>	Actor chooses Create User option available under <b>System Administration-&gt; Create User</b> .
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>1. Actor selects the User Type i.e. whether he/she wishes to create ‘Specific user’ or ‘Bulk Users’</li> <li>2. Actor chooses to create ‘Specific User’.</li> <li>3. Level – Central /State: The system should prompt the actor to select one of the options i.e. Central or State, under which he/she is going to create user.</li> <li>4. Select State Name: In case actor selects State, system should prompt the actor to select the State name from the drop down enlisting all the States of the country. Select one State.</li> <li>5. Select User Group: The System should display a list of user groups. Actor will select one user group.</li> <li>6. Select Role: Based on the selected user group, the system should display list of all the roles. The actor will select the role(s) which he/she wants to assign to the user. One user could be assigned multiple roles.</li> </ol> <p>Create User form would be partitioned in to four sections:</p> <ul style="list-style-type: none"> <li>(i) User Account Details</li> <li>(ii) Login Details</li> <li>(iii) User Profile Details</li> <li>(iv) Assigning Privileges</li> </ul>

Use Case Field	Description
	<p>7. The actor is prompted to enter the following User account Details:</p> <ul style="list-style-type: none"> <li>a. Select Level: The system should prompt the actor to select the level at which she desires to create the user. The levels could be District, Block or Village etc.</li> <li>b. Select Entity: i. The System should prompt the actor to specify the number of entities for which the user would be allowed to perform activity. In other words for how many Districts, Blocks and Villages the user is authorized. ii. Based on the selected State and the entity levels, the System should display list of Districts, Blocks and Villages. iii. Depending on the specified numbers, the actor could select the entity names for which the created user would be authorized to perform the activities assigned to him.</li> </ul> <p>8. In case, the actor selects level as Center, then the actor would be required to follow the steps 5th and 6th only.</p> <p><b>Login Details:</b></p> <p>9. The System should prompt the actor to specify following Login Details:</p> <ul style="list-style-type: none"> <li>i. User Id</li> <li>ii. Password</li> <li>iii. Confirm Password</li> </ul> <p>The ii. And iii. Fields would be entered by the user himself/herself whose user id is being created.</p> <p><b>User Profile Details</b></p> <p>10. The System should prompt the actor to specify following details related to the User Profile:</p> <ul style="list-style-type: none"> <li>i. Email – The actor should specify the email address of the created user or the email address to which the intimation email of the user creation is required to send.</li> <li>ii. Mobile Number – The actor should specify the Mobile number of the created user or the person to whom an intimation SMS of the user creation is required to send.</li> <li>iii. Default language – The actor should select the default language for the</li> </ul>

Use Case Field	Description
	<p>user from the drop box. The system should display all labels of the CAP and CAP application's in the selected default language. If the actor does not select any language, CAP and CAP applications should be displayed in the default English language. This default language could be changed by the user while logged on to the portal/application using <b>Switch Language</b> option available on the home page.</p> <p>Email Address and the mobile number are mandatory to specify.</p> <p>Assigning Privileges:</p> <p>11. The system will prompt the actor to specify the Privileges being assigned to the created user. The actor could assign following privileges to the user:</p> <ul style="list-style-type: none"> <li>a. CAP application: Actor would select the CAP application from the set of 12 applications list and CAP (Only, if the users are being created at the central level) for which the user would be authorized to perform various activities</li> <li>b. The CAP/System will prompt the actor to select the privileges from predefine set of privileges which he/ she wants to assign to the created user. The actor could provide authority of Addition, Modification, Deletion and View as specified for the selected item. The actor could specify form/field/module wise access rights. By default, the user will have full access rights of the selected application for the selected entity.</li> <li>c. The user with the assigned privilege of user manager of the individual service/application could modify the privileges assign to the selected user for that application only.</li> </ul> <p>12. Actor fills all mandatory fields and saves the data. On successful saving, system responds with the message “User Account “&lt;User id &gt;” has been created successfully”.</p> <p>13. Actor acknowledges the message.</p> <p>14. System returns back to Pre Condition.</p> <p>15. As soon as a user is successfully created, system will trigger an email and</p>

Use Case Field	Description
	<p>SMS on the specified email id and mobile number specified above.</p> <p>16. Through email, system will provide a link of the page on CAP portal or specific CAP application for setting his/her password i.e. provide his/her Password and Confirm Password values. The link provided would be valid for 7 days only.</p> <p>17. Through SMS, system will provide a Code word to the user, through which user will enter the page on CAP portal or specific CAP application for setting his/her password i.e. provide his Password and Confirm Password values. Similarly Code word provided would also be valid for 7 days only.</p> <p>18. In case, the link provided on the email id of the user gets expire after 7 days, the user would be required to register again (using <b>Register New User</b> use case) for the re creation of new user account.</p>
<b>Alternative Flows</b>	1. Actor chooses to create 'Bulk Users' in step 2 of Normal Flow.
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. The system should allow user to select level for which users are to be created as Central, State, District, block.</li> <li>2. Select State Name: In case the actor selects State, system should prompt the actor to select the State name from the drop down enlisting all the States of the country. Select one state.</li> <li>3. Select State and District Name: In case the actor selects District, system should prompt the actor to select the State name from the drop down enlisting all the States of the country and district name from the drop down listing all the districts of the selected State. Select one state and one district.</li> <li>4. Select State, District Name and Block Name: In case the actor selects Block, system should prompt the actor to select the State name from the drop down enlisting all the States of the country, district name from the drop down listing all the districts of the selected State and block name from the drop down listing all blocks of the selected district. Select state, district and block.</li> <li>5. The system should prompt the actor to select the User Group for the bulk users.</li> </ol>

Use Case Field	Description
	<p>6. The system should prompt the actor to select the Role for the bulk users being created. Based on the selected user group, a list of all the roles belonging to that user group should be displayed. The actor could select multiple roles for multiple applications (two different roles in different applications) for one user.</p> <p>7. The system will prompt the actor to specify access rights for Addition, Modification, Deletion and View for the bulk users under selected role for the selected application. The actor could specify form/field/module wise access rights.</p> <p>The System would prompt the actor to specify the details belonging to the following three sections:</p> <ul style="list-style-type: none"> <li>i. User Account Details</li> <li>ii. Login Details</li> <li>iii. User Profile Details</li> </ul> <p>8. The actor is prompted to enter the following User Account Details:</p> <ul style="list-style-type: none"> <li>a. Select Level: The system should prompt the actor to select the level at which she desires to create bulk users. The levels could be State, District, Block, etc.</li> <li>b. Select Entity: i. The System should prompt the actor to specify the number of entities for which the users are being created. In other words for how many Districts, Blocks and Villages the user is authorized. ii. Based on the selected State and the entity levels, the System should display list of Districts, Blocks iii. Depending on the specified numbers, the actor could select the entity names for which the users are being created.</li> </ul> <p><b>User Profile</b></p> <p>9. The System should prompt the actor to specify following details related to the User Profile:</p> <ul style="list-style-type: none"> <li>i. Email – The actor should specify the email address of the administrator to whom the intimation email of the created user ids and</li> </ul>

Use Case Field	Description
	<p>passwords could be sent.</p> <p>ii. Mobile Number – The actor should specify the Mobile number of the administrator to whom an intimated SMS of the user creation could be sent.</p> <p>iii. Default Language- The actor should select the default language for the created users from the drop box. The system should display all labels of the CAP and CAP application's in the selected default language. If the actor does not select any language, CAP and CAP applications should be displayed in the default English language. This default language could be changed by the user while logged on to the portal/application using Switch Language option available on the home page.</p> <p>Email Address and the mobile number are mandatory to specify.</p> <p>10. System generates the bulk user ids and passwords in a pre defined system generated format for all the available parameters in the selected criteria and user ids would be thrown to the specified email id and the mobile number of the administrator specified in the User Profile and to the pre defined User Manager for maintaining records. The portal displays the message “&lt;User id count&gt; user ids and &lt;Password count&gt; passwords are created successfully.”</p> <p>Actor acknowledges the message and System returns back to Pre Condition.</p> <p>11. The users would be required to change the system generated passwords while logged in for the very first time on the application through Change Password use case. As the user changes the password through <b>Change Password</b> use case and log on to the system again, the System will prompt the user to specify the personal details through the <b>Update User Profile</b> use case.</p> <p><u>Bulk users will have all the privileges (other than System Administration and Content Management System) based on the specified parameters for bulk users creation. For System Administration and Content Management System the user with the specific roles and privileges should be created.</u></p>

Use Case Field	Description
<b>Exceptions</b>	
<b>Priority</b>	High
<b>Business Rule</b>	<p>A user should be assigned permission to access at least one form/field/module under assign Privileges.</p> <p>For external users, facility for self registration to be provided. For normal services like Grievance Registration, Expert advisory, Information access, user will not be verified by administrator. However for services like online applications for registration, licensing, assistance under schemes users will be verified by administrator of the particular applications user would like to access.</p> <p>For internal users, Actor would mandatorily specify whether user being created by him/her belong to Central level or State level.</p>
<b>Relationships</b>	<p><b><u>Extends</u></b></p> <p>CAP Home Page</p> <p><b><u>Is Extended By</u></b></p> <p>Modify User (on CAP Applications)</p> <p><b><u>Uses</u></b></p> <p>Login</p>
<b>Special Requirements</b>	None
<b>Assumptions</b>	<b>All Privileges are being assigned at the user level.</b>

#### 5.3.5.4 Use Case – Login

Use Case Field	Description
<b>Use Case No.</b>	<b>UC_UM_LI</b>
<b>Use Case Name</b>	<b>Login</b>

Use Case Field	Description
<b>Description</b>	CAP User who has been given privileges in one or more resources of CAP.
<b>Actor(s)</b>	None
<b>Pre Condition</b>	<p>The main purpose of this use case is to allow the actors a secured access to the system by authenticating their User Id and password. The actor can log in to Central Agriculture Portal by directly invoking the URL of CAP or through the URLs of any of the 12 CAP applications. Once logged in through any of the URL i.e. either through CAP URL or specific CAP URL, actor would be redirected to the main page of CAP.</p> <p>Actor would choose the Login option provided in the main page of the CAP/ specific CAP application. The login option will be provided on the main page of CAP/CAP applications.</p> <p>The main page of CAP will display the Portlets of all 12 CAP applications which once clicked will invoke the respective application's main page (page displayed prior to Login). Once logged in, the actor can seamlessly browse any of the assigned CAP application by invoking the application's portlets available on the CAP. Once actor logs in, only those CAP application portlets for which user has the privileges would be visible. Refer Create User use case. The actor will be able to invoke any of the assigned CAP applications seamlessly as part of single sign-on.</p>
<b>Triggers</b>	<p>Actor has invoked CAP home page URL (<a href="https://agriculture.gov.in">https://agriculture.gov.in</a>) over the web.</p> <p>The actor is viewing the home page in English, the default language for the CAP and applications.</p>
<b>Normal Flow</b>	The use case is executed when the actor clicks the login link on the main page of the CAP, if the actor has directly invoked CAP.
<b>Alternate Flows</b>	<ol style="list-style-type: none"> <li>1. The actor would need to enter the user id and password.</li> <li>2. The actor chooses to Submit.</li> <li>3. The system authenticates the actor.</li> <li>4. In case actor is authenticated by the system i.e. user id and password entered by actor matches with the database, system logs in the actor.</li> <li>5. In case actor is logging in for the first time, System would prompt actor to enter his/her User Profile details referring to the User Profile use case. It would be mandatory for the actor to confirm the user profile details.</li> </ol>

Use Case Field	Description
	<p>6. Once the user profile details are confirmed, the system navigates the actor to the main page of the CAP, if the actor logged in from the main page of the CAP. In case the actor has directly accessed the specific CAP application through its own URL, then also system redirects the actor to the main page of the CAP.</p> <p>7. On the main page of CAP, only those CAP application portlets for which user has privileges would be visible. Refer Create User use case. The actor will be able to invoke CAP seamlessly as part of single sign-on by clicking any of the assigned CAP application(s) portlet(s).</p> <p>8. Each CAP application Portlet once clicked within the CAP would display the appropriate menu/list of options and application specific alerts depending on the actor's role and privileges for the selected CAP application. The alerts for the selected CAP application would be displayed as specified in Manage Alerts use case. Each time a CAP application portlet is clicked the selected CAP application would be opened in the new browser window.</p> <p>9. The actor may click the reset button, to reset the user id and password to blank.</p>
<b>Post Conditions</b>	<p>If in step 5 of Normal Flow, actor is not logging in for the first time, the System will follow the Steps 6 to 8 specified in the Normal Flow without prompting him/her to specify User Profile details. The actor may click the Reset button, to reset the user id and password to default.</p>
<b>Business Rules</b>	<p>When the actor successfully logs in to the CAP:</p> <ol style="list-style-type: none"> <li>The CAP applications which can be accessed by the actor depending upon his roles/privileges will be displayed as CAP applications portlets on the main page of CAP.</li> <li>Alerts, messages from the enabled CAP applications will be displayed on the respective home page of the CAP. Refer Manage Alerts use case.</li> <li>The home page to be displayed for each CAP application as assigned to the user in the CAP would be governed by the SRS of respective CAP application.</li> <li>The actor can access any of the enabled CAP applications without having to login again as part of single sign-on.</li> <li>User Name, Ministry/State, District Name, Block Name, Village</li> </ol>

Use Case Field	Description
	<p>Name associated with the user will be displayed at the top in all the pages of CAP and CAP applications accessed by the actor during the current session.</p> <p>6. The login details of the actor such as User-id, IP address and timestamp will be recorded in the database.</p> <p>7. Audit details will be updated for the action.</p> <p>When the actor successfully logs in to an CAP application accessed directly through its own URL :</p> <ol style="list-style-type: none"> <li>1. The system redirects the actor to the CAP.</li> <li>2. Main page of the accessed application is displayed within CAP.</li> <li>3. Alerts, messages from the enabled CAP applications will be displayed on the respective home page of the CAP application.</li> <li>4. The home page to be displayed for each CAP application as assigned to the user in the CAP would be governed by the SRS of respective CAP application.</li> <li>5. The actor can access any of the enabled CAP applications without having to login again as part of single sign-on.</li> <li>6. User Name, Ministry/State, District Name, Block Name, Village Name associated with the user will be displayed at the top in all the pages of CAP/ CAP applications accessed by the actor during the current logged-in session.</li> <li>7. The login details of the actor such as User-id, IP Address and timestamp will be recorded in the database.</li> <li>8. Audit Details will be updated for the action.</li> </ol>
<b>Exceptions</b>	<p><b>1. <u>Username or Password is not correct</u></b>  Actor chooses to login with incorrect username or password.</p> <ol style="list-style-type: none"> <li>a. System displays the message “Invalid Login. Either Username or Password is not correct.”</li> <li>b. Actor acknowledges the message.  System returns back to Pre Condition.</li> </ol> <p><b>2. <u>Actor is already Logged In</u></b>  Actor chooses to invoke multiple instances.</p> <ol style="list-style-type: none"> <li>a. System displays the message “User is already logged in. The user cannot login while an earlier session is active. Either kill the session or wait for system to deactivate the session”.</li> <li>b. Actor acknowledges the message.</li> </ol>

Use Case Field	Description
	<p>c. System returns back to Pre Condition.</p> <p><b>3. <u>User Account Details are being modified</u></b>  Actor chooses to login with correct authentication details  a. System displays the message, “You cannot login now as your user account details are being modified”.  b. Actor acknowledges the message.  System returns back to Pre Condition</p> <p><b>4. <u>Actor attempts to login with incorrect user id, password or both at least 5 times</u></b>  The System would display a captcha and prompt the user to enter captcha after specifying correct log in id and password.</p> <p><b>5. <u>Actor attempts to login with incorrect user id, password or both at least 10 times</u></b>  The System would respond with a message, “Your Account is temporarily blocked. Please try after 2 hours or contact System Administrator”.  Actor acknowledges the message. (If the account is not unblocked, the actor should contact to the System Administrator to unlock his account.)  System returns back to Pre Condition.</p> <p><b>6. <u>Actor Clicks the Reset Button</u></b>  The System would clear the username and password field and bring the Login Screen to the default scenario.</p>
<b>Relationships</b>	High
<b>Assumptions</b>	<ol style="list-style-type: none"> <li>1. The attributes User-id and Password are mandatory for logging into the application.</li> <li>2. If the actor is logged in to the application for the first time, it would be mandatory for him/her to specify user profile details through User Profile use case.</li> <li>3. While working on a single machine, at one point the actor can access only one instance of a particular CAP application. If the actor has successfully logged-in to the CAP directly or indirectly (through an application) as explained above, and tries to login to same or a different CAP application by invoking its URL on, the actor will be redirected to already active CAP session displaying the main page of the selected application as per the actor’s roles/privileges.</li> </ol>

Use Case Field	Description
	<p>4. Multiple logins from multiple machines in an application would be allowed by the system, without logging out the session(s) of already logged in user(s).</p> <p>5. In case of System-enforced logout, system should facilitate the user a seamless entry while re-login; preserving all related data.</p> <p>6. The text in the password field must be hidden and the text should appear as a combination of special characters '*' on the screen.</p> <p>7. As soon as user logs in for the first time in the system with the password provided to him, system should enforce user to Change Password to proceed further, using the Change Password Use Case.</p> <p>8. In case last logout of the actor happens to be the system enforced logout, then as soon as he/she logins again system should prompt with the message "Resume with last auto saved session?" In case actor confirms, system opens up the last session data values as saved by the system at the time of his/her system forced logout else system behaves as defined.</p>
<b>Special requirements</b>	<u>Extends</u> CAP/CAP Home Page <u>Is Extended By</u> None <u>Uses</u> None
<b>Outstanding Issue</b>	None
<b>Use Case No.</b>	None

### 5.3.5.5 Use Case for Logout

Use Case Field	Description
<b>Use Case No.</b>	<b>UC_UM_LO</b>
<b>Use Case Name</b>	<b>Logout</b>
<b>Description</b>	The main purpose of this use case is to allow the actor to logout from a

Use Case Field	Description
	<p>CAP application(s) or CAP.</p> <p>The actor can click the log out button displayed on CAP Pages and or CAP application(s) to quit from all or selective application(s) currently invoked within CAP.</p> <p>Each CAP application and CAP will time out as per the application time out settings (default – 20 minutes). The focus of the actor will be shifted to the application, which is about to be timed-out to enable the actor refresh that application, if he/she wishes so.</p> <p>The time out session of all CAP applications and CAP would be kept equal and be defaulted at 20 minutes (Configurable at CAP level).</p>
<b>Actor(s)</b>	User who has been given privileges in one or more CAP application(s) or CAP.
<b>Pre Condition</b>	The actor must be logged into the CAP.
<b>Triggers</b>	<p>The use case is triggered when:</p> <ol style="list-style-type: none"> <li>1. The actor clicks the ‘Logout’ link in the CAP Page.</li> <li>2. The actor clicks the ‘Logout’ link in the CAP Application.</li> <li>3. The actor closes the browser window.</li> <li>4. The system times out the actor/System enforced logout.</li> </ol>
<b>Normal Flow</b>	<p><b>Case 1: The actor clicks the ‘Logout’ link in the CAP Page.</b></p> <ol style="list-style-type: none"> <li>1. The actor clicks on the <b>Logout</b> link in the CAP Page.</li> <li>2. The system responds with a message: “You have chosen to logout of the CAP. This will close all the CAP applications invoked by you. Do you wish to continue (OK/Cancel)?” <ul style="list-style-type: none"> <li>a) If the actor clicks Ok button, all the applications are closed and the actor is logged out of CAP with the message: “You have successfully logged out. Thank you for using CAP”. The system clears the login details of the actor, releases the application resources and logs out the actor.</li> </ul> </li> </ol>

Use Case Field	Description
	<p>b) If the actor clicks Cancel button, the actor is brought back to precondition.</p>
<b>Alternate Flows</b>	<p><b>Case 2: The actor clicks the ‘Logout’ link in the CAP Application.</b></p> <ol style="list-style-type: none"> <li>1. The actor clicks on the <b>Logout</b> link in the CAP application.</li> <li>2. The system responds with a message: “You have chosen to logout of the CAP application. Do you wish to close all other CAP applications as well?”</li> <li>3. In case Actor clicks “Yes”, system closes all the CAP applications invoked by user. Else system only closes the selective CAP application from which Logout was invoked.</li> <li>4. If the actor clicks Cancel button, the actor is brought back to precondition.</li> </ol> <p><b>Case 3: Actor closes the browser window</b></p> <ol style="list-style-type: none"> <li>5. The system displays the message: “Do you wish to close the <b>current application</b>? Click “OK” to proceed else click “Cancel”.”</li> <ol style="list-style-type: none"> <li>a) If the actor clicks “OK”, system closes the application. (This would not impact the active sessions of other CAP applications.) i.e. on closing the specific CAP application browser window by clicking the cross symbol, system should close the session of that particular application post actor’s confirmation without logging out the user from CAP.</li> <li>b) If the actor clicks “Cancel”, actor is returned back to precondition.</li> </ol> <p><b>Case 4: Actor is about to be timed out of a CAP application</b></p> <ol style="list-style-type: none"> <li>6. In case an application is inactive and is about to be timed out as per the application time-out settings, the system will shift the focus of the actor to the application, five minutes in advance of application time out period and will display the message to the actor : “&lt;Time stamp &gt; : This application will time out in the next five minutes. Pl clicks</li> </ol> </ol>

Use Case Field	Description
	<p><b>Refresh</b> to refresh your session or <b>Cancel</b> to let it expire.” This message would be appended by the time stamp i.e. time when this alert message was triggered to the actor. In case, time out of CAP is approaching system would display the message as ““&lt;Time stamp &gt;: The CAP will time out in the next five minutes. Pl. clicks <b>Refresh</b> to refresh your session or <b>Cancel</b> to let it expire. This would logout your all active CAP applications.”</p> <ul style="list-style-type: none"> <li>a) If the actor clicks the <b>Refresh</b> button, the application is activated for further use.</li> <li>b) If the actor clicks <b>Cancel</b> button, the actor is timed out of application.</li> <li>c) If the actor does not take any action in the Refresh/Cancel dialog box within the time-out period, the application times out as scheduled. The system displays the message: “The application was timed out. Please click the application portlet to invoke it again” OR “You may access the application by connecting its URL, in which case you need to login again”.</li> <li>d) If multiple applications are about to be timed out, the message for each application will be scheduled so that each application informs the actor in advance and the actor is able to take an action before the applications time out.</li> <li>e) In case the actor is timed out of CAP, the system displays the message: You were timed out of CAP. To use the portal, please access URL and Login again”.</li> </ul>
<b>Post Conditions</b>	<p>Actor is successfully logout of the CAP or selected CAP application as per the case.</p> <p>Actor would no more be able to access any CAP application and the privileges assigned to him/her.</p>
<b>Business Rules</b>	<ol style="list-style-type: none"> <li>1. The actor must be timed out in case the application is inactive for a duration specified in application timeout settings (default 20 minutes)</li> </ol>

Use Case Field	Description
	<ul style="list-style-type: none"> <li>– Configurable at CAP level).</li> </ul> <p>2. System should generate alert(s) to the user when the session expiry time would be approaching (at least five minutes prior to the session time out time period).</p> <p>3. Time out session of the all CAP applications including CAP would be same and would be defaulted as 20 minutes.</p> <p>4. In case user is logged into different machines with the same user id, logout on one machine should not impact the session(s) on other machine(s).</p> <p>5. In case logout is happening in the inactive sessions of any of the CAP application and or CAP while actor is active in other CAP application, The focus of the actor will be shifted to the application, which is about to be timed-out to enable the actor refresh that application, if he/she wishes so.</p> <p>6. In case of System-enforced logout, system should facilitate the user a seamless entry while re-login; preserving all related data.</p>
<b>Exceptions</b>	None
<b>Relationships</b>	<p><b><u>Extends</u></b>  Main Page of CAP or CAP application</p> <p><b><u>Is Extended by</u></b>  None</p> <p><b><u>Uses</u></b>  Login.</p>
<b>Assumptions</b>	None
<b>Special requirements</b>	None
<b>Outstanding Issue</b>	None

### 5.3.5.6 Use Case - Change/Reset Password

Use Case Field	Description
<b>Use Case No.</b>	UC_UM_CRP
<b>Use Case Name</b>	Change/Reset Password
<b>Description</b>	This use case will allow the actor to modify his password for future login. The password can be changed from the main page of the CAP. As the password is changed, it will take effect for all the CAP applications for which user has permission.
<b>Actor(s)</b>	User with the assigned privileges of log on to the CAP or CAP application(s).
<b>Pre Condition</b>	The actor must have access to the application domain and be logged-in.
<b>Triggers</b>	The actor clicks the ‘Change Password’ link on the main page of the CAP.
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>1. The system prompts the actor to enter the Old Password.</li> <li>2. The system prompts the actor to enter the New Password.</li> <li>3. The system prompts the actor to re-enter the new password in Confirm Password textbox.</li> <li>4. The actor submits the details.</li> <li>5. If the update is successful, actor’s password is modified, the actor is navigated back to the precondition and the system responds with the message “Your Password was modified successfully”.</li> </ol>
<b>Alternate Flows</b>	None
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. The new password is saved in the database and the actor must use this modified password for future login in to the CAP or any of the CAP applications.</li> <li>2. From Security standpoint, as the password is changed, an e-mail and or SMS to the effect will be sent to the user on the valid e-mail and or mobile number of the user as specified in the user profile.</li> <li>3. Audit Log is updated with the operation.</li> </ol>
<b>Business Rules</b>	<ol style="list-style-type: none"> <li>1. The attributes old, new and confirm password are mandatory to specify.</li> <li>2. The text in the old password, new password and confirm password</li> </ol>

Use Case Field	Description
	<p>fields must be hidden and the text should appear as a combination of special characters ‘*’ on the screen.</p> <ol style="list-style-type: none"> <li>3. Maximum length for the fields old, new and confirm password should be of 12 characters containing minimum one special character, one numeric, one small case and one upper case letter.</li> <li>4. Similarly minimum length for the fields old, new and confirm password should be of 8 characters containing minimum one special character, one numeric, one small case and one upper case letter.</li> <li>5. Old password should match with the password existing in the database.</li> <li>6. The new password and confirm password entries entered by the actor must match.</li> <li>7. Three password value history needs to be stored in the system.</li> <li>8. The new password should not match with actor’s three previous passwords as per the security guidelines.</li> <li>9. The users would be required to change the system generated passwords while logged in for the very first time on the application through Change Password use case.</li> <li>10. System should not allow user to copy the Password field data to Confirm Password field. Copy and paste should be restricted in Password and Confirm password fields.</li> </ol>
Exceptions	<p><b><u>The actor attempts to save the changed password without specifying the Old Password.</u></b></p> <p>The System responds with the message, “Please enter the old password”.</p> <p><b><u>The actor attempts to save the changed password without specifying the New Password.</u></b></p> <p>The System responds with the message, “Please enter a new password”.</p> <p><b><u>The actor attempts to save the changed password without specifying the Confirm Password.</u></b></p> <p>The System responds with the message, “Please re-enter the new</p>

Use Case Field	Description
	<p>password in Confirm Password field”.</p> <p><b><u>The length of the new password is less than 8 characters.</u></b></p> <p>The system responds with the message, “The length of the password should be <math>\geq 8</math> characters”.</p> <p><b><u>The length of the new password is greater than 12 characters.</u></b></p> <p>The System responds with the message, “The length of the password cannot be greater than 12 characters”.</p> <p><b><u>The New Password is same as Old Password.</u></b></p> <p>The System responds with the message, “The new password you have entered is same as old password. Please enter a different password”.</p> <p><b><u>The New Password is same as one of the three Previous old Passwords</u></b></p> <p>The System responds with the message, “New Password cannot be same as previous 3 old passwords. Please enter a different password”.</p> <p><b><u>Confirm Password is different from New Password.</u></b></p> <p>The System responds with the message, “Confirm Password should be same as New Password”.</p> <p><b><u>Password entered is not valid i.e. it does not contain minimum one special character, one numeric, one small case and one upper case letter i.e. Actor submits with password not containing minimum either one special character or one numeric or one small case or one upper case letter.</u></b></p> <p>System displays the message “Password entered is not valid. Please enter password with at least one special character, one numeric, one small case and one upper case letter.” Actor enters the password with minimum one special character, one numeric, one small case and one upper case letter and resubmits.</p>
<b>Relationships</b>	<p><b><u>Extends</u></b>  Main Page of CAP  <b><u>Is Extended by</u></b></p>

Use Case Field	Description
	None. <b>Uses</b> Login
<b>Assumptions</b>	None
<b>Special requirements</b>	None

### 5.3.5.7 Use Case - Forgot Password

Use Case Field	Description
<b>Use Case No.</b>	<b>UC_UM_FP</b>
<b>Use Case Name</b>	<b>Forgot Password</b>
<b>Primary Actor</b>	Users who have privileges to log on to the CAP or CAP application(s)
<b>Description</b>	The main purpose of this use case is to allow the actor to reset his/her password if he/she has forgotten it.
<b>Pre Condition</b>	The actor must have access to the application domain and be on the login page.
<b>Triggers</b>	The use case is executed when the actor clicks the ‘Forgot Password’ link on the login page of CAP or any specific CAP application.
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>1. The system prompts the actor to enter one of the following:           <ol style="list-style-type: none"> <li>a. User Id, or</li> <li>b. E mail or Mobile No</li> </ol> </li> <li>2. The actor enters the User Id or Email/ Mobile No and clicks the Submit button.</li> <li>3. The system responds with the message “Password has been sent on your registered Email id and mobile number specified in the User Profile.”</li> <li>4. If the entered user-id or entered email / mobile no. exists in the system, system will trigger an email (in case email id is specified in User profile) or SMS (in case mobile no is specified in User profile).</li> </ol>
<b>Alternate Flows</b>	None

Use Case Field	Description
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. The set password is saved in the database for future logging.</li> <li>2. The actor is navigated back to the login page and must use this modified password for future login.</li> <li>3. Audit Log is updated with the operation.</li> </ol>
<b>Business Rules</b>	<ol style="list-style-type: none"> <li>1. User-Id or Email/Mobile no. fields are mandatory to specify.</li> <li>2. If a user is logged in, Forgot Password option will not be displayed to the logged in user.</li> </ol>
<b>Exceptions</b>	<p><b><u>If User Id or Email or Mobile No left blank and the actor attempts to submit.</u></b></p> <p>The system responds with the message “Please enter your User Id or Email or Mobile no</p> <p><b><u>Entered User Id or Email or Mobile no does not exist in the system.</u></b></p> <p>The system responds with the message “Either User id, Email id or Mobile no are invalid.”</p>
<b>Relationships</b>	<p><b><u>Extends</u></b> Login Page</p> <p><b><u>Is Extended by</u></b> None.</p> <p><b><u>Uses</u></b> None.</p>
<b>Assumptions</b>	None
<b>Special requirements</b>	None
<b>Outstanding Issues</b>	None

### 5.3.5.8 Use Case: Update User Profile

Use Case Field	Description
<b>Use Case ID</b>	UC_UM_UUP
<b>Use Case Name</b>	Update User Profile
<b>Primary Actor (s)</b>	CAP Users having access to one or more applications

Use Case Field	Description
<b>Secondary Actor (s)</b>	NA
<b>Description</b>	This use case will facilitate the actor to update his/her user profile created in the system while registering on the portal. The actor could update his/her personal information like designation, department, mobile number, email id etc so that the alert SMS and e-mail could be sent to his updated information.
<b>Pre Conditions</b>	Actor must be registered and logged on to the CAP/ applications.
<b>Triggers</b>	Actor chooses the link available as <b>Update User Profile</b> in the main menu.
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>As the actor clicks on the link available, the system will display the information like Department Name, Designation, Mobile Number and e-mail id as specified in the system while creating users through “Create User” use case.</li> <li>The system will facilitate the actor to update these details in their respective fields.</li> <li>After modifying the required details, the actor may chooses one of the following options: <ul style="list-style-type: none"> <li>- Update</li> <li>- Clear</li> <li>- Close</li> </ul> <b>Update:</b> The actor will choose this option, if he/she wishes to save the updated details in the system.  <b>Clear/Close:</b> At any point of time, the actor clicks the Clear button to discard the details entered or clicks the Close button to close the Update User Profile form. </li> </ol>
<b>Alternative Flows</b>	None
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>Actor clicks on Update and all the mandatory details has been filled-in, she would be able to save the updated user profile details and The System would respond with the message, “The user profile has been updated successfully.” <ol style="list-style-type: none"> <li>Updated user profile details would be stored in the database.</li> <li>User profile details would be available for</li> </ol> </li> </ol>

Use Case Field	Description
	<p>modification, and view as per the assigned privileges.</p> <p>2. System generated SMS alerts and e-mails would be sent to the user's updated mobile number and e-mail id.</p>
<b>Exceptions</b>	<p>Actor attempts to update user profile details without specifying any of the mandatory fields like department name, designation, mobile number or e-mail id.</p> <p>Depending on the un-specified field, the system will generate the following messages,</p> <p>“Please specify department name.”                  Or</p> <p>“Please specify designation”                  Or</p> <p>“Please specify your mobile number”                  Or</p> <p>“Please specify your e-mail id”</p>
<b>Priority</b>	<b>Medium</b>
<b>Business Rules</b>	<ol style="list-style-type: none"> <li>1. All fields are mandatory to specify</li> <li>2. Maximum Permissible length for the field Department and Designation should not exceed 75 characters including alphabets (a-z), numbers (0-9) and special characters &amp; - / () _, * :</li> <li>3. Mobile number should equal to 10 digits (0-9).</li> <li>4. E-mail id should have special characters @ and.</li> </ol>
<b>Relationships</b>	<p><b><u>Extends</u></b>  Create User Profile</p> <p><b><u>Is Extended By</u></b>  None</p> <p><b><u>Uses</u></b>  Log in</p>
<b>Assumptions</b>	None
<b>Special Requirements</b>	None

## 6 Grievances Redressal and Management System (GRMS)

It is mandate of each Government Department to provide clean, efficient and transparent administration. Grievance Redress Mechanism has always been the part of Administration. In fact, the grievance redress mechanism of an organization is the scale to measure efficiency and effectiveness of any government department as it throws light on the way in which administration of Government Department works. Administration or any system cannot be said accountable, responsive without having effective Grievance Redress Mechanism. Key challenge is to handle it effectively and promptly. Information and Communication Technology can help in establishing prompt, effective, service oriented Grievances Redressal and Management system.

Grievance Redressal and Management System has been included as major component under NeGP-Agriculture Mission Mode Project to provide efficient mechanism to receive and monitor grievances of the various stakeholders in agricultural sector especially farmer. Farmer is the major stakeholder in Agricultural Sector. Farmer does not have fixed income and many times depends on Government schemes and programs to meet both ends. Though Government schemes and programs in agricultural sector are being launched with good intentions, benefits may reach only partially or sometimes may not reach to the farmers at all due to denial of service or delay in processing. Most of the times farmers and other stakeholders in agricultural sector are not able to get satisfactory and total services from government departments. Delay is the major factor that generates the grievances. As per the DAR&PG analysis, even the redress of a grievance, that arose on account of delay, is also delayed by on an average six months. Timely availability of benefits under various schemes and programs is crucial for the farmers as these may lose their relevance if not made available on time during the various stages of the crop cycle. Farmers are at the receiving end as they do not have knowledge about the procedures, means, time and access to government mechanism to lodge their grievances against lack of or inefficient, delayed services resulting in mute acceptance of the system as it is. Grievances continue to arise because of a high systemic tolerance for delay and non-accountability in every day performance of functions. It is necessary to provide the efficient mechanism for timely receiving, addressing, managing and monitoring the grievances of all the stakeholders in this sector. Especially farmer should be empowered to register his grievances against the system which introduces delay and creates hurdles for him against timely availing benefits of the Government schemes and programs meant for him.

Already independent efforts have been made by Central Government Departments / State Government Departments for establishing the computerized system to address and manage the issues of public in various sectors. Some of these efforts have been discussed here in the next

section to learn from their experiences to design and build comprehensive Grievance Redress and Management System for agricultural sector under NeGP-Agriculture Mission Mode Project.

## 6.1 Existing System for Grievance Redressal and Management

The Central Government Ministries/Departments, their attached and subordinate offices and the autonomous bodies dealing with substantive functions as per Allocations of Business Rules, 1961 have their respective grievance redress machinery. An officer of the level of Joint Secretary is designated as Director of Grievances of the Ministry/Department/Organisation.

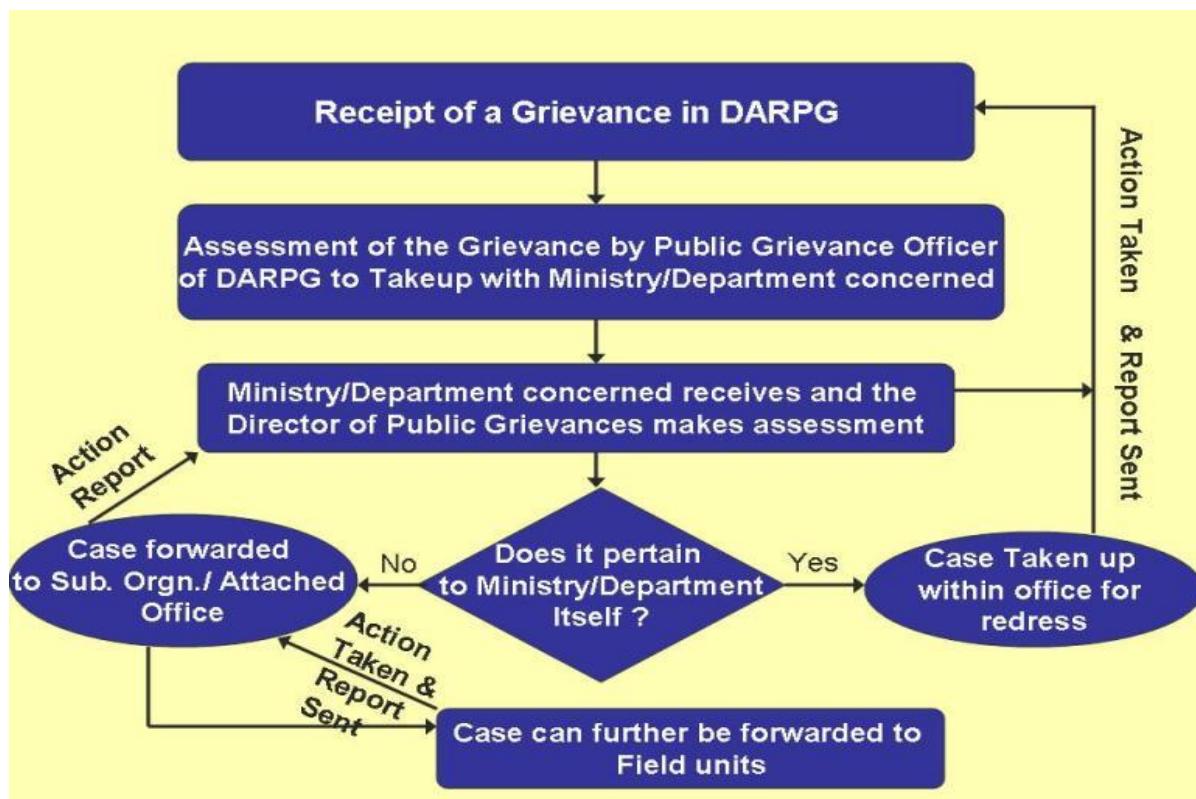
### 6.1.1 Online Public Grievance Lodging and Monitoring System (<http://pgportal.gov.in>)

The grievances of public are received at various points in the Government of India. There are primarily two designated nodal agencies in the Central Government handling these grievances. These agencies are-

- (i) Department of Administrative Reforms and Public Grievances, Ministry of Personnel, Public Grievances & Pensions
- (ii) Directorate of Public Grievances, Cabinet Secretariat

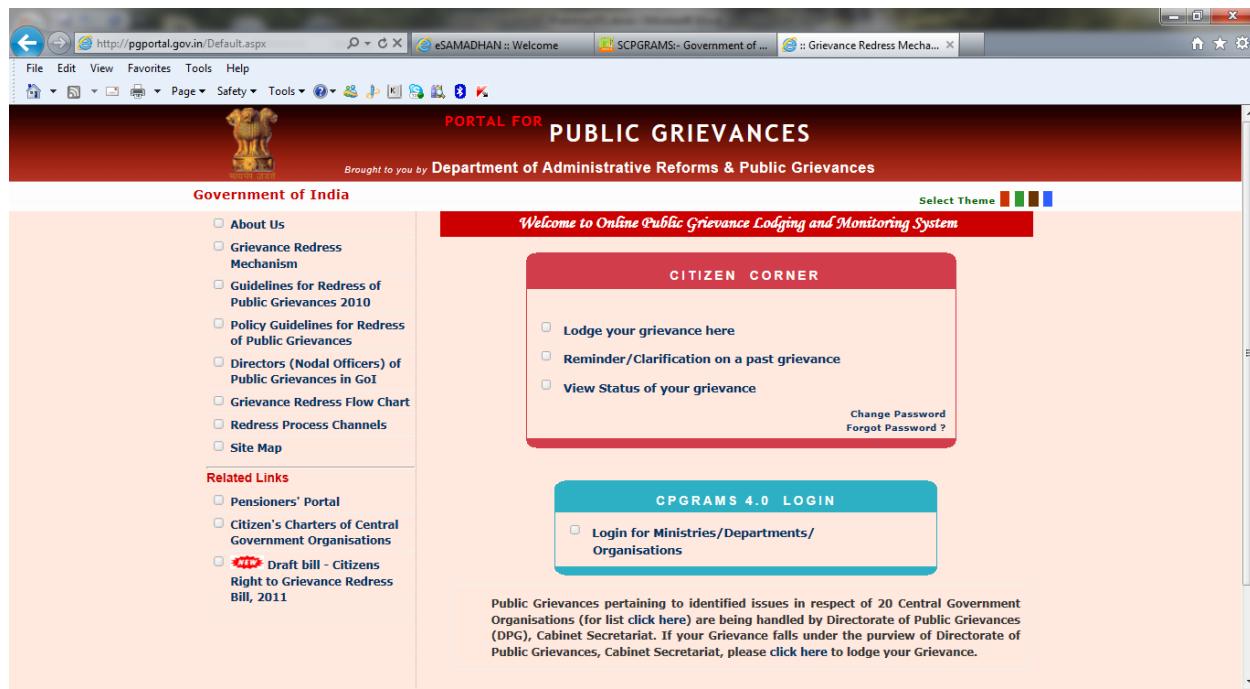
The Department of Administrative Reforms and Public Grievances (DAR&PG) is the nodal agency to formulate policy guidelines for citizen-centric governance in the country. Redressal of citizens' grievances, being one of the most important initiatives of the department, DAR&PG formulates public grievance redress mechanisms for effective and timely redress / settlement of citizens' grievances.

The DAR&PG in its endeavors to bring efficiency in public service delivery and to redress grievances of citizens in a meaningful manner by effectively coordinating with different Ministries and Departments of the Government and trying to eliminate the causes of grievances has implemented Online Public Grievance Lodging and Monitoring System (<http://pgportal.gov.in>), designed and developed by NIC.



(Source: <http://pgportal.gov.in>)

**Figure - 45: DAPRG – Workflow for Public Grievance Lodging and Monitoring System**



**Figure - 46: Public Grievance Lodging and Monitoring System - Home page**

If anyone having any grievance against any Government organization in the country may lodge his/her grievance on this portal which will go to the Ministry/Department/State Government concerned for immediate redress.

The grievances arising out of unsatisfactory response or No response from the Ministry/Department concerned is taken up by the Public Grievance officers of DAR&PG who in turn take up the matter with the Ministry/Department concerned for close monitoring and expeditious redress.

### 6.1.2 e- Samadhan (<http://esamadhan.nic.in>)

The “e-Samadhan” (<http://esamadhan.nic.in>) is a citizen-centric, web-enabled and work-flow based system developed by National Informatics Centre (NIC), Himachal Pradesh for automation, standardization and uniformity of the grievance redressal system in all departments of Himachal Pradesh. It has been implemented by the State Department of Administrative Reforms and Public Grievances and NIC in more than 54 major departments.



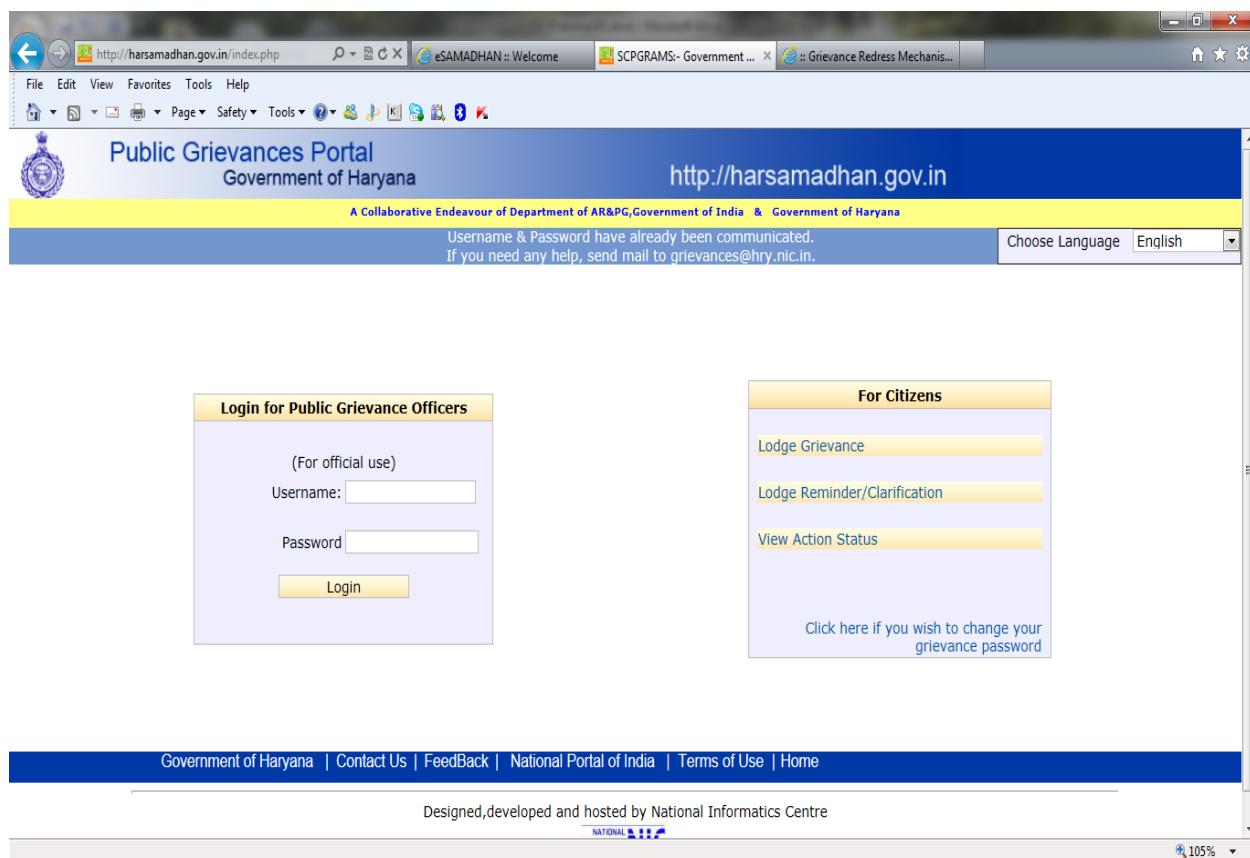
**Figure - 47: e-Samadhan - Home page**

## Key Features

- a. Bilingual Web Interface ( English and Hindi)
- b. Integration with SMS Gateway: SMS is automatically sent to applicant on submitting of application and on taking action on application by concern department.
- c. Availability of Graphical Analysis of Grievances redress for monitoring purpose
- d. Department wise / Grievance wise classification

### 6.1.3 HARSamadhan (<http://harsamadhan.gov.in>)

HARSamadhan is Centralized Public Grievances Redressal and Monitoring System implemented by Haryana State for receiving and monitoring the grievances. The Application is in Open Source Platform.



**Figure - 48: HARSamadhan - Home page**

### Key Features

- a. Each Grievance is being assigned a relevant category
- b. Focused on systematic gathering of data as well as its categorization and analysis to enable government agencies to prioritize the Grievances
- c. Facility to set reminder to subordinate office
- d. Provision to submit grievance in Hindi/English
- e. Facility to generate Acknowledge letter / Final Reply Letter

### 6.1.4 e – Lokshahi

The e – Lokshahi is an IVRS based system implemented in Jalgaon district of Maharashtra.

### Key Features

- a. People can query and lodge the complaints by dialing the number using phone
- b. The system acknowledges the caller by issuing the Token Number
- c. The concern officers gets the query / complaint and address the same on the web site by using login id and password
- d. If the complaint is not attended by concern officer in specified time frame , it is escalated to higher level officer
- e. The service does not require any additional set up and citizen can lodge the complaint by using their mobile or landline phone
- f. The system covers about 90 services and fully automated

### 6.1.5 Hortnet –Grievances Module (<http://hortnet.gov.in>)

The National Horticulture Mission (NHM) web site provides the facility to farmers for online submission of their complaint with respect to NHM schemes and programs.

### Key Features

- a. Farmers Registration Module
- b. Facility for applying training and survey
- c. Grievances status through farmer's ID number.



Figure - 49: HORTNET - Home page

### 6.1.6 National Food Security Web site (<http://n fsm.gov.in>)

The National Food Security Web site has the facility for submission of feedback/complaint.

#### Key Features

- a. Transfer of submitted application to concerned officer through email
- b. Sending of Response / Action taken report to complainant by e-mail

### 6.1.7 Chhattisgarh Gram Suraaj Application (<http://cg.nic.in/gramsuraj>)

Gram Suraaj Program is organized by Chhattisgarh Government for a particular period. Under this program administrative officers move to villages to hear and collect the grievances from the public and note these on specified computerized format. Later all applications are entered in online web application and transferred to concerned officers login. Concerned department's

officers take action and update the status. They can add the remarks. This whole process is fully computerized and online.



**Figure - 50: Gram Suraj Chattisgarh - Home page**

### Key Features

- Facility to generate and download application form with unique id number. YYYYSSDDBBBPPPVVVnnnn.  
Where YYYY – YEAR , SS – State Code , DD-District Code , BBB-Block Code , PPP- Panchayat Code , VVV – Village Code , nnnn – Application Number (Remain blank on printed form. Running 04 digit number will be assigned by the officer while collecting the applications from public).
- Facility to provide receipt on the spot by giving the above unique id number with basic details. Receipt is also attached in computer generated printed form.
- Complainant can check application status on the web site by using this unique id given on receipt or by receiving SMS after registering his/her mobile at web site.
- Department wise / Officer Wise status report of solved and pending cases for monitoring by District Administration. Different Bar Color like red, blue, green to indicate defaulters on the basis of applications pending at departments.
- Applications are categorized as – 1. Demand 2. Complaint

- f. Easy monitoring for applications received and cases resolved from State, District, Block and Village level just by mouse click.
- g. Availability of dynamic Bar Charts, Pie Diagrams to show the status of applications in the district.

### **6.1.8 Jhansi Jan Suvidha Kendra (JJSK)**

**(<http://www.jhansi.nic.in/jjsk.htm>)**

The District administration Jhansi has developed a telephone/mobile based e-governance platform for Grievance redressal known as Jhansi Jan Suvidha Kendra (JJSK) with the technical consultation of District Unit of Nation Informatics Centre (NIC). It was launched on 10th June, 2009 in the Collectorate campus, Jhansi.

Any person, from any place and at any time can call through landline/ mobile and register his grievance. The grievance is registered (online and in master register) and details of the grievance are also recorded automatically (as an audio file). The grievance is immediately marked to the concerned officer. Concerned officer is intimated telephonically for immediate action. A printout of this complaint bearing scanned signature of the District Magistrate is sent to him through Fax/Post/ Special Messenger. The objectives of JJSK is to provide round the clock, free of cost, easily accessible, responsive, user friendly, cost effective and time saving platform for public grievance redressal.



**Figure - 51: Jhansi Jan Suvidha Kendra (JJSK) - Home page**

## 6.2 Comparative Study of features

S.NO.	GRMS Name	Implementing Agency	Web Interface	IVRS	SMS Gateway	Language Support (English & Hindi)	Remark
01.	<b>e-Samadhan</b> ( <a href="http://esamadhan.nic.in">http://esamadhan.nic.in</a> )	Himachal Pradesh	✓	X	✓	✓	Implemented in about 54 departments in Himachal Pradesh
02.	<b>HARSamadhan</b>	Haryana	✓	X	X	✓	Open source Platform
03.	<b>Public Grievance Lodging &amp; Monitoring System.</b> ( <a href="http://pgportal.gov.in">http://pgportal.gov.in</a> )	GOI Portal	✓	X	X	✓	Centralized System
04.	<b>e-Lokshahi</b>	Jalgaon, Maharashtra	✓	✓	✓	✓	People can lodge the complaint through phone / mobile.
05.	<b>National Horticulture Mission</b> ( <a href="http://hortnet.gov.in">http://hortnet.gov.in</a> )	Central Govt.	✓	X	X		
06.	<b>National Food Security Mission</b> ( <a href="http://n fsm.gov.in">http://n fsm.gov.in</a> )	Central Govt.	✓	X	✓	✓	Facility to send grievance through email to concern officer

07.	<b>Chhattisgarh Gram Suraj Application</b> <a href="http://cg.nic.in/gramsuraj"><u>http://cg.nic.in/gramsuraj</u></a>	State Govt.	✓	X	✓	✓	Facility to generate and print the application form with unique id number, graphical reports
08	Jhansi Jan Suvidha Kendra (JJSK) ( <a href="http://www.jhansi.nic.in/jjsk.htm"><u>http://www.jhansi.nic.in/jjsk.htm</u></a> )	Jhansi District, Uttar Pradesh	✓	✓	✓	✓	24x7 support People can lodge the complaint through phone / mobile.

In spite of endeavor of various Government Departments, general public is ignorant of such initiatives or do not have means to approach the Government.

## 6.3 Scope of Grievance Redressal Management System

The following basic components shall be considered in the GRMS system:

- Provision for easier and approachable channel for submitting the grievances
- Multiple Gate Ways for submitting the grievances and for delivering the services
- Delivery of services in local languages

## 6.4 Service wise list of possible Grievances

Service No.	Service Name	Issues may arise from farmer/ stack holders/others
1.	Providing information on quality pesticides/Fertilizers/Seeds	a. Price b. Quality c. Availability d. Response of Dealers/Distributors e. License to Manufacture

		f. License to wholesale g. Registration
2.	Providing information on Soil Health	a. Soil Health Card b. Soil Testing Labs c. Use of Fertilizers
3.	Information on crops, farm machinery, training and Good Agricultural Practices (GAPs)	a. Training b. Farm Machinery
4.	Providing information on forecasted weather	a. SMS weather / crop Alert
5.	Information on prices, arrivals, procurement points, and providing interaction platform	a. Price related Issue b. Procurement related Issue c. Market related Issue
6.	Electronic certification for exports & imports	a. Electronic Certificate Issue
7.	Information on marketing infrastructure	a. Storage Issue b. Packaging issue c. Equipment related issue
8.	Monitoring implementation / Evaluation of schemes & programs	a. Issues related to Physical progress b. Issues related to Fund Utilization
9.	Information on fishery inputs	a. Fish Safety b. Fish Disease c. Quality Control d. Dealers Issues e. Packaging issue f. Exporting and Marketing issues g. Price issues
10.	Information on irrigation infrastructure	a. Issues related to Watershed b. Issues related to irrigation c. Issues related to water release
11.	Drought Relief and	a. Issue related to Govt. Aid b. Expert Advisory

	Management	
12.	Livestock Management	<ul style="list-style-type: none"> <li>a. Training</li> <li>b. Disease</li> <li>c. Marketing</li> <li>d. Price</li> </ul>

## 6.5 Proposed Solution

Based on above scope and systems studies, the proposed solution for GRMS suitable for A-MMPs can be envisaged. Following points shall be considered in the development of GRMS for NEGP-AMMP-

- a. The GRMS shall be the part of the NeGP-AMMP and interact with all 12 services of A-MMPs, to provide an integrated common platform for all types of grievances.
- b. The grievances in GRMS will be received from grass root level i.e. from the farming community across the country. The technological solution should be easy to use for them.
- c. Facility has to be provided for submitting the grievance in GRMS through multiple channels like Web / SMS / e-mail / IVRS interface and using paper forms which will be scanned and uploaded at Kisan Call Centre, Common Service Centres, Information kiosk, etc. available in the vicinity of the farmers.
- d. It should have provision to acknowledge the complainant by issuing Grievance registration number through SMS / e-mail / IVRS / WEB Interface.
- e. The System should support multi languages / regional languages and ensure that Localisation (L10N) and Internationalisation (I18N) features;
- f. Automatic generation of reminder / SMS alert to concern officer, if action has not been taken in specified time.
- g. The GRMS system shall be automatic as much as possible with less human intervention except for submitting and updating the status of grievances.
- h. Provision for broadcasting of any specific / urgent information for farmers / Stakeholders / Government Officers in case of any calamity
- i. Facility in GRAM to forward the application to concern authority through email with update Link for updating the application remark and status
- j. Provision to inform status of the action taken on the grievances submitted through SMS, e-mail and web based.

- k. It will have interface with Public Grievance Lodging & Monitoring System of DAR&PG.
- l. Proposed solution should be able to provide tool for monitoring and managing grievances. For this it should provide graphical reports.
- m. Proposed solution have interface to include grievances raised in newspapers and social media by Ministry official responsible for Grievance Redress.

Using the proposed solution, Ministry of Agriculture not only should be able to resolve the grievances received, but on the basis of the grievances received, it should be able to identify the problem areas in Government which are complaint-prone with respect to agricultural sector. So that these problem areas are then further studied and analyzed and remedial measures can be taken.

### 6.5.1 Objectives

- 1. Establish a single window system for farmers and other stakeholders to register their grievances
- 2. To bring efficiency and effectiveness in Grievance Redress
- 3. To bring transparency
- 4. 24x7 access for farmers and other stakeholders of Agricultural sector to lodge the complaints using the channels available in their vicinity
- 5. Workflow based Grievances Redress and Management System
- 6. Publishing the public grievances work and receipt/disposal statistics relating to redress of public grievances for common public
- 7. Easy monitoring from higher levels – To review of receipt and disposal of grievances, to track no response, delayed response of incomplete and non-satisfactory response
- 8. Availability of database and analytical reports to record and monitor the progress of grievance redress, identify the section/division where it is being sent, etc., know the time taken in dealing with the grievance, enable review of pending grievances to study problem prone areas and suggest remedial measures for prevention
- 9. Ability to fix time limits for disposal of work relating to public grievances and generate automated alerts if these time limits are crossed.
- 10. Online acknowledgement generation of each grievance petition, indicating the name, designation and telephone number of the official who is processing the case, the time frame in which a reply will be sent.

## 6.5.2 Expected Outcomes

- Easy interface to submit the Grievances
- Effective Monitoring of Grievances
- Immediate Dissemination of information to farmer and concerned user

## 6.5.3 GRMS - Modules

1. User Registration
2. Grievance Submission and acknowledgement
  - a. By Complainant
    - i. Web - with facility to upload scanned document
    - ii. e-mail with facility to accept attached document
    - iii. SMS
    - iv. IVRS
  - b. By officers for Grievances appeared in Print and social media
3. Officers dashboards and workflow system for processing the grievance
4. Application Status Alerts and Tracking, Decision, reply – through Web interface, e-mail, SMS, IVRS
5. Other related information – contact address (name, designation, room number, telephone number, fax) of Director of Grievances and other officers dealing with grievances, their roles and functions, procedures, FAQs etc.
6. Management reports helpful in monitoring and analyzing and identifying nature and areas of dissatisfaction to take action pro-actively

From the Central Agricultural Portal the Grievance will be redirected to the State, District or Block Offices. The L1, L2 and L3 Officers then check the Validity of the Grievance and answer it accordingly.

The User will be able to login any time and check the Status of his or her Grievance. He or she will also receive an email notification and an SMS alert once the Grievance is answered. The higher level officers will also obtain reports on the Status of the Grievances.

### 6.5.4 Design Architecture

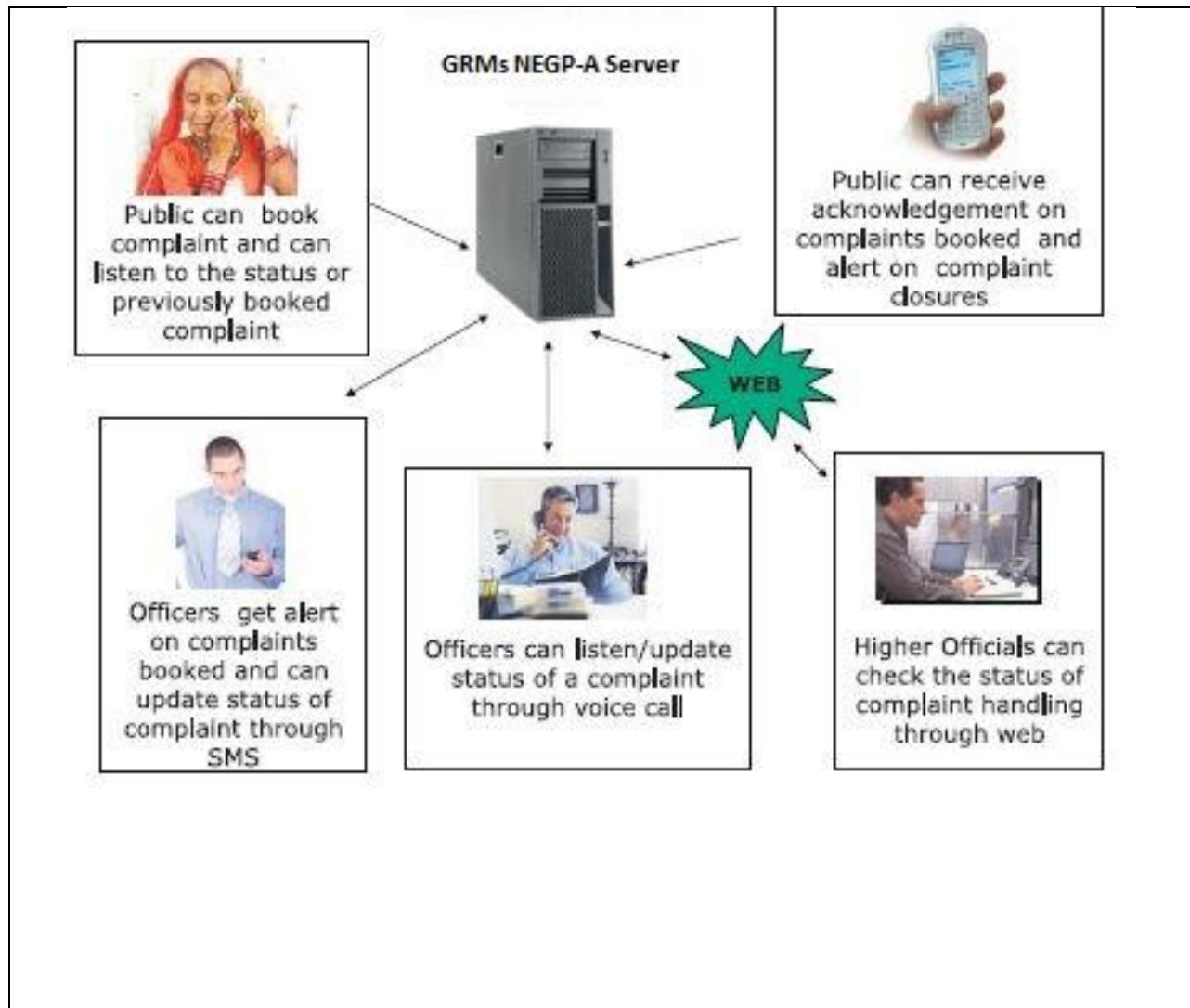
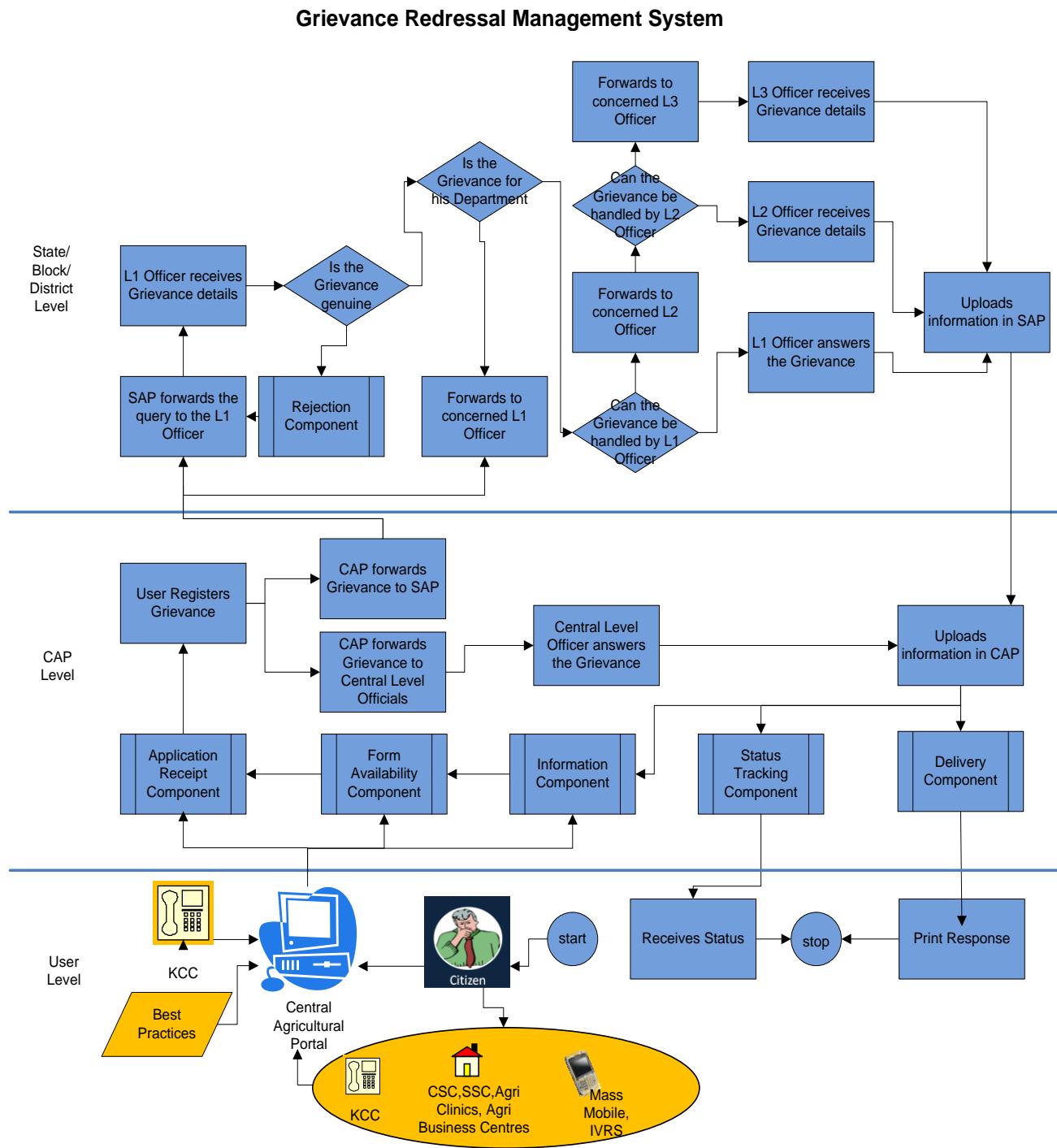


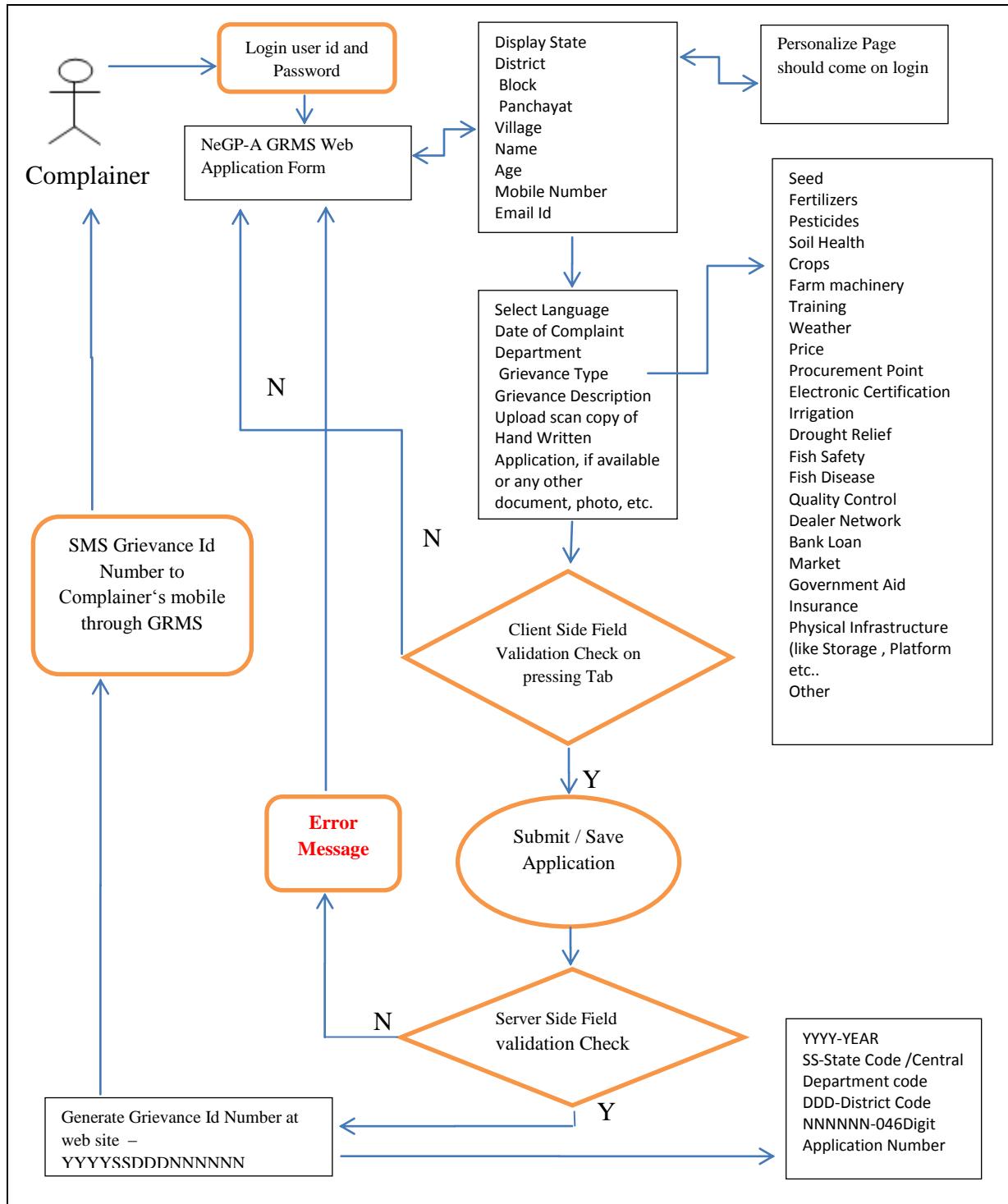
Figure - 52: Grievance Redressal and Management System – Design Architecture

## 6.5.5 Process Flow for Grievance Redressal Management System



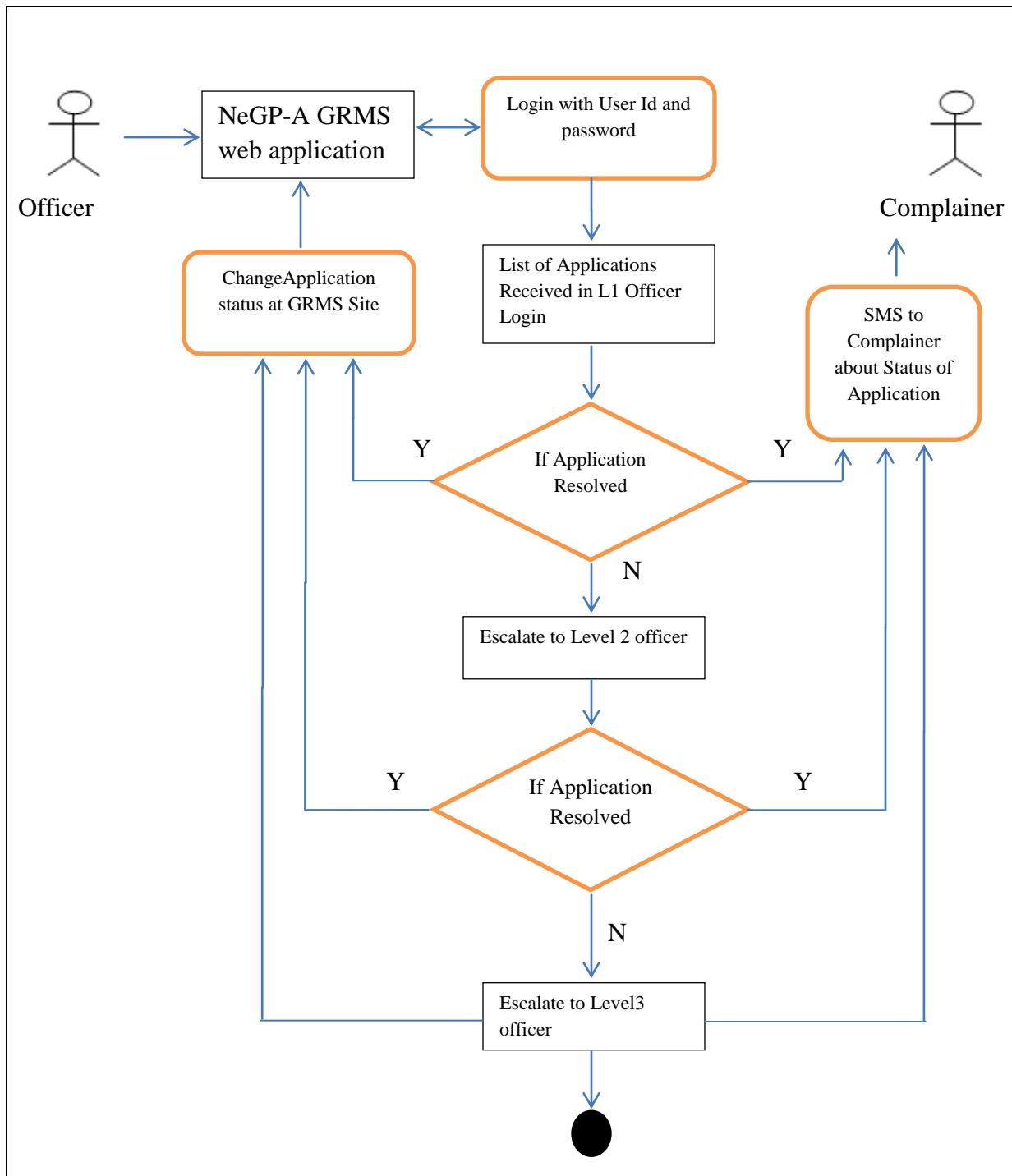
**Figure - 53: Grievance Redressal and Management System – Process Flow**

## 6.5.6 Workflow diagram - Grievance Submission



**Figure - 54: GRMS – Workflow Diagram for Grievance Submission**

## 6.5.7 Workflow diagram - Review received complaints



**Figure - 55: GRMS – Workflow Diagram for Review Received Complaints**

### 6.5.8 GRMS - E-R Diagrams

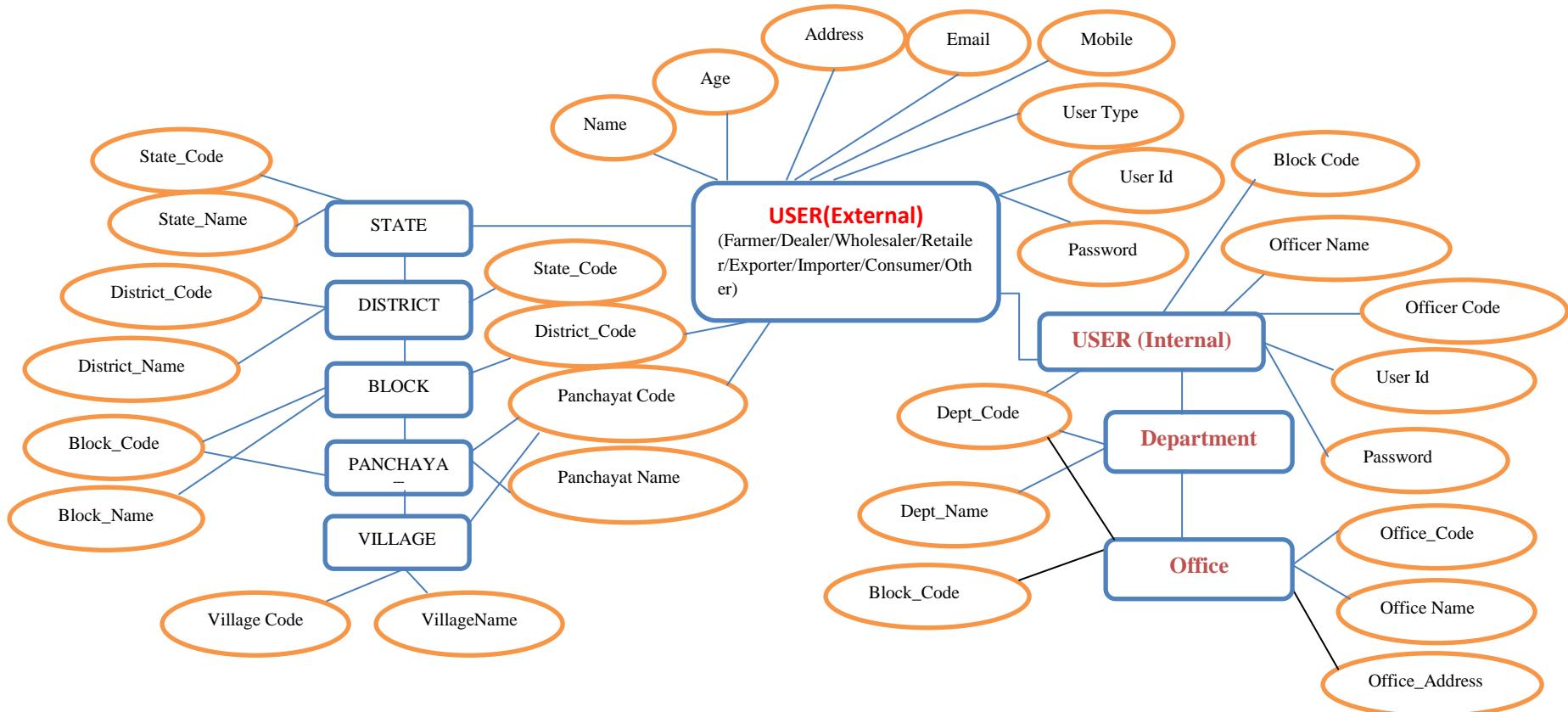
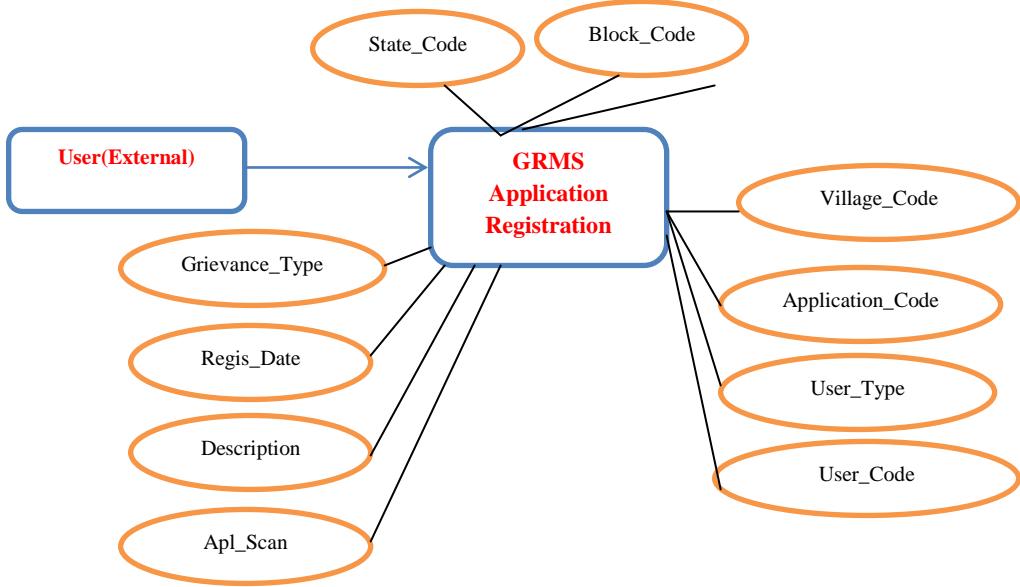
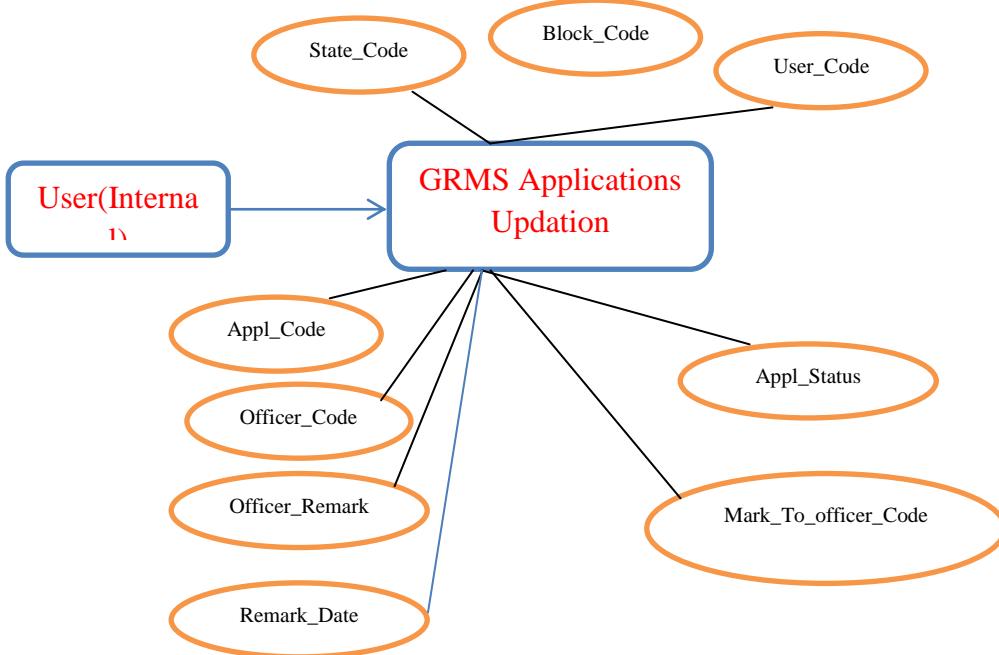


Figure - 56: GRMS – E-R Diagram



**Figure - 57: GRMS – E-R Diagram for Registration of Grievances**



**Figure - 58: GRMS – E-R Diagram for Updation of Grievances**

## 6.5.9 Functional Requirements

Module: Grievance Management	
<b>Objective:</b> The grievance management module would allow the farmers/users to submit, track and see the responses provided by the officers on their grievances. The module would allow officers to respond, track and close the grievance within the specified service level.	
<b>Functionalities:</b> The system shall provide the list of all possible grievances -	
GM-FR1.	The system shall allow the user to register grievance under “others” category
GM-FR2.	The system shall be able to retrieve grievance submission form
GM-FR3.	The system shall allow the user to enter the data, alphanumeric and special characters
GM-FR4.	The system shall ask for re-confirmation of the user before actually submitting the form
GM-FR5.	The system shall be able to channel as well as handle different grievances
GM-FR6.	The system shall prompt the user in case of any error while submitting the grievance
GM-FR7.	The system shall prompt the user in case the word limit has been exceeded
GM-FR8.	The system will provide the user with text formatting tools along with spell check option
GM-FR9.	The system shall acknowledge the user when the grievance gets successfully submitted and the system shall be able to generate a unique registration number after successful registration of a grievance
GM-FR10.	The system shall be able to identify the grievance uniquely based on this registration number for all future references
GM-FR11.	The system shall be able to route the grievance to concerned level one (L1) officer based on the grievance resolution matrix.
GM-FR12.	The system shall be able to route the grievance based on the type of the grievance selected during submission of grievance
GM-FR13.	The system shall allow the concerned L1 officer to accept / re-route / reject the grievance as per process description
GM-FR14.	In case of rejection/re-routing, the system shall allow the concerned L1 officer to state the reason of rejection
GM-FR15.	The system shall save the acceptance / rejection only based on digital signature of the L1 officer
GM-FR16.	In case of acceptance, the system shall open a new page with all the accepted queries by the concerned L1
GM-FR17.	The system shall allow the L1 officer to sought more data from the applicant, if

- required
- GM-FR18. The system shall allow the L1 officer to respond to the grievance
  - GM-FR19. The system shall allow the L1 officer to close the grievance after responding
  - GM-FR20. The system shall allow the L1 to close the grievance only based on his/her digital signature
  - GM-FR21. The system shall allow the L1 officer to forward the grievance to L2 officer, if necessary
  - GM-FR22. The system shall allow the L1 officer to forward the grievance to L2 only based on his / her digital signature
  - GM-FR23. The system shall allow the concerned L2 officer to accept / re-route / reject the grievance as per process description
  - GM-FR24. In case of rejection/re-routing, the system shall allow the concerned L2 officer to state the reason of rejection
  - GM-FR25. The system shall save the acceptance / rejection only based on digital signature of the L2 officer
  - GM-FR26. In case of acceptance, the system shall open a new page with all the accepted queries by the concerned L2
  - GM-FR27. The system shall allow the L2 officer to sought more data from the applicant, if required
  - GM-FR28. The system shall allow the L2 officer to respond to the grievance
  - GM-FR29. The system shall allow the L2 officer to close the grievance after responding
  - GM-FR30. The system shall allow the L2 to close the grievance only based on his/her digital signature
  - GM-FR31. The system shall allow the L2 officer to forward the grievance to L3 officer, if necessary
  - GM-FR32. The system shall allow the L2 to forward the grievance to L3 officer only based on his / her digital signature
  - GM-FR33. The system shall allow the concerned L3 officer to accept / re-route / reject the grievance as per process description
  - GM-FR34. In case of rejection/re-routing, the system shall allow the concerned L3 officer to state the reason of rejection
  - GM-FR35. The system shall save the acceptance / rejection only based on digital signature of the L3 officer
  - GM-FR36. The system shall allow the L3 officer to sought more data from the applicant, if required
  - GM-FR37. In case of acceptance, the system shall open a new page with all the accepted queries by the concerned L3
  - GM-FR38. The system shall allow the L3 officer to respond to the grievance
  - GM-FR39. The system shall allow the L3 officer to close the grievance after responding

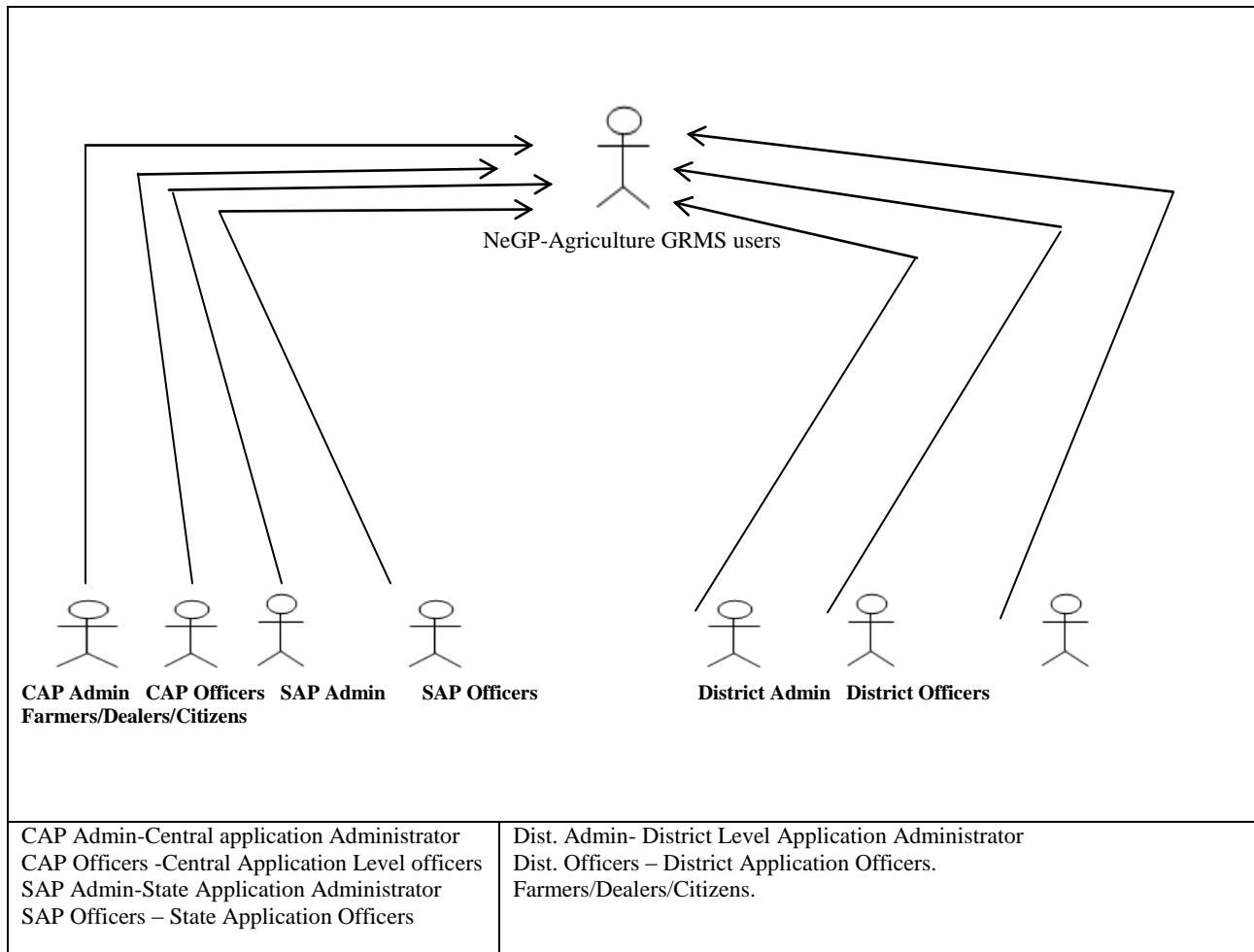
- GM-FR40. The system shall allow the L3 to close the grievance only based on his/her digital signature
- GM-FR41. The system shall be able to auto escalate the grievance if the service levels are not met as defined in the service level description for the process
- GM-FR42. The system shall follow the escalation matrix as defined in the process description
- GM-FR43. The system shall allow the applicant to view the response of officers on his / her grievance
- GM-FR44. The system shall allow the applicant to re-open the grievance
- GM-FR45. The system shall allow the applicant to provide more data related to grievance to officers during the resolution process, if required
- GM-FR46. The system shall ask for digital signature of officers for submission of the answer against the grievance

<b>Input Format</b>	<b>Description</b>
<b>Division Name</b>	Selection of division to be made from a drop-down menu
<b>Grievance Description</b>	Field size maximum 5000 including alphanumeric and special characters
<b>State</b>	Selection of state to be made from a drop-down menu
<b>District</b>	Selection of district to be made from a drop-down menu
<b>Applicant Name</b>	Field size maximum 20 characters
<b>Address</b>	Field size maximum 100 including alphanumeric and special characters
<b>Telephone/Mobile</b>	Field size maximum 15 numeric
<b>E-mail Address</b>	Field size maximum 50 including alphanumeric and special characters
<b>Output Format</b>	<b>Description</b>
<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful deletion</b>	Acknowledgement of successful deletion
<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Successful edition</b>	Acknowledgement of successful edition

<b>Unsuccessful edition</b>	Reason for unsuccessful edition
<b>Routing Application</b>	As per the escalation matrix / preference of the respondent
<b>Technical error</b>	Reason for technical error

## 6.5.10 Use Case Diagrams for Grievance Redressal Management System

This section shows the all possible type of users in NeGP-Agriculture GRMS through UML diagram. This will also show the use case diagram for all possible type of users.



**Figure - 59: Type of Users**

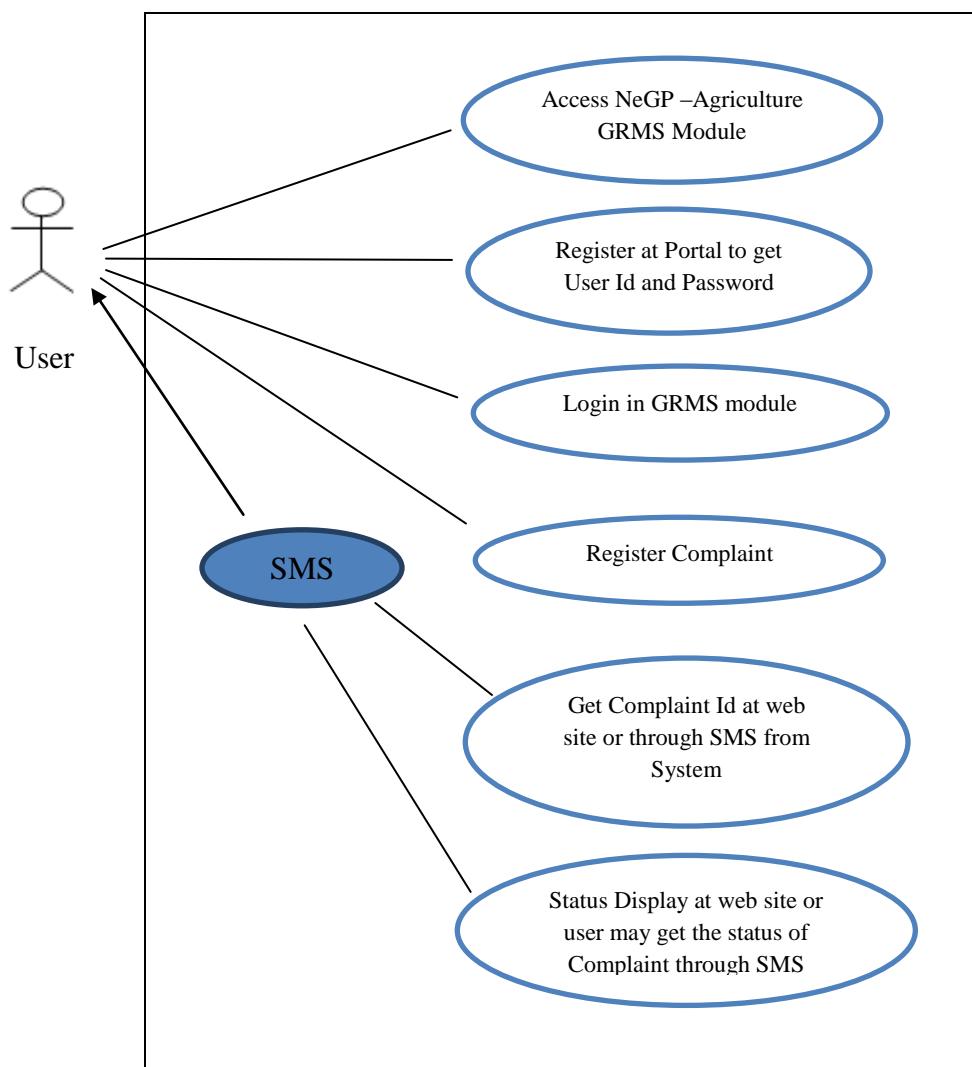
As per the functionality the user type can be categorized as -

- 1- Administrator
- 2- Active Users: Central Officers , State Officers , District Officers ( **Internal Users**)
- 3- Farmers/Dealers/Citizens- ( **External Users**)

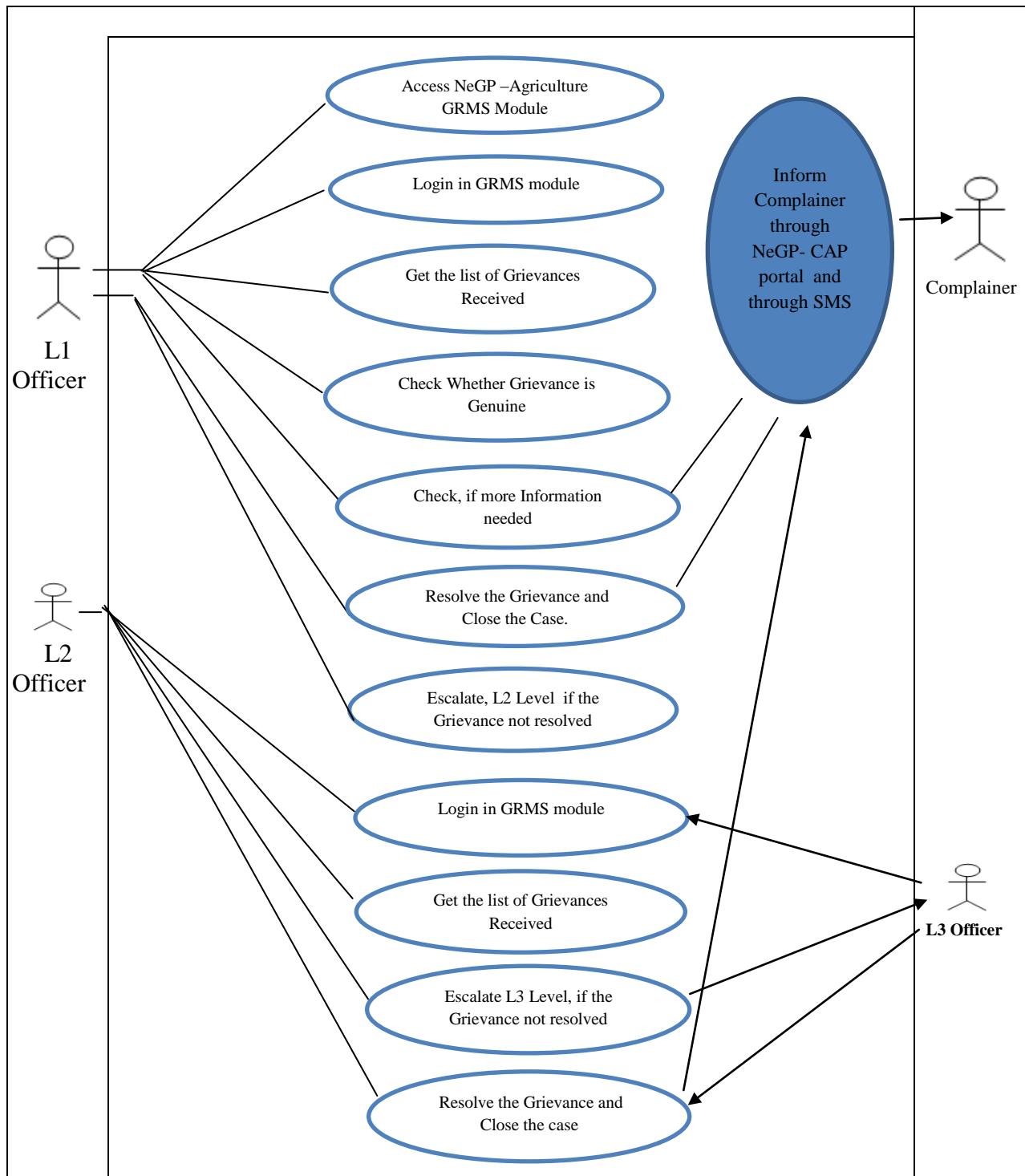
The categorization of user is on the basis of all possible activities that can be performed by the particular kind of user.

### **6.5.10.1 Use Case Diagrams: Grievance Registration and Reviewing Process**

#### **6.5.10.1.1 Use Case Diagram: Grievance Registration**



**Figure - 60: Use Case Diagram: Grievance Registration Process**



**Figure - 61: Use Case Diagram: Grievance Reviewing, Resolving and Escalating Process**

### 6.5.10.1.2 Brief Description

Figure 60 and 61 depicts use case diagrams for Grievance Registrations and Redressal Process of NeGP-Agriculture CAP portal. The steps are described below-

1. User access the GRMS Module of NeGP Central Agricultural Portal and Login if registered already.
2. If not already registered at portal, user has to fill the registration form and get user id and password for accessing the portal.
3. On Successful login, identity details of users are displayed on portal.
4. After successful login, user will be able to access NeGP-Agriculture Grievance Section.
5. User registers the complaint.
6. User will get unique Complaint Id number on portal and through SMS at user's mobile for further reference and for tracking status of the registered grievance.
7. Level1 officer Login at GRMS module.
8. Level1 Officer gets the list of complaints received.
9. Level 1 Officer will check the complaints.
10. If Complaint is genuine, he will attend the complaint otherwise he will close the case at Level1.
11. Level1 Officer Checks, in case more information is needed from the Complainant.
12. If yes, sends Message through GRMS portal or through SMS. Otherwise resolves the complaint.
13. If complaint is resolved by Level 1 officer, the status is updated at web site and system should generate SMS about the updated status to user.
14. If complaint cannot be resolved by L1 officer, he escalates the complaint to L2 officer.
15. Level2 Officer Login at GRMS module and should get list of complaints.
16. If resolved by L2 Officer, status is updated at web site and system should send SMS about the updated status to user.
17. If complaint cannot be resolved by L2 officer then he escalates the complaint to L3 Officer
18. Level 3 Officer log in at GRMS module and should get the list of complaints received.
19. Resolve the complaints and close the case.
20. Update the status at web site and system should send SMS about the updated status to user.

## 6.5.11 Use Cases for Grievance Redress and Management

### 6.5.11.1 Use Case for accessing Grievance Redress and Management

*Scope:* This activity enables the actor to access the Grievance Redress and Management Application

Use Case Field	Description	
Use Case ID:	UC_GRMS_AGRM	
Use Case Name:	Access Grievance Redress and Management Application	
Actors:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Stake Holders:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	This process relates to the access of Grievance Redress and Management Application provided on Central Agricultural Portal	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor clicks on Central Application Portal → Lodge Your Grievance</li> <li>▪ Actor send SMS to lodge grievance</li> <li>▪ Actor send e-mail to lodge grievance</li> <li>▪ Actor dial toll free number of Kisan Call Centre to lodge grievance</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Application Portal</p> <p>The Actor is either viewing the default page of the Central Agricultural Portal without Signing In to the Portal or he is registered into the central agricultural portal and signed in.</p>	
Post conditions:	Application for Grievance Management section is loaded	
Input:	Nil	
Output:	Nil	
Normal Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Lodge your Grievance” link on home page of CAP</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Grievance Management” application</li> </ul>
Alternative Flow:	<b>Actor Actions</b>	<b>System Responses</b>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>▪ Actor lodges grievance through SMS</li> <li>▪ Actor lodges grievance through IVRS</li> <li>▪ Actor lodges grievance through e-mail</li> <li>▪ User choose to cancel the current operation</li> <li>▪ User logs out</li> </ul>	<ul style="list-style-type: none"> <li>▪ Grievance lodged by sending SMS to designated mobile number with prescribed prefix with SMS will be captured by the system and stored in the database</li> <li>▪ Grievance lodged by dialing toll free number of Kissan Call Centre will be entered in the system by operator and stored in the database</li> <li>▪ Grievance lodged by sending SMS to designated e-mail address will be captured by the system and stored in the database Farmer writes the application, which is scanned and entered into the system by Agriculture officer</li> <li>▪ Exit condition Actor chooses to cancel the current operation, the system does not proceed and no data is processed. Use case ends.</li> <li>▪ Log out</li> <li>▪ Actor chooses to log out from the current operation, the interface grievance redressal disappears and no data is processed. The control goes to the portal home page. Use case ends</li> </ul>
Exceptional Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>

Use Case Field	Description
	temporarily disabled
Includes: other use case id	Use case for User registration
UI: required/not required	Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	The Central Agricultural Portal will display Labels/Help text in simple language specific to the practice so that the User does not find any difficulty in understanding the fields that are to be selected while entering a particular query.
Special Requirements:	Link can be accessed using mouse as well as keyboard
Assumptions:	The query will be routed to the State/District or Block Level from which it will be routed to the Central Level if necessary.
Dependency:	
Notes and Issues:	

#### 6.5.11.2 Use Cases for registering grievance using web based interface

*Scope: This activity enables the actor to register a grievance using web based interface*

Use Case Field	Description
Use Case ID:	UC_GRMS_RG
Use Case Name:	Entry of new grievance

Use Case Field	Description	
Actors:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	This service enables the user to enter a grievance into the system	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor selects “Lodge your Grievance” option on Home page</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal</p> <p>The Actor is either viewing the default page of the Central Agricultural Portal without logged in to the Portal.</p> <p>Actor is registered with the Central Agricultural Portal and logged in to the system</p>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Grievance ID and notifies user. Actor will receive an acknowledgement through SMS or email about their grievance.</p> <p>Grievance is marked to concerned authority (L1 officer) for addressing the issue</p> <p><b>At AF 3,4 :</b></p> <p>Home page is displayed.</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Lodge your Grievances” link on Central Agriculture Portal home page</li> <li>▪ Actor is provided with following fields for information entry           <ul style="list-style-type: none"> <li>• Language</li> <li>• Date of Complaint</li> <li>• Department (List of all relevant departments such as</li> </ul> </li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Grievance Redressal” application</li> <li>▪ If user is registered with the CAP and logged in, system pre-populates the following fields, if entered by user previously while registering -           <ul style="list-style-type: none"> <li>• Name of actor</li> <li>• Mobile number - numeric</li> </ul> </li> </ul>

Use Case Field	Description	
	<p>Agriculture, horticulture, floriculture, Livestock, Fisheries, etc is provided)</p> <ul style="list-style-type: none"> <li>• Grievance Type (List of all services seeds, pesticides, soil etc is provided)</li> <li>• When the actor does not see the intended service in the list, ‘Others’ option is selected and on selecting this, a text area for free text writing is provided where actor can enter their intended services.</li> <li>• The actor selects service type from a list option</li> <li>• The actor fills in an area specified for Summary of the Grievance that he is willing to Register under Grievance Description</li> <li>• Additional information, if not logged in and registered <ul style="list-style-type: none"> <li>• Name of actor (optional)</li> <li>• Mobile number (optional) - numeric</li> <li>• E-mail ID (optional)</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> <li>• Field to upload scan copy of hand written application, or any other document, photo, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• E-mail ID</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> <ul style="list-style-type: none"> <li>■ On selection of Submit <ul style="list-style-type: none"> <li>■ Information as entered by actor is registered in Database.</li> <li>■ Unique number assigned to the grievance for reference is displayed on screen for actor in the form “YYYYSSDDNNNNNN” where <ul style="list-style-type: none"> <li>YYYY-YEAR</li> <li>SS-State Code, Central Department Code</li> <li>DDD-District Code</li> <li>NNNNNN-06 Digit Application Number</li> </ul> </li> <li>■ Mail /SMS sent to actor with receipt for grievance and details of grievance registered. Timelines for resolution of grievance also mentioned</li> <li>■ Mail is sent to concerned authority with details for grievance and timelines assigned</li> </ul> </li> </ul>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>• Options to Submit, Exit provided</li> <li>• Actor selects submit option</li> <li>• The system proceeds to save data. Before saving following actions are performed:           <ul style="list-style-type: none"> <li>• Proper area of Grievance is chosen.</li> <li>• Grievance type is properly mentioned</li> <li>• In case “Other” option is selected, the details on this area are specified.</li> <li>• Grievance detail is not blank.</li> </ul> </li> </ul>	
Alternative Flow:	<ol style="list-style-type: none"> <li>1. Exit condition - Actor chooses to cancel the current operation, the system does not proceed and no data is processed. Use case ends.</li> <li>2. Log out - Actor chooses to log out from the current operation, the interface for grievance redressal disappears and no data is processed. The control goes to the portal home page. Use case ends.</li> </ol>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Agricultural Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor’s internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes:	Use case for accessing CAP, Use case for user registration, Use case for login	

Use Case Field	Description
other use case id	
UI: required/not required	Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>▪ The Central Agricultural Portal will display Labels/Help text in simple language specific to the practice so that the User does not find any difficulty in understanding the fields that are to be selected while entering a particular query.</li> </ul>
Special Requirements:	<p>Input can be entered in vernaculars.            The reply should be in the same language in which it will be entered.            The text of grievance is not to exceed 5000 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b>            Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b>            None.</p> <p><b><u>Uses</u></b></p> <ol style="list-style-type: none"> <li>1. Login, if the actor has logged in to the portal.</li> <li>2. Id, provided in the previous login, in case the User has already registered a Grievance.</li> </ol>
Notes and Issues:	-

### 6.5.11.3 Use Cases for registering grievance using SMS

*Scope: This activity enables the actor to register a grievance using SMS interface*

Use Case Field	Description	
Use Case ID:	UC_GRMS_RG_SMS	
Use Case Name:	Lodge grievance using SMS	
Actors:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	This service enables the user to lodge grievance using SMS	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor sends SMS to designated mobile number with prescribed prefix for lodging Grievances</li> </ul>	
Pre conditions:	<ul style="list-style-type: none"> <li>▪ The Actor is not registered with the Central Agricultural Portal.</li> <li>▪ Actor is registered with the Central Agricultural Portal.</li> </ul>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Grievance ID and notifies user. Actor will receive an acknowledgement through SMS or email about their grievance.</p> <p>Grievance is marked to concerned authority (L1 officer) for addressing the issue</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor registers with the CAP by sending SMS NeGPA REG, &lt;First Name&gt;,&lt;State Name&gt;,&lt;District Name&gt;, &lt;Block Name&gt;, &lt;Village Name&gt;</li> <li>▪ Actor sends SMS to designated mobile number with prefix</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ If user is not registered with CAP, System prompts user to register by sending SMS.</li> <li>▪ If user sends SMS for registration, system checks the format and parameters against database (State, District, Block, Village) and if proper, registers the user by saving</li> </ul>

Use Case Field	Description	
	<p>NeGPA GRM as follows –</p> <p>NAGPA GRM,&lt;Message Text&gt;</p>	<p>his information and mobile number in the database.</p> <ul style="list-style-type: none"> <li>▪ If format and parameters for registration are not proper, system sends SMS to the user to register with correct parameters and format.</li> <li>▪ If user is registered with the CAP, system captures the grievance lodged through SMS</li> <li>▪ The grievance is assigned to the respective authority</li> <li>▪ Unique number assigned to the grievance for reference in the form “YYYYSSDDDNNNNNN” where           <p style="margin-left: 20px;">YYYY-YEAR</p> <p style="margin-left: 20px;">SS-State Code, Central Department Code</p> <p style="margin-left: 20px;">DDD-District Code</p> <p style="margin-left: 20px;">NNNNNN-06 Digit Application Number</p> </li> <li>▪ Mail /SMS sent to actor with receipt for grievance and details of grievance registered. Timelines for resolution of grievance also mentioned</li> <li>▪ Mail is sent to concerned authority with details for grievance and timelines assigned</li> </ul>
Alternative Flow:	<ol style="list-style-type: none"> <li>1. User can register using IVRS, Web based interface</li> <li>2. User can lodge grievance using IVRS, web based interface, e-mail</li> </ol>	<ul style="list-style-type: none"> <li>▪ System captures the user registration information using respective Use cases</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ User sends SMS, but signal is not available</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard message for non-availability of signal</li> </ul>

Use Case Field	Description
Includes: other use case id	Use case for user registration
UI: required/not required	Not Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>■ The NeGP-Agriculture Mission Mode project will have designated mobile number for receiving grievances</li> </ul>
Special Requirements:	<p>SMS can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of grievance is not to exceed 180 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>■ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b> None</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b></p> <ol style="list-style-type: none"> <li>1. Registration details, if user is already registered for CAP</li> </ol>
Notes and Issues:	-

### 6.5.11.4 Use Cases for registering grievance using e-mail

*Scope:* This activity enables the actor to register a grievance by sending e-mail

Use Case Field	Description	
Use Case ID:	UC_GRMS_RG_email	
Use Case Name:	Lodge grievance using e-mail	
Actors:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	This service enables the user to lodge grievance using e-mail	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor sends e-mail to designated e-mail address</li> </ul>	
Pre conditions:	<ul style="list-style-type: none"> <li>▪ The Actor is not registered with the Central Agricultural Portal.</li> <li>▪ Actor is registered with the Central Agricultural Portal.</li> </ul>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Grievance ID and notifies user. Actor will receive an acknowledgement through SMS or email about their grievance.</p> <p>Grievance is marked to concerned authority (L1 officer) for addressing the issue</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor sends e-mail to designated e-mail address with designated subject for e.g. "NeGPA-GRMS" with attachments like documents, photos, images, etc.</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ If user is not registered with CAP, System prompts user to register by sending e-mail with link for user registration.</li> <li>▪ If user is registered with the CAP,</li> </ul>

Use Case Field	Description	
		<p>system captures the grievance lodged through e-mail (e-mail text as well as attachments)</p> <ul style="list-style-type: none"> <li>▪ The grievance is assigned to the respective authority based on the location details of the applicant</li> <li>▪ Unique number assigned to the grievance for reference in the form “YYYYSSDDNNNNNN” where           <ul style="list-style-type: none"> <li>YYYY-YEAR</li> <li>SS-State Code, Central Department Code</li> <li>DDD-District Code</li> <li>NNNNNN-06 Digit Application Number</li> </ul> </li> <li>▪ Mail /SMS sent to actor with receipt for grievance and details of grievance registered. Timelines for resolution of grievance also mentioned</li> <li>▪ Mail is sent to concerned authority with details for grievance and timelines assigned</li> </ul>
Alternative Flow:	1. User can lodge grievance using IVRS, web based interface, SMS	<ul style="list-style-type: none"> <li>▪ System captures the grievance using respective Use cases</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ User sends e-mail, but it bounces back</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard message for e-mail</li> </ul>
Includes: other use case id	Use case for accessing CAP, Use case for user registration, Use case for login	
UI: required/not required	Not Required	

Use Case Field	Description
Priority: Low/medium/high	High
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>■ The NeGP-Agriculture Mission Mode project will have separate e-mail address for receiving grievances</li> </ul>
Special Requirements:	<p>E-mail can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of grievance e-mail is not to exceed 500 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>■ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b> None</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b> Registration number, if user is already registered for CAP</p>
Notes and Issues:	-

### 6.5.11.5 Use Cases for registering grievance using IVRS

*Scope: This activity enables the actor to register a grievance using web based interface*

Use Case Field	Description	
Use Case ID:	UC_GRMS_RG-IVRS	
Use Case Name:	Entry of new grievance using IVRS	
Actors:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	This service enables the user to lodge a grievance into the system using IVRS	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor rings up toll free number(1800-180-1551) of Kisan Call Centre to lodge his/her grievance</li> </ul>	
Pre conditions:	Actor should have rang up the toll free number (1800-180-1551) of Kisan Call center and his call has been answered.	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system captures data from Kisan Call Centre IVRS system using web service written for it. The system processes data, data is saved into the backend database. System generates a Grievance ID and notifies user. Actor will receive an acknowledgement through SMS or email about their grievance.</p> <p>Grievance is marked to concerned authority (L1 officer) for addressing the issue</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor rings up toll free number(1800-180-1551) of Kisan Call Centre to lodge his/her grievance</li> <li>▪ Actor provides his personal</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Grievance Redressal and Management system of CAP captures the details of grievances entered in Kisan Call Centre's application system with query type</li> </ul>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>▪ details along with grievance</li> <li>▪ The operator captures the following details and enters into the Kisan Call Centre application system with user query type as GRM - <ul style="list-style-type: none"> <li>• Language</li> <li>• Date of Complaint</li> <li>• Department (List of all relevant departments such as Agriculture, horticulture, floriculture, Livestock, Fisheries, etc is provided)</li> <li>• Grievance Type (List of all services seeds, pesticides, soil etc is provided)</li> <li>• When the actor does not see the intended service in the list, 'Others' option is selected and on selecting this, a text area for free text writing is provided where actor can enter their intended services.</li> <li>• The actor selects service type from a list option</li> <li>• The actor fills in an area specified for Summary of the Grievance that he is willing to Register under Grievance Description</li> <li>• Additional information, if not logged in and registered <ul style="list-style-type: none"> <li>• Name of actor (optional)</li> <li>• Mobile number (optional) - numeric</li> <li>• E-mail ID (optional)</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ GRM using web service</li> <li>▪ User is registered with the CAP system. The following information about the user is fetched from Kisan Call Centre system - <ul style="list-style-type: none"> <li>• Name of actor</li> <li>• Mobile number - numeric</li> <li>• E-mail ID</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> </li> <li>▪ Unique number assigned to the grievance for reference and send to the Kisan Call Center application system in the form "YYYYSSDDDDNNNNNN" where <ul style="list-style-type: none"> <li>YYYY-YEAR</li> <li>SS-State Code, Central Department Code</li> <li>DDD-District Code</li> <li>NNNNNN-06 Digit Application Number</li> </ul> </li> <li>▪ Mail /SMS sent to actor with receipt for grievance and details of grievance registered.</li> <li>▪ Timelines for resolution of grievance also mentioned</li> <li>▪ Mail is sent to concerned authority with details for grievance and timelines assigned</li> </ul>

Use Case Field	Description
	<ul style="list-style-type: none"> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> <li>• The system proceeds to save data. Before saving following actions are performed:           <ul style="list-style-type: none"> <li>• Proper area of Grievance is chosen.</li> <li>• Grievance type is properly mentioned</li> <li>• In case “Other” option is selected, the details on this area are specified.</li> <li>• Grievance detail is not blank.</li> </ul> </li> </ul>
Alternative Flow:	1. Exit condition - Actor chooses to disconnect phone. Use case ends.
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Phone is busy</li> <li>▪ Phone is not picked up</li> </ul> <p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard busy ring tone</li> </ul>
Includes: other use case id	Use case for accessing CAP, Use case for user registration
UI: required/not required	Not Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/	Frequent

Use Case Field	Description
frequent/ medium/ less/ rare	
Business Rules:	<ul style="list-style-type: none"> <li>▪ Web services will be built to exchange data between Kisan Call Centre System and Grievance Redressal and Management system of CAP</li> <li>▪ Web service will pull data from Kisan Call Centre application with Query type marked as GRM. It will pull information regarding personal details as well as grievance details</li> <li>▪ Web service will push data regarding Grievance id to the Kisan Call Centre application system</li> </ul>
Special Requirements:	<p>Input can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of grievance is not to exceed 500 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b></p> <p>None</p> <p><b><u>Is Extended By</u></b></p> <p>None</p> <p><b><u>Uses</u></b></p> <p>1. Id, in case the User has already registered a Grievance.</p>
Notes and Issues:	-

### 6.5.11.6 Use Cases to view grievance list and allocate responsibility to resolve

*Scope: This activity enables the actor to view grievance list and take appropriate action*

Use Case Field	Description	
Use Case ID:	UC_GRMS-VG	
Use Case Name:	View the grievances	
Actors:	Central/State Agricultural Departments, Agricultural offices, Taluk ADA , District DDA and JDA	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers	
Description:	The grievance management process relates to the viewing the grievances fed into the system by the farmers, private sector and the government machinery.	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor receives mail for grievance</li> <li>▪ Actor access his dashboard for pending activities</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal and logged in</p> <p>Only Users authorized to receive the grievance already listed/entered in system receive it</p>	
Post conditions:	Grievance is directed to person responsible to address it	
Input:		
Output:		
Normal Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Actor views e-mail alerting him of receiving grievance</li> <li>▪ Actor clicks on the “Grievances Management” link of CAP</li> <li>▪ Actor is provided with list of grievances</li> <li>▪ Actor double clicks the grievance</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Mail /SMS sent to actor under “Responsibility” field with details of grievance registered. Timelines for resolution of grievance also mentioned</li> </ul>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>▪ in the list</li> <li>▪ Actor is provided with the following fields for information entry of the selected grievance <ul style="list-style-type: none"> <li>• Department (options of all relevant departments such as Agriculture, horticulture, floriculture etc is provided)</li> <li>• Section (options of all sections seeds, pesticides, soil etc is provided)</li> <li>• Option for <b>Others</b> is provided</li> <li>• Grievance reference number</li> <li>• Responsibility (option to select user from list). By default Name of the officer at appropriate level of the escalation matrix will be displayed. However, there will be flexibility to search and select any name from the internal user list.</li> <li>• Time frame (option to enter number of days provided)</li> <li>• Actor selects submit option</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Mail is sent to concerned authority</li> <li>▪ Mail/SMS is sent to the concerned user about the status of grievance registered by him</li> </ul>
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Application Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>

Use Case Field	Description
Includes: other use case id	Use case for login
UI: required/not required	Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	The grievances will be assigned to the officer depending on the options entered by user like department/section/state/district/block
Special Requirements:	<p>To arrange the records in ascending order or descending order of desired column</p> <p>Search and filter facility to search particular grievance based on user name, id or type of grievance.</p> <p>Facility to assign multiple grievances in the list to one officer at a time by selecting these based on the section/type.</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ Officer has privileges for necessary access</li> </ul>
Dependency:	<p><b><u>Extends</u></b>  Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b>  None.</p> <p><b><u>Uses</u></b></p> <ol style="list-style-type: none"> <li>1. Login, if the actor has logged in to the portal.</li> <li>2. Id, provided in the previous login, in case the User has already registered a Grievance.</li> </ol>
Notes and Issues:	-

### 6.5.11.7 Use Cases for resolution of grievance

*Scope: This activity enables the actor to resolve the grievance*

Use Case Field	Description	
Use Case ID:	UC_ GRMS_RLG	
Use Case Name:	Resolution of grievance	
Actors:	Central/State Agricultural Departments, Agricultural offices, Taluk ADA, District DDA and JDA	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers, concerned authority	
Description:	This service enables the actor to provide resolution for grievance	
Trigger:	<ul style="list-style-type: none"> <li>▪ Mail received from concerned authority to address grievance</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal</p> <p>Users authorized to receive the grievance already listed/entered in system</p>	
Post conditions:	Grievance resolution is updated in the system and mail is sent to actor and concerned authority with resolution	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Grievances Resolution” link on Grievance Redressal application</li> <li>▪ Actor is provided with list of grievances pending at his end</li> <li>▪ Actor double clicks the grievance in the list</li> <li>▪ following fields are displayed</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Mail /SMS sent to actor with receipt for grievance and details of grievance resolution</li> <li>▪ Mail/SMS is sent to user who has registered grievance and concerned authority with details for grievance</li> </ul>

Use Case Field	Description	
	<p>for information entry of the selected grievance</p> <ul style="list-style-type: none"> <li>• Grievance / Issue</li> <li>• Grievance reference number</li> <li>• Resolution comments</li> <li>• Option to submit</li> </ul>	and resolution
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Agricultural Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes: other use case id	Use case for Login	
UI: required/not required	Required	
Priority: Low/medium/high	High	
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent	
Business Rules:	<ul style="list-style-type: none"> <li>▪ Grievances assigned to the actor will be displayed in the dash board of the actor</li> </ul>	

Use Case Field	Description
	<ul style="list-style-type: none"> <li>▪ Actor can escalate the grievance, if it cannot be resolved at his level</li> <li>▪ If no mail id or phone number is provided by actor registering the grievance, resolution is displayed only through the user interface available on portal (user details as registered)</li> </ul>
Special Requirements:	<p>To arrange the records in ascending order or descending order of desired column</p> <p>Search and filter facility to search particular grievance based on user name, id or type of grievance.</p> <p>Facility to assign multiple grievances in the list to one officer at a time by selecting these based on the section/type.</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ Resolution matrix for grievances has been defined and necessary privileges have been granted to the user for resolving the grievances as per this matrix</li> </ul>
Dependency:	<p><b><u>Extends</u></b></p> <p>Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b></p> <p>None.</p> <p><b><u>Uses</u></b></p> <ol style="list-style-type: none"> <li>1. Login, if the actor has logged in to the portal.</li> <li>2. Id, provided in the previous login, in case the User has already registered a Grievance.</li> </ol>
Notes and Issues:	-

### 6.5.11.8 Use Cases for escalation of grievance

*Scope: This activity enables the actor to escalate a grievance*

Use Case Field	Description	
Use Case ID:	UC_ GRMS_EG	
Use Case Name:	Escalation of grievance	
Actors:	Central/State Agricultural Departments, Agricultural offices, Taluk ADA, District DDA and JDA	
Stake Holder:	Farmer / Citizen / Retailer / Dealer / Wholesaler / Exporter / Importer / NGOs / Government Officers, concerned authority	
Description:	This service enables the user to escalate a grievance in the system	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor selects Grievance Redressal option on Home page</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal</p> <p>Users authorized to receive the grievance already listed/entered in system (for escalation)</p> <p>Grievance is registered in the system</p>	
Post conditions:	Grievance is registered in the system and mail sent to actor and concerned authority for addressing the issue post escalation	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Grievances” link on Central Agriculture Portal home page</li> <li>▪ Actor selects “Grievance Escalation” option</li> <li>▪ Actor is provided with following fields for information</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Grievance Redressal” application</li> <li>▪ This option is available only when resolution cannot be provided by actor at his level</li> <li>▪ Information as entered by actor is registered in Database.</li> </ul>

Use Case Field	Description
	<p>entry</p> <ul style="list-style-type: none"> <li>• Grievance / Issue (registered earlier)</li> <li>• Grievance Reference Number</li> <li>• Comments (to enter details for escalation)</li> <li>• List of officers to select from to which grievance is to be escalated with default option set already</li> <li>• Options to Submit, Exit provided</li> <li>• Actor selects submit option</li> </ul>
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul> <p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes: other use case id	Use cases for assigning responsibility and resolution to be used
UI: required/not required	Required
Priority:	High

Use Case Field	Description
Low/medium/high	
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>▪ System should display default option for escalation of grievance to the next level officer</li> <li>▪ System should allow actor to select the next level officer.</li> <li>▪ After escalation the grievance is marked to the next level officer</li> </ul>
Special Requirements:	<p>To arrange the records in ascending order or descending order of desired column</p> <p>Search and filter facility to search particular grievance based on user name, id or type of grievance.</p> <p>Facility to assign multiple grievances in the list to one officer at a time by selecting these based on the section/type.</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ Resolution matrix for grievances has been defined and necessary privileges have been granted to the user for resolving the grievances as per this matrix</li> </ul>
Dependency:	<p><b><u>Extends</u></b> Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b> Login, if the actor has logged in to the portal. Id, provided in the previous login, in case the User has already registered a Grievance.</p>
Notes and Issues:	-

## 6.5.12 Data Entities for Grievance Redressal and Management System

Data entities for Grievance Redressal and Management System have been provided in Annexure – C under Section III Data entities for Grievance Redressal and Management.

## 6.5.13 Formats for Reports

User may be allowed to see the status application by entering Grievance Id Number in GRMS module of Central Agricultural Portal. To know the status of application user may not need to login with user id and password.

Enter Grievance Id Number:

YYYYSSDDNNNNNN

Application Id : YYYYSSDDNNNNNN	State : SSSS District Name :DDDDDD Block:BBBB
Name: AAAAAA Date Of Complaint :DD/MM/YYYY	Village Name :VVVVVV
Description of Complaint : XXXXXXXXXXXXXXXXXXXXXXXXXX BBBB BBBB BBBB BBBB	
JJJJJJ	
Status : Solved/Pending	
Remark by officer :      UUUUUU UUUU YYYYYYYYYY UUUU	
Officer Name : JKJKJK Date:DD/MM/YYYY	Office Address : hhhhhh tt uuuuuu ii

### 6.5.13.1 Report formats for monitoring

System will have facility to generate reports used by Central Department, State, and District Administration for Monitoring purpose.

1. Separate Reports for Number of cases pending District Wise / Block Wise / Village Panchayat Wise / Village Wise.
2. List of Officers and Office Heads (District Wise / Block Wise) – Not attending the cases timely. – Calculation based on Number of Cases pending at their end.
3. List of Villages → Block Wise, with number of cases are pending. The selection may be like this :-

Select State : AAAA

Select District : DDDD

Select Tahsil: TTTT

Select Block: BBBBB

List of Village Panchayat Names in that particular Block will be displayed

Village Panchayat Name	No. of Cases Pending
AAAA	90
TTTT	67
RRRR	67

Clicking Village Panchayat → list of villages with number of cases pending against each village will be displayed.

Village Name AAAAAA	No. of Cases Pending in each Village
CCCC	10
RTRT	80

On clicking on village name say CCCC all 10 application should be listed with brief description to know the basic details.

#### 4. List of Officers / Office Names

Admin Login with user id and password

Select State: SSSSS

Select District: DDDDD

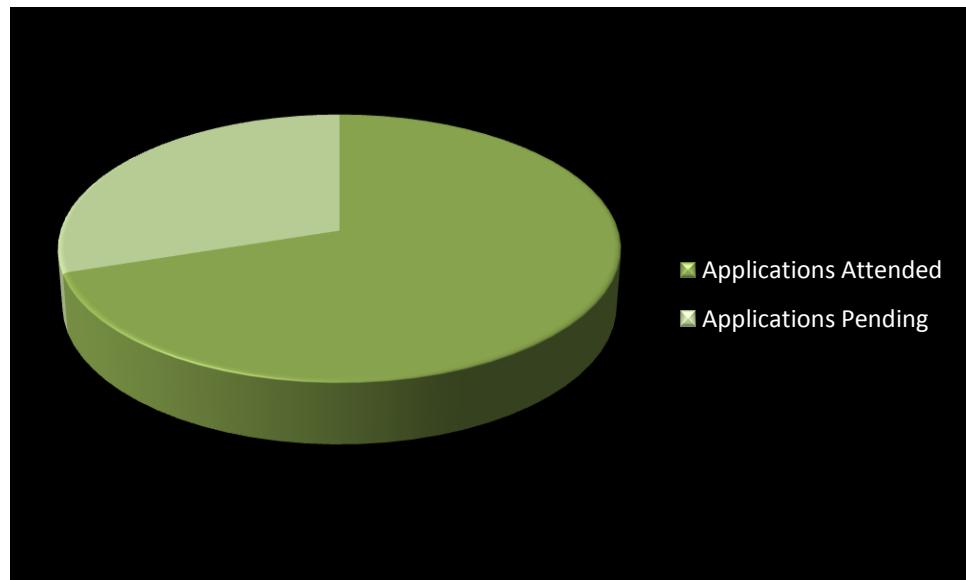
Select Tehsil: TTTTTT

Select Block: BBBBB

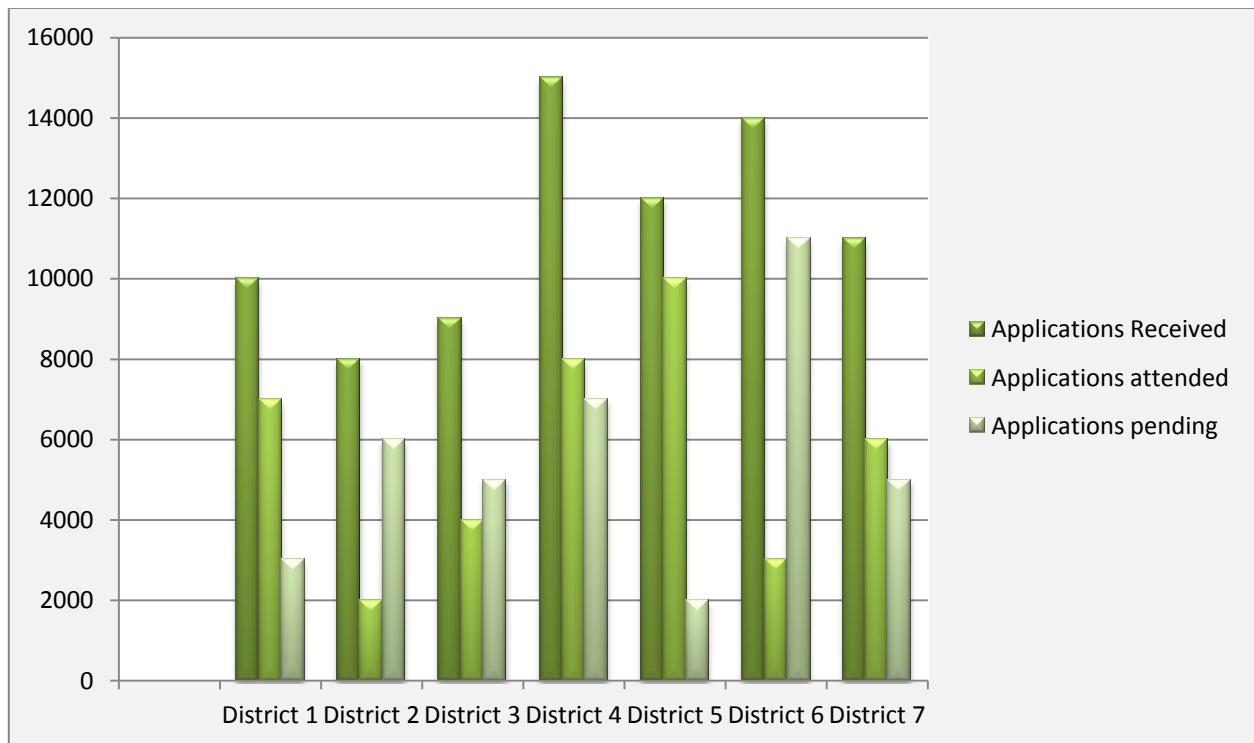
Officer Name	Office Address	No of Cases Pending
WWWW	YUYUUUUU	10
TTTT	HHHH	78
EEEE	OPOPP	66

On clicking on officer Name or pending cases number. List of pending cases with date should come.

## 5. Generation of Dynamic Charts



**Figure - 62: Pie chart for applications attended and applications pending with state/district/block**



**Figure - 63: Chart : District-wise applications received, attended, pending**

### **6.5.14 Layouts for Grievance Redressal Management System**

Link for Grievance Redressal Management System will be provided on the Home Page of the Central Agricultural Portal as “Lodge your Grievance”. After clicking this link, the following Screen for the Grievance Redressal Management System, will be displayed for the user to register a Grievance. A Dropdown Menu will be displayed, showing the Grievance Type. The User can then select the grievance type as Crop related, Seed related, Pesticides related, Bank related etc.

**Figure - 64: GRMS - Register Grievance Screen**

On selecting the Grievance type, a box for Grievance Summary will be displayed. The User can fill in a summary of the Grievance to be registered in this box.

The screenshot shows the NeGP-AMMP portal interface. At the top, there is a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, etc.), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation menu includes links for Crops (Rice, Wheat, etc.), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension), and agro-meteorological services (Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation). A sidebar on the left lists "Grievance Management" sub-links: Register Grievance, Upload Grievance, Search Grievance, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Apply Online, and Download Forms. The main content area displays the "Register Grievance - Citizen's Grievance Details" form. It has a dropdown menu for "Grievances type" set to "Crop Related" and a text area for "Grievance Summary". A "Next" button is visible at the bottom right of the form. At the bottom of the page, there is a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "GO" button. The footer also contains the NeGP logo, a statement about demo text, and a design credit to NIC (National Informatics Centre) with their logo.

**Figure - 65: GRMS – Select Grievance Type**

The details of the User will be displayed on the next screen along with the Grievance. The details consist of the Name, Address, Mobile No., Pin Code and email of the User as provided during User Registration. The User will not be required to fill in these details again. The fields will be automatically picked up as the user logs in and will be displayed on registering the grievance.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the Indian national emblem, the text "Select Language" followed by links for various Indian languages, and accessibility options like "Font Size A A A". Below the header is the NeGP logo and the text "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation menu includes links for "CROPS", "MY AGRI", "FARMING", "MARKETING", "SERVICES", and "INFORMATION". On the left, a sidebar lists "Grievance Management" sub-links: "Register Grievance", "Upload Grievance", "Search Grievance", "Farmer's Corner", "Industry Corner", "National Farmer's Database", "Expert Advisory System", "Knowledge Management", "Apply Online", and "Download Forms". The main content area displays a form titled "Preview Grievance - Citizen's Grievance Details". It has two sections: "Personal Details" and "Grievance Details". In "Personal Details", fields include Name (Mr. ABC XYZ), Address (ABC xxxxx ZYX), Pin code (1100XX), Email (abcxxxx@zyx.com), and Mobile No. (98365xxxx). In "Grievance Details", fields include Grievances type (Crop Related) and a large text area for Grievance Summary containing placeholder text about the grievance. A "Submit" button is at the bottom of the form. At the bottom of the page, there is a footer with links for "About this Portal", "Help", "Terms of Use", "Visitor Summary", "Newsletter", "Your Opinion!", "Related Links", and "Accessibility Statement". The footer also features the NeGP logo, a statement about the site being designed by NIC, and the NIC logo.

**Figure - 66: GRMS - Preview Grievance**

Once the Grievance is registered, the user will be provided with a Grievance no. as well as the Date and Time of the issue of Grievance receipt.

**Figure - 67: GRMS – Acknowledgement and Grievance number assignment**

In the second scenario, the User has an option to upload the Grievance. The user will be able to select the Grievance type for e.g., Crop related, Seed related or Bank related.



Select Language [Hindi](#) | [Assamese](#) | [Kannada](#) | [Malyalam](#) | [Marathi](#) | [Bengali](#) | [Bodo](#) | [Dogri](#) | [English](#) | [Gujrati](#) | [Kashmiri](#)  
[Konkani](#) | [Maithali](#) | [Manipuri](#) | [Nepali](#) | [Oriya](#) | [Punjabi](#) | [Santhali](#) | [Sindhi](#) | [Tamil](#) | [Telgu](#)

Accessibility Options | Site Map | Add to Favourite | Tell a Friend | RSS | Select Theme | Font Size



# NoGP AGRICULTURE EMPOWERING FARMERS



Ministry of Agriculture  
Government of India



CUSTOMIZE | MY AGRI

Login  Password  Login

Crops :: [Rice](#) | [Wheat](#) | [Cashewnuts](#) | [Cotton](#) | [Jute](#) | [Banana](#) | [Grapes](#) | [Orange](#) | [Pine Apple](#) | more...

Seed Pesticides Fertilisers Soil Health Irrigation Farm Machinery Crop Livestock Fisheries Training & Extension

Good Agricultural Practices (GAPs) Prices and Arrivals e-Market Procurement Points Marketing Infrastructure Exports and Imports Weather and Agro-met advisory Drought Relief and Management Monitoring Implementation

Home > Grievance Management > Upload Grievance SEARCH BOX

- [:: Grievance Management](#)
- [:: Register Grievance](#)
- [:: Upload Grievance](#)
- [:: Search Grievance](#)
- [:: Farmer's Corner](#)
- [:: Industry Corner](#)
- [:: National Farmer's Database](#)
- [:: Expert Advisory System](#)
- [:: Knowledge Management](#)
- [:: Apply Online](#)
- [:: Download Forms](#)

Upload Grievance - Citizen's Grievance Details

Grievances type:

**-Governance Project :** [AGMARKNET](#) | [DACNET](#) | [Agricultural Census](#) | [Seednet](#) | [Nav Krishi](#) | [RKVY](#) | [MMA](#)

About this Portal | Help | Terms of Use | Visitor Summary | Newsletter | Your Opinion! | Related Links | Accessibility Statement

Some demo text about this portal. Some demo text about this portal.

The site is designed by "National Informatics Centre, Ministry of Communications and Information Technology, Government of India"

## Figure - 68: GRMS - Upload Grievance – Select Grievance Type

Once the User has selected the Grievance Type, he or she will be able to upload any document relating to the particular Grievance.

The screenshot shows the NeGP-AMMP portal interface. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, etc.), and accessibility options. Below the header is the NeGP logo and the text 'Department of Agriculture & cooperation Ministry of Agriculture Government of India'. The main navigation menu includes 'CROPS', 'MY AGRI', 'GRIEVANCE MANAGEMENT', 'FARMER'S CORNER', 'INDUSTRY CORNER', 'NATIONAL FARMER'S DATABASE', 'EXPERT ADVISORY SYSTEM', 'KNOWLEDGE MANAGEMENT', 'APPLY ONLINE', and 'DOWNLOAD FORMS'. The 'GRIEVANCE MANAGEMENT' menu is currently active. On the right, there's a search bar and a 'GO' button. The main content area is titled 'Upload Grievance - Citizen's Grievance Details'. It features a dropdown menu for 'Grievances type' (set to 'Crop Related'), an 'Upload' button, and a 'Next' button. At the bottom of the page, there's a footer with links to various government databases like AGMARKNET, DACNET, and Agricultural Census, along with a 'Governance Project' section and a note from NIC.

**Figure - 69: GRMS – Upload Grievance**

Similar as in case of registering the Grievance, the personal details of the user, i.e., Name, Address, Pin Code, Mobile No. and email will be displayed along with the Grievance Type and Summary.

The screenshot displays the NeGP-AMMP portal interface. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), accessibility options, and a font size selector. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation menu includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search box. On the left, a sidebar lists categories like Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Apply Online, and Download Forms. The central content area shows the 'Upload Grievance - Citizen's Grievance Details' form. It has two sections: 'Personal Details' (Name: Mr. ABC XYZ, Address: ABC xxxx ZYX, Pin code: 1100XX, Email: abcxxxx@zyx.com, Mobile No: 98365xxxxx) and 'Grievance Details' (Grievances type: Crop Related, Grievance Summary: DocName.docx). A 'Submit' button is at the bottom of the form. At the bottom of the page, there's a footer with links to AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and other portal links. It also includes a statement about demo text, information about the site's design by NIC, and the NIC logo.

**Figure - 70: GRMS - Upload Grievance - Preview**

Finally, a Screen for Grievance Details will be displayed with the Grievance no. and date and time of uploading.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the Indian national emblem, a 'Select Language' dropdown, and links for Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, and Telgu. Below this are links for Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, and Font Size.

The main header features the 'NeGP AGRICULTURE EMPOWERING FARMERS' logo and the text 'Department of Agriculture & cooperation Ministry of Agriculture Government of India'. The background of the header is a scenic image of a field with trees and a person in the distance.

The navigation bar below includes links for CUSTOMIZE, MY AGRI, Login, and Password, followed by a 'Login' button. A 'Crops ::' dropdown menu lists Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, and more... with corresponding icons. Below this are various agricultural service links: Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fishries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, and Monitoring Implementation.

The main content area shows the 'Home > Grievance Management > Upload Grievance' path. On the right is a 'SEARCH BOX' with a 'GO' button. The central panel displays a message: 'Citizen's Grievance Details' with 'G No. Generated Successfully : 9110xxxxxx', 'Date / time : 24/12/2011 10:35:45', and a note 'Please note down this Grievance Number for Future Reference'. A 'Close' button is at the bottom of this panel.

The left sidebar contains a vertical list of links under 'Grievance Management': Register Grievance, Upload Grievance (highlighted in green), Search Grievance, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Apply Online, and Download Forms.

At the bottom, there is a footer section with links for About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, and Accessibility Statement. It also features the NeGP logo and a message about the governance project. The footer ends with a statement: 'The site is designed by "National Informatics Centre, Ministry of Communications and Information Technology, Government of India"' and the NIC logo.

**Figure - 71: GRMS - Upload Grievance – Acknowledgment and assignment of registration number**

An option will be provided to Search a particular grievance that has earlier been registered or uploaded, in order to know the status of the Grievance. The Grievance can be selected from a Dropdown Menu on the basis of State, District or Grievance No.

The screenshot shows the NeGP-AMMP portal interface. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), and accessibility options like Site Map, Add to Favourite, RSS, Select Theme, and Font Size.

The main header features the NeGP logo ('NéGP AGRICULTURE EMPOWERING FARMERS') and the text 'Department of Agriculture & cooperation Ministry of Agriculture Government of India'. Below the header is a banner with a cow and a person in a field.

The navigation bar includes links for CUSTOMIZE, MY AGRI, Login, and Password, along with a search bar labeled 'SEARCH BOX' and a 'GO' button.

The main content area has a sidebar on the left with links for Grievance Management (Register Grievance, Upload Grievance, Search Grievance, etc.), Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Apply Online, and Download Forms.

The central part of the screen is titled 'Search Grievance' and shows a dropdown menu for 'Grievances type' with options: Select One, Crop Related, Seed Related, and Bank Related.

At the bottom, there's a footer with links for -Governance Project, AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various portal policies. It also includes the NeGP logo and a note about demo text. The footer ends with a NIC logo and a statement about the site being designed by NIC.

**Figure - 72: GRMS - Search Grievance Screen – by Grievance Type**

The User can select the particular option and enter the details in the box provided in order to search for the particular grievance.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the Indian national emblem, a language selection menu (Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), and accessibility options. Below the header is the NeGP logo and the text "Department of Agriculture & cooperation Ministry of Agriculture Government of India". The main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fishries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search bar labeled "SEARCH BOX" with a "GO" button. On the left, a sidebar lists "Grievance Management" options: Register Grievance, Upload Grievance, Search Grievance (which is highlighted in green), Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Apply Online, and Download Forms. The main content area is titled "Search Grievance" and contains a search form with "Search by : Grievance No." and a "Submit" button. At the bottom, there is a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "Governance Project" section. It also includes a statement about the portal's design by NIC and a copyright notice for the National Informatics Centre.

**Figure - 73: GRMS – Search Grievance – by Grievance Number**

The Search Result of the Grievance in then displayed on the basis of the Grievance No., Name, Mobile No. and the Date on which the Grievance was created.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there's a green header bar with the Indian national emblem, a 'Select Language' dropdown, and links for Hindi, Assamese, Kannada, Malyalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithali, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, and Telugu. Below this is a banner for the Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, featuring a cow and a person in a field. The main navigation bar includes 'CUSTOMIZE' and 'MY AGRI' on the left, and 'Login' and 'Logout' on the right. A menu bar below has categories like Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension), and market-related services (Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation). The main content area shows a breadcrumb path 'Home > Grievance Management > Search Grievance' and a 'SEARCH BOX' with a 'GO' button. On the left, a sidebar lists 'Grievance Management' (Register Grievance, Upload Grievance, Search Grievance - highlighted in green), 'Farmer's Corner', 'Industry Corner', 'National Farmer's Database', 'Expert Advisory System', 'Knowledge Management', 'Apply Online', and 'Download Forms'. The central search results table has columns for G. No. (9011xxxxxxxx), Name (Abc XYZ), Mobile No. (9899xxxxxx), and Created Date (11/10/2011). At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various portal links. It also includes a statement about being designed by NIC and the National Informatics Centre logo.

**Figure - 74: GRMS – Search Results**

## 7 Expert Advisory System

The expert advisory process relates to the advice sought by the farmers directly from subject matter experts at the State and National level, with respect to their agricultural related queries.

With increasing level of education and awareness as well as availability of multiple choices for farm inputs, pesticides, herbicides, high yielding varieties of seeds, farmers today are willing to experiment with new techniques, crops and varieties. For this they need guidance and advice from the experts. Similarly various types of advisories are needed by Livestock and Fish farmers as well for livestock management and fisheries respectively. The expert advice may be needed during the entire crop cycle in normal circumstances as well as during adverse climatic conditions like drought, floods etc. They may need advises regarding pest attacks, animal diseases, processing and marketing of their produce, etc. The expert advisory should be location specific and up-to-date.

Though there are mechanisms available for providing expert advisories to the farmers through the extension services from both DAC and ICAR, these are not adequate due to various reasons like lack of sufficient manpower, tools etc. These mechanisms need to be unified and augmented with ICT tools so that expert advisories are available to the farmers timely in their language through various delivery channels available in their vicinity. Also the platform should be available to the experts to provide their advices timely and correctly. Web based Expert Advisory System developed using ICT tools along with various delivery channels like web, e-mail, IVRS, mobile phones, KVKs, CSCs, etc. can bring experts and farmers together. It can be helpful in narrowing time gap between seeking the advice by the farmer and its deliverance by expert.

The farm advisory services useful to various group of farmers as compiled by Dr. Natarajan, NBSSLUP, ICAR and further enriched by state department officers and NIC state coordinators have been listed here -

### 7.1 Farm advisory services needed by Crop, Livestock and Fisheries farmers

#### 7.1.1 Crop cultivators

1	Advisories based on weather events: rainfall event, dry spell events and humidity with wind speed. These will help crop cultivators to plan land preparation, sowing and other agricultural operations
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2	Advisories focused at pest/disease incidence based on weather analysis (prevalence of high humidity, high temperature or cloudy conditions) will help high value crop cultivators like Grape farmers.
3	Endemic diseases and pests in the region and their control
4	Type of government schemes, subsidies, credit and insurance facilities available for different category of farmers, crops etc
5	Input availability for different crops and their cost etc (fertilizers, seeds, pesticides, availability of farm machines and tools etc)
6	Soil information: soil type, depth, water holding capacity, organic matter content, slope, drainage, texture, nutrient content/deficiency(Macro and micro), suitability for various crops/enterprises, conservation needs
7	Irrigation facility: ground water quantity and quality, water harvesting advisory, best method of irrigations for the region and the crops grown
8	Market information for local crops and local markets
9	Crop/post harvest processing facilities
10	Crop specific sequence of operations and advisory requirements: Soil and climatic suitability, Varieties/hybrids availability, Land preparation needs Sowing and crop geometry (time specific) Irrigation schedule, Weed control measures, Intercropping possibilities/compatible inter crops Fertilizer and cattle manure needs and management, Insects, pests and their control Diseases and their control Special management needs (like pruning, growth hormone use etc). Harvesting and post harvest processing, packing etc. Post harvest techniques -(storage, pest techniques, marketing) Soil genesis and health indicators (physical, Chemical, biological) soil specific recommended crops Innovative technologies, non cash inputs, best management practices
11	Information/recommendations on Organic Farming and its advantages
12	Important points farmers must take care of while importing/ exporting agricultural commodities
13	Drought Symptoms and information on actions taken by Government to counter drought
14	Drought relief related information
15	Site locations of success stories which other interested farmers can visit and learn

## 7.1.2 Advisory Services required by the Livestock Farming Community

<b>From the Animal Husbandry Department</b>	<b>From the Research Organizations</b>
Availability of various govt. Schemes for the benefit of various category of farmers	
Veterinary First Aid details	Cost Effective- Economic feed formulations for Livestock and Poultry.
Forecasting - seasonal Livestock and Poultry disease outbreaks	Any new inventions pertaining to the management of Livestock and Poultry
Disease Surveillance details	Availability of New Vaccines for prevention of contagious diseases
Precautions and Preventive measures to be taken during the outbreak of contagious diseases	Vaccination Field trials being organized at the Village or Farm level
Special precautions required to be taken on the face of outbreak of Zoonotic Diseases. (Diseases transmitted from animals to humans)	Interesting findings in the feeding trials aimed at enhancing productivity and production among Livestock and Poultry.
Livestock Management Tips for - <ul style="list-style-type: none"> <li>• <i>Calf Management</i></li> <li>• <i>Housing Management</i></li> <li>• <i>Feeding Management</i></li> <li>• <i>Breeding Management</i></li> <li>• <i>Health Management</i></li> <li>• <i>Waste Management</i></li> <li>• <i>Farming Management</i></li> <li>• <i>Marketing Management</i></li> </ul>	Invention of New Breeds/ Cross Breeds focused on enhancing productivity and production among Livestock and Poultry.
Local retail and Wholesale market prices for Live Livestock, Produces and Products.	Suitability different types of livestock and poultry for and Under different Agro climatic conditions.
Storage Management Tips for Livestock Produces and Products.	Innovative processing techniques details for livestock and poultry.
Project Reports with Housing Plans with Economics-Unit Costs, Recurring and Non-Recurring Costs with repayment schedules (if advances/Loans are to be raised,) depicting Economic Viability.	Value chain inventions for Livestock Produces and Products.
Approved Simple Processing Techniques for	Special trainings organized by the Research

Livestock, Produces.	Organizations focused on livestock and Poultry Management.
Project Reports with Building Plan for establishing Processing Plants of different capacities for Sheep, Goats, Rabbits and Poultry.	Availability of Veterinary Diagnostic Facilities.
Directory of availability of different inputs like Feed, Fodder-root slips and seeds, feed supplements, Medicines, etc for livestock and Poultry Management.	New varieties of improved fodder and their package and practices for production.
Veterinary Services - availability details of Government and Private Practitioners.	Innovative measures and technologies for Fodder production, conservation with plan and project costs.
Availability details for Veterinary Diagnostic Laboratory Services of Government and Private Practitioners.	Innovative methods of management techniques, which includes-Housing and rising technology.
Availability of Veterinary Emergency Services details of Government and Private Practitioners.	Innovative and Improved farming Economics and Integrated Farming Systems.
List of Livestock Markets- both recognized and Un-recognized but Popular Markets.	
List of Name and Address with Contact Number of Veterinary Practitioners.	
List of Cattle shows being organized in the state in different places - recognized by the Government.	
Availability of Livestock Extension Materials-Books on management of Livestock and poultry.	
Mass Vaccination Programme details	
Livestock Insurance Details	
Breed details and Source of livestock and poultry	
Detailed information on Frozen Semen and availability	
Services rendered by the department and its institutions (Citizen charter for each type of institution)	
Details of farms (livestock and poultry) in the	

State under Animal Husbandry Department	
Details of Training Centers, where farmers can get training on various animal husbandry practices	
Details of laboratory facilities available with the Department	
Selling price of farm products	
Availability of inputs necessary for farmers	
Package of practices for various species of animals for scientific management.- Cattle, Buffalo, Goat, Pig, Rabbit, Poultry, Duck with various types of management like calf management, housing management, feeding management, breeding management, disease management, waste management, disaster management etc	
Vaccination schedule for different animals and availability of vaccines	
Details of schemes implemented by the Department - Both Central and State schemes	
Details of various breeds of livestock and poultry	
Details of major diseases in animals and birds	
Details of animal check posts, cattle markets	
Details of slaughter houses	
Statistical data - production of milk, meat, egg, Livestock census	
Animal Birth Control Programme - Stray dog management	
Procedure for getting license for animal husbandry practices	
Success storey sites which other interested farmers can visit &learn	
<ul style="list-style-type: none"> <li>• Disposal of dead animals (whom to contact/how it has to be disposed) biologically</li> <li>• Cruelty against animals (whom to contact)</li> </ul>	<ul style="list-style-type: none"> <li>• Screening procedures of diseases</li> <li>• Toxic plants state wise</li> <li>• Package of Practices [Major points – Breeding/Feeding/House Management of Cattle / Goat /</li> </ul>

<ul style="list-style-type: none"> <li>• Information about cattle markets, slaughter houses, Resource mapping, cattle movement tracks (animal check posts) ( to control diseases) etc. to be made available</li> <li>• Details of district-wise modernized model farms (Scientifically kept farm) and details of ideal farmers</li> <li>• Breeder's information, Disaster Management</li> <li>• How to apply for a scheme</li> <li>• Metrological aspects, SPC(Statistical *Process Control rules/ Elephant rules</li> <li>• List of registered practitioners (doctors) at government &amp; private sectors</li> <li>• District-wise vaccination scheduling in animals &amp; poultry</li> </ul>	<ul style="list-style-type: none"> <li>buffalo / Pig / Rabbit / Poultry / Duck]</li> <li>• Breeder's information, Disaster Management</li> <li>• ABC programme, How to patent a new innovation [whom to approach and what has to be done] made by a farmer</li> <li>• Epidemic pattern (seasonal outbreak of diseases) of animals and poultry</li> <li>• Rabies control</li> </ul>
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Note:

1. Livestock: Include both Large and Small Ruminants-( LR-Cattle, Buffaloes,-SR-Sheep and Goats)
2. Other livestock-Domesticated Rabbits.

Inputs include- Fodder root slips & seeds, Feed, Equipments, and medicines including feed supplements.

### 7.1.3 Advisory services needed for inland fisheries farmers

1	Soil quality parameters for taking up the enterprises: soil pH, total alkalinity, water retention quality (textural properties and plasticity etc), lime requirements.
2	<b>Water Quality Data:</b> The water supplied to the fish ponds must not contain pollutants and toxic substances detrimental to fish life. The composition of the feed water should be subject to quality analysis, including the following: <ul style="list-style-type: none"> <li>- oxygen content</li> <li>- pH value</li> <li>- total salts content</li> </ul>

	<ul style="list-style-type: none"> <li>- ammonia content</li> <li>- free CO<sub>2</sub> content</li> <li>- phenols, oil and tar content</li> <li>- Alkalinity</li> </ul> <p>The water quality analyses should be such as to enable prediction of the interactions between the soil and the feed water.</p>
3	Ground water availability (quantity)
4	Seed material availability: Type(breed), time, quantity and place of availability
5	Weather parameters: *temperature, rain fall characteristics@
6	Production cost and profit(different breeds and seasons)
7	Feeding details: schedule, cost, and type of feed for different stages of fishes and different types of fish breeds.
8	Sequence of operations in different types of fishes.
9	Market information
10	Type of government schemes, subsidies, credit facilities, insurance available for different category of farmers.
11	Site Locations of Success stories which other interested farmers can visit and learn
12	Fish Diseases, treatment and preventive measures
13	The Guidelines on Good Management Practices (GMP)
14	Technology for handling harvesting, post harvesting and processing Technology for better yield - Production Technology used for fishing operation, export and import
15	Hatcheries and Nurseries Management Needs – How to do? <ul style="list-style-type: none"> <li>• Brood stocking?</li> <li>• Produce seeds?</li> <li>• Seed rearing?</li> <li>• Packing of seeds for distributing to farmers?</li> <li>• What type of training? How to do?</li> </ul>
16	Farm management - Farmer needs How to do? <ul style="list-style-type: none"> <li>• Site selection, Prepare pond (water bodies ) for fish farming</li> <li>• Seed stocking (after receiving from hatcheries and before release into the water bodies)</li> <li>• Feed fingerlings, fishes</li> <li>• Water treatment, disease treatment</li> </ul>

	<ul style="list-style-type: none"> <li>• Harvesting, post harvesting</li> <li>• Marketing - How, where, when</li> </ul>
17	<p>Critical issues in shrimp farming, mussel farming etc - How to do and improve?</p> <ul style="list-style-type: none"> <li>❖ Production loss due to disease</li> <li>❖ Potential conflicts with other users of aquatic resources</li> <li>❖ Food safety &amp; aquatic animal health</li> <li>❖ Environmental impact due to aquaculture farm waste water</li> <li>❖ Conversion of other land categories for aquaculture</li> <li>❖ Introduction of alien &amp; genetically altered organisms</li> <li>❖ Code of practises for fish culture, shrimp farming etc.</li> <li>❖ Guidelines for regulating coastal aquaculture ( list)</li> </ul>
18	<p>Guidelines for regulating coastal aquaculture (contd.)</p> <ul style="list-style-type: none"> <li>• Environment maintaining &amp; management plan</li> <li>• Cluster management</li> <li>• Record maintenance</li> <li>• Protecting the livelihood of coastal communities</li> </ul>
19	Input availability and their cost etc

Note - \* Temperature decides which breed to be used.

@ Rainfall decides dissolved oxygen levels.

## 7.2 Existing Systems

Department of Agriculture and Cooperation has launched the Kisan Call Centre scheme from 21.1.04 to provide expert advice to farmers. The Call Centres can be accessed by farmers all over the country on common Toll Free Number 1551 to get expert advice. The objective of Kisan Call Centre is to leverage the extensive telecom infrastructure available in the country to develop Agriculture extension services.

The calls are received at 13 Call Centres wherein 116 Agriculture Graduates attend to answer the query of the farmer in the local language. 123 experts located in different parts of the country at State Agriculture Universities, ICAR institutes, State Department of Agriculture, Horticulture and other developments are answering the calls at Level –II. Thus KCC enables farmers to have direct discussions with the subject matter experts who are able to analyze the problem effectively and provide the solution directly.

The MIS software captures callers' details and specifications of the query which helps in analysing area-wise and crop-wise details within a time space framework and provides preventive, advance action solutions.

A call centre based extension service will be delivering knowledge and information exactly as per the requirements of the farming community. This system would also help keep a record of what is being delivered to the farmers in terms of knowledge and information. The Kisan Call Centre scheme is available over the complete country.

Expert Advisory System being developed under NeGP-Agriculture will have linkage with this system. Information will be shared using web services. The scope of Expert Advisory System developed under NeGP-Agriculture is wider and will be able to provide expert advisories through various delivery channels like web based interface, e-mail, mobile phones (SMS), etc apart from telephone calls.

### **7.3 Proposed System**

The Expert Advisory System proposed under NeGP-Agriculture Mission Mode Project will have facility to post their queries by farmers(Crop, Livestock and Fish farmers) using SMS, IVRS, e-mail or web based interface. Web based interface will further be available to the farmers in their vicinity through various delivery channels like Common Service Centers(CSCs), Krishi Vigyan Kendras (KVKs), etc. The queries posted using any channels will be captured centrally and forwarded to the L1 expert authorized to answer these queries. Facility will be provided to post the query in local language. If farmer is registered, his details will be displayed by the system automatically, otherwise some basic information necessary for the registration will be asked. Farmer will be assigned the unique Reference Number for future reference and accessing status of his query. All the queries marked to L1 expert will be displayed to him once he logs in the system and access his dashboard. L1 Expert will answer the query or forward it to the L2 expert. All the queries marked to L2 expert will be displayed to him once he logs in the system and access his dashboard. L2 Expert will answer the query or forward it to the L3 expert. All the queries marked to L3 expert will be displayed to him once he logs in the system and access his dashboard. L3 Expert will answer the query. As query will flow, the farmer will get status of his query and expert advice, once it is answered at some level.

Once the query is answered, it will be added in the Frequently Asked Questions (FAQs) of the system and available to all.

### 7.3.1 Process Flow of the Proposed Expert Advisory System

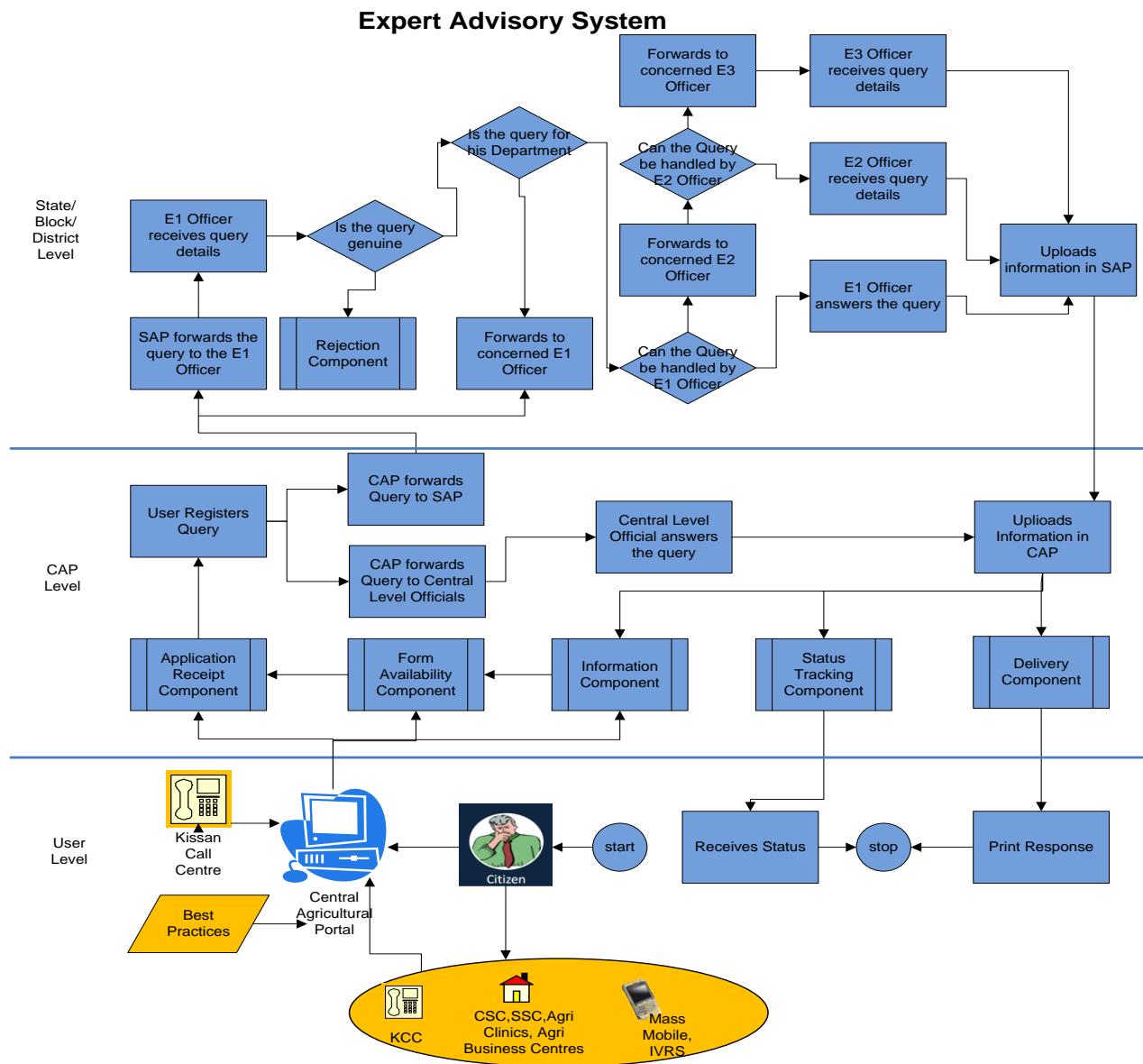


Figure - 75: Expert Advisory System – Process flow

## 7.3.2 Expert Advisory System – Functional Requirements

### Module: Expert Advisory System

**Objective:** In the proposed solution it is envisaged that the farmers would be able to directly direct their personalized queries within the departmental and attached setup of agricultural universities through an online platform, which would enable them to get an answer to their queries through agricultural experts. To enable this, an expert advice module is envisaged that would collect, process and disseminate information based on the need of the farmer.

### Functionalities:

- EA-FR1. The system shall provide the user with a list of frequently asked queries
- EA-FR2. The system shall allow the user to enter their query
- EA-FR3. The system shall allow the user to submit the query online
- EA-FR4. The system shall allow the user to enter the data, alphanumeric and special characters
- EA-FR5. The system shall prompt the user before submitting the query
- EA-FR6. The system shall prompt the user in case of any error
- EA-FR7. The system shall prompt the user in case the word limit has been exceeded
- EA-FR8. The system will provide the user with text formatting tools along with spell check option
- EA-FR9. The system shall generate a unique reference number for the submitted query
- EA-FR10. The system shall route the query based on the workflow matrix
- EA-FR11. The system shall escalate the query to the next level officer in case SLA has not been met
- EA-FR12. The system shall allow the officer to accept / re-route / reject query (as applicable)
- EA-FR13. The system shall allow the officers to enter description in case of rejection /re-routing
- EA-FR14. The system shall allow the user to reply to the query with a digital signature
- EA-FR15. The system shall allow the officer to sought more data from the applicant
- EA-FR16. The system shall allow the officer to close the query after adequate action
- EA-FR17. The system shall allow the applicant to view the response of experts
- EA-FR18. The system shall allow the applicant to re-open the query
- EA-FR19. The system shall allow the user to track the application using the reference number

- EA-FR20. The system shall display the current status of the application to the user  
 EA-FR21. The system shall generate a history of queries that have been asked by the user before  
 EA-FR22. The system prompt the user to select from frequently asked questions by other farmers

Input Format	Description
<b>Application Name</b>	Alphabetical characters, up to a limit of 50
<b>Query Description</b>	Alpha-numeric characters, up to a limit of 5000
<b>Applicable Division / Respondent</b>	Alphabetical characters, up to a limit of 50
<b>Applicant Address</b>	Alphabetical characters, up to a limit of 50
<b>Application Contact Details</b>	Alphabetical characters, up to a limit of 50
<b>EA Reference Number</b>	As per the reference number generated by the application
Output Format	Description
<b>Successful submission</b>	Acknowledgement of successful submission
<b>Unsuccessful submission</b>	Reason for unsuccessful submission
<b>Successful deletion</b>	Acknowledgement of successful deletion
<b>Unsuccessful deletion</b>	Reason for unsuccessful deletion
<b>Successful edition</b>	Acknowledgement of successful edition
<b>Unsuccessful edition</b>	Reason for unsuccessful edition
<b>Routing Application</b>	As per the escalation matrix / preference of the respondent
<b>Technical error</b>	Reason for technical error

### 7.3.3 Use Case Diagram for Expert Advisory System

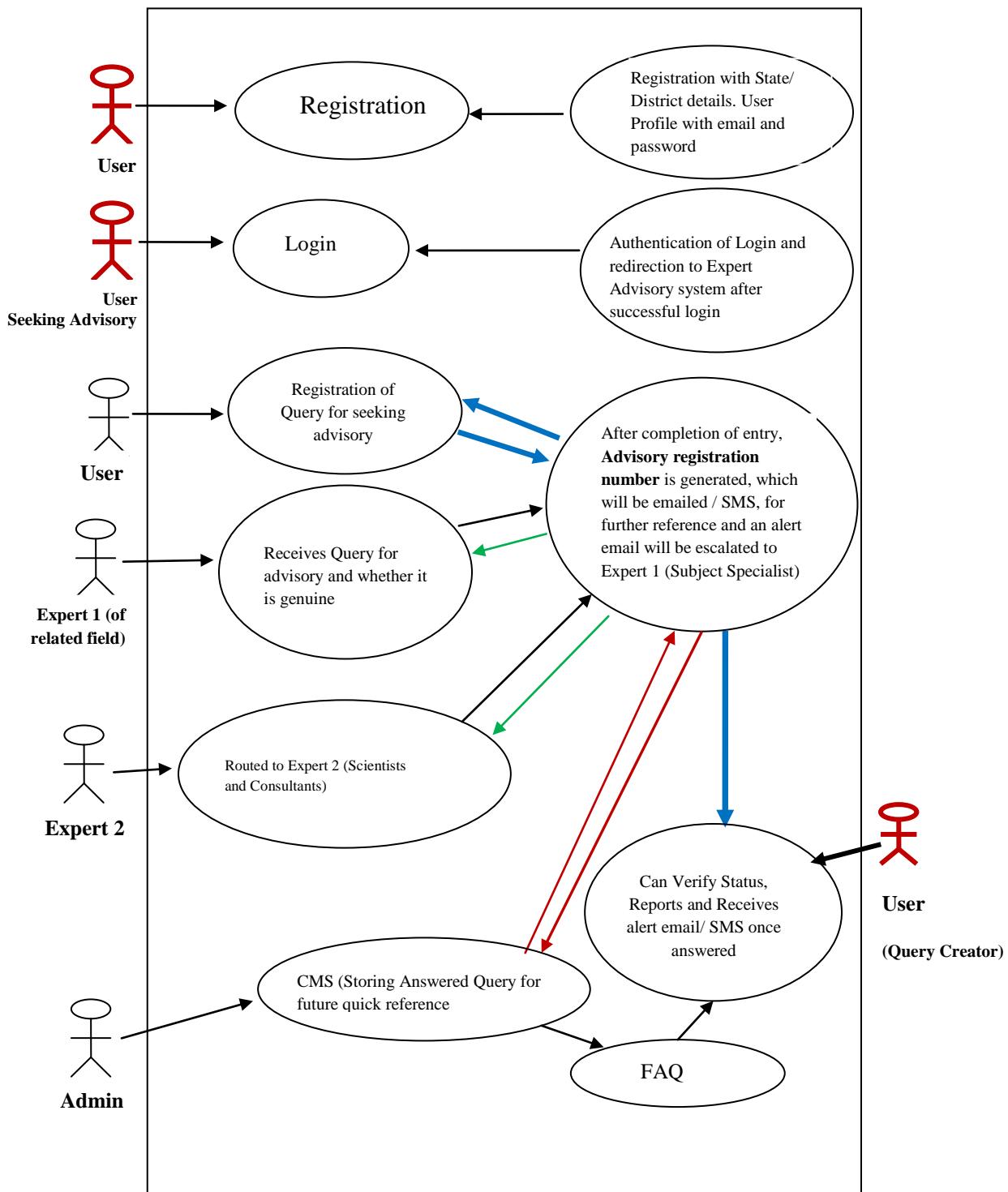


Figure - 76: Expert Advisory System – Use Case Diagram

## 7.3.4 Expert Advisory System (EAS) – Use cases

### 7.3.4.1 Use case for accessing Expert Advisory System and Registering Query

#### 7.3.4.1.1 Use Case for accessing Expert Advisory system

*Scope: This activity enables the actor to access the Expert Advisory System*

Use Case Field	Description	
Use Case ID:	UC_EAS_AEAS	
Use Case Name:	Access Expert Advisory System	
Actors:	Farmer	
Stake Holders:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This process relates to the access of Expert Advisory System provided on Central Agricultural Portal	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor clicks on Central Application Portal → Ask the Expert</li> <li>▪ Actor send SMS to seek expert advice</li> <li>▪ Actor send e-mail to seek expert advice</li> <li>▪ Actor dial toll free number of Kisan Call Centre seek expert advice</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Application Portal</p> <p>The Actor is either viewing the default page of the Central Agricultural Portal without Signing In to the Portal or he is registered into the Central Agricultural portal and signed in.</p>	
Post conditions:	Application for Expert Advisory System is loaded	
Input:	Nil	
Output:	Nil	
Normal Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Ask the Expert” link on home page of CAP</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Expert Advisory System” application</li> </ul>

Use Case Field	Description	
Alternative Flow:	Actor Actions	System Responses
	<ul style="list-style-type: none"> <li>▪ Actor registers his query for seeking expert advice through SMS</li> <li>▪ Actor registers his query for seeking expert advice through IVRS</li> <li>▪ Actor registers his query for seeking expert advice through e-mail</li> <li>▪ User choose to cancel the current operation</li> <li>▪ User logs out</li> </ul>	<ul style="list-style-type: none"> <li>▪ Query posted to seek expert advice by sending SMS to designated mobile number with prescribed prefix with SMS will be captured by the system and stored in the database</li> <li>▪ Query posted to seek expert advice by dialing toll free number of Kisan Call Centre will be entered in the system by operator and stored in the database</li> <li>▪ Query posted to seek expert advice by sending email to designated e-mail address will be captured by the system and stored in the database</li> <li>▪ Farmer writes the application, which is scanned and entered into the system by Agriculture officer</li> <li>▪ Exit condition Actor chooses to cancel the current operation, the system does not proceed and no data is processed. Use case ends.</li> <li>▪ Log out Actor chooses to log out from the current operation, the interface for expert advisory system disappears and no data is processed. The control goes to the portal home page. Use case ends</li> </ul>

Use Case Field	Description	
Exceptional Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes: other use case id	Use case for User registration	
UI: required/not required	Required	
Priority: Low/medium/high	High	
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent	
Business Rules:	The Central Agricultural Portal will display Labels/Help text in simple language specific to the practice so that the User does not find any difficulty in understanding the fields that are to be selected while entering a particular query.	
Special Requirements:	Link can be accessed using mouse as well as keyboard	
Assumptions:	The query will be routed to the State/District or Block Level from which it will be routed to the Central Level if necessary.	
Dependency:		
Notes and Issues:		

### 7.3.4.1.2 Use Cases to post query seeking expert advice using web based interface

*Scope: This activity enables the actor to post query seeking expert advice using web based interface*

Use Case Field	Description	
Use Case ID:	UC_EAS_RQ	
Use Case Name:	Post new query for Expert Advice	
Actors:	Farmer	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This service enables the user to enter a grievance into the system	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor selects “Ask the Expert” option on Home page</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal</p> <p>The Actor is either viewing the default page of the Central Agricultural Portal without logged in to the Portal.</p> <p>Actor is registered with the Central Agricultural Portal and logged in to the system</p>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Unique Reference ID and notifies user. Actor will receive an acknowledgement through SMS or email about his/her query.</p> <p>Query is marked to concerned authority (L1 officer) for addressing the issue</p> <p><b>At AF 3,4 :</b></p> <p>Home page is displayed.</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Ask the Expert” link on Central Agriculture Portal home page</li> <li>▪ Actor is provided with following</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Expert Advisory System” application</li> <li>▪ If user is registered with the CAP and logged in, system pre-populates the</li> </ul>

Use Case Field	Description	
	<p>fields for information entry</p> <ul style="list-style-type: none"> <li>• Date of posting query</li> <li>• Subject categories (List of all relevant Subject Categories such as Agriculture, horticulture, floriculture, Livestock, Fisheries, etc is provided)</li> <li>• Subject sub categories (List of all relevant Subject Sub Categories such as Crop, Seed, Fertilizers, Pesticides, Soil, Processing, Marketing etc is provided)</li> <li>• When the actor does not see the intended subject category of sub category in the list, ‘Others’ option is selected and on selecting this, a text area for free text writing is provided where actor can enter their intended services.</li> <li>• The actor selects subject category from a list option</li> <li>• The actor fills in an area specified for Summary of the Query that he is willing to post for seeking Expert Advice</li> <li>• Additional information, if not logged in and registered <ul style="list-style-type: none"> <li>• Name of actor (optional)</li> <li>• Mobile number (optional) - numeric</li> <li>• E-mail ID (optional)</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> </li> </ul>	<p>following fields, if entered by user previously while registering -</p> <ul style="list-style-type: none"> <li>• Name of actor</li> <li>• Mobile number - numeric</li> <li>• E-mail ID</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> <ul style="list-style-type: none"> <li>▪ On selection of Submit <ul style="list-style-type: none"> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Unique number assigned to the query for future reference is displayed on screen for actor in the form “YYYYSSDDDNNNNNN” where <ul style="list-style-type: none"> <li>YYYY-YEAR</li> <li>SS-State Code, Central Department Code</li> <li>DDD-District Code</li> <li>NNNNNN-06 Digit Query Application Number</li> </ul> </li> </ul> </li> <li>▪ Mail /SMS sent to actor with receipt for query and details of query posted. Timelines for resolution of query also mentioned</li> <li>▪ Mail is sent to concerned authority with details for query and timelines assigned</li> </ul>

Use Case Field	Description	
	<p>Village, Address)</p> <ul style="list-style-type: none"> <li>• Field to upload scan copy of hand written application, or any other document, photo, etc. For e.g. Photo of crop affected by pests, animal affected by disease.</li> <li>• Options to Submit, Exit provided</li> <li>• Actor selects submit option</li> <li>• The system proceeds to save data. Before saving following actions are performed:           <ul style="list-style-type: none"> <li>• Proper area of Expert Advice is chosen.</li> <li>• Subject category and sub category is properly mentioned</li> <li>• In case “Other” option is selected, the details on this area are specified.</li> <li>• Query Area is not blank.</li> </ul> </li> </ul>	
Alternative Flow:	<ol style="list-style-type: none"> <li>1. Exit condition - Actor chooses to cancel the current operation, the system does not proceed and no data is processed. Use case ends.</li> <li>2. Log out - Actor chooses to log out from the current operation, the interface for Expert Advisory disappears and no data is processed. The control goes to the portal home page. Use case ends.</li> </ol>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Agricultural Portal</li> </ul>
Exceptional Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> </ul>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> <li>▪ Standard internet message for connection not found</li> </ul>	
Includes: other use case id	Use case for accessing CAP, Use case for user registration, Use case for login	
UI: required/not required	Required	
Priority: Low/medium/high	High	
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent	
Business Rules:	<ul style="list-style-type: none"> <li>▪ The Central Agricultural Portal will display Labels/Help text in simple language specific to the practice so that the User does not find any difficulty in understanding the fields that are to be selected while entering a particular query.</li> </ul>	
Special Requirements:	<p>Input can be entered in vernaculars. The reply should be in the same language in which it will be entered. The text of query is not to exceed 5000 characters</p>	
Assumptions:	<ul style="list-style-type: none"> <li>▪ The query will be routed to the Designated Experts as per the requirement</li> </ul>	
Dependency:	<p><u>Extends</u> Main page of the Central Agricultural Portal. <u>Is Extended By</u> None. <u>Uses</u></p> <ol style="list-style-type: none"> <li>3. Login, if the actor has logged in to the portal.</li> <li>4. Id, provided in the previous login, in case the User has already posted a query</li> </ol>	
Notes and Issues:	<ul style="list-style-type: none"> <li>▪ .</li> </ul>	

### 7.3.4.1.3 Use Cases for posting query for seeking expert advice using SMS

*Scope: This activity enables the actor to post a query for seeking expert advice using SMS interface*

Use Case Field	Description	
Use Case ID:	UC_EAS_RG_SMS	
Use Case Name:	Post Query for Expert Advice using SMS	
Actors:	Farmer	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This service enables the user to post query for seeking Expert Advice using SMS	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor sends SMS to designated mobile number with prescribed prefix to post query for expert advice</li> </ul>	
Pre conditions:	<ul style="list-style-type: none"> <li>▪ The Actor is not registered with the Central Agricultural Portal.</li> <li>▪ Actor is registered with the Central Agricultural Portal.</li> </ul>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Unique Reference ID and notifies user. Actor will receive an acknowledgement through SMS or email about their query.</p> <p>Query is marked to concerned Expert (L1 officer) for providing expert advice</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor registers with the CAP by sending SMS NeGPA REG, &lt;First Name&gt;, &lt;State Name&gt;, &lt;District Name&gt;, &lt;Block Name&gt;, &lt;Village Name&gt;</li> <li>▪ Actor sends SMS to designated mobile number with prefix</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ If user is not registered with CAP, System prompts user to register by sending SMS.</li> <li>▪ If user sends SMS for registration, system checks the format and parameters against database (State, District, Block, Village) and if</li> </ul>

Use Case Field	Description	
	NeGPA EAS as follows – NAGPA EAS,<Message Text>	<p>proper, registers the user by saving his information and mobile number in the database.</p> <ul style="list-style-type: none"> <li>▪ If format and parameters for registration are not proper, system sends SMS to the user to register with correct parameters and format.</li> <li>▪ If user is registered with the CAP, system captures the query posted through SMS</li> <li>▪ The query is assigned to the respective Expert Advisor.</li> <li>▪ Unique number is assigned to the query for future reference in the form “YYYYSSDDDNNNNNN” where            YYYY-YEAR            SS-State Code, Central Department Code            DDD-District Code            NNNNNN-04 Digit Application Number</li> <li>▪ Mail /SMS sent to actor with receipt for query and details of query posted. Timelines for answering query also mentioned</li> <li>▪ Mail is sent to concerned Expert with details for query and timelines assigned</li> </ul>
Alternative Flow:	<ol style="list-style-type: none"> <li>1. User can register using IVRS, Web based interface</li> <li>2. User can post query using IVRS, web based interface, e-mail</li> </ol>	<ul style="list-style-type: none"> <li>▪ System captures the user registration information using respective Use cases</li> </ul>
Exceptional Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ User sends SMS, but signal is not available</li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Standard message for non-availability of signal</li> </ul>

Use Case Field	Description
Includes: other use case id	Use case for user registration
UI: required/not required	Not Required
Priority: Low/medium/high	High
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>■ The NeGP-Agriculture Mission Mode project will have designated mobile number for receiving queries for expert advice</li> </ul>
Special Requirements:	<p>SMS can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of query is not to exceed 180 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>■ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><u>Extends</u></p> <p>None</p> <p><u>Is Extended By</u></p> <p>None.</p> <p><u>Uses</u></p> <p>2. Registration details, if user is already registered for CAP</p>
Notes and Issues:	-

### 7.3.4.1.4 Use Cases for posting query seeking expert advice using e-mail

*Scope: This activity enables the actor to a query for seeking expert advice by sending e-mail*

Use Case Field	Description	
Use Case ID:	UC_EAS_RG_email	
Use Case Name:	Post Query for Expert Advice using e-mail	
Actors:	Farmer	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This service enables the user to post query seeking expert advice using e-mail	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor sends e-mail to designated e-mail address</li> </ul>	
Pre conditions:	<ul style="list-style-type: none"> <li>▪ The Actor is not registered with the Central Agricultural Portal.</li> <li>▪ Actor is registered with the Central Agricultural Portal.</li> </ul>	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system processes data, data is saved into the backend database.</p> <p>System generates a Unique Reference Id and notifies user. Actor will receive an acknowledgement through SMS or email about their query.</p> <p>Query is marked to respective expert (L1 officer) for answering</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor sends e-mail to designated e-mail address with designated subject for e.g. “NeGPA-EAS”</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ If user is not registered with CAP, System prompts user to register by sending e-mail with link for user registration.</li> <li>▪ If user is registered with the CAP, system captures the query posted for expert advice through e-mail (e-mail text)</li> </ul>

Use Case Field	Description	
		<ul style="list-style-type: none"> <li>▪ The query is assigned to the respective expert based on the location details and subject of the query of the applicant</li> <li>▪ Unique number assigned to the query for future reference in the form “YYYYSSDDDDNNNNNN” where YYYY-YEAR SS-State Code, Central Department Code DDD-District Code NNNNNN-6 Digit Application Number</li> <li>▪ Mail /SMS sent to actor with receipt for query and details of query posted. Timelines for answering of query also mentioned</li> <li>▪ Mail is sent to the concerned expert with details of query and timelines assigned</li> </ul>
Alternative Flow:	2. User can post query using IVRS, web based interface, SMS	<ul style="list-style-type: none"> <li>▪ System captures the query using respective Use cases</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ User sends e-mail, but it bounces back</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard message for e-mail</li> </ul>
Includes: other use case id	Use case for accessing CAP, Use case for user registration, Use case for login	
UI: required/not required	Not Required	

Use Case Field	Description
Priority: Low/medium/high	High
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>■ The NeGP-Agriculture Mission Mode project will have separate e-mail address for receiving queries seeking expert advisory</li> </ul>
Special Requirements:	<p>E-mail can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of query sent through e-mail is not to exceed 500 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>■ The query will be routed to the Central / State Department, Division, State / District or Block Level, as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b> None</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b></p> <p>3. Registration number, if user is already registered for CAP</p>
Notes and Issues:	-

### 7.3.4.1.5 Use Cases for posting query using IVRS

*Scope: This activity enables the actor to post query seeking expert advice using web based interface*

Use Case Field	Description	
Use Case ID:	UC_EAS_RG-IVRS	
Use Case Name:	Entry of new query using IVRS	
Actors:	Farmer	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This service enables the user to post a query seeking expert advice into the system using IVRS	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor rings up toll free number(1800-180-1551) of Kisan Call Centre to post his query seeking expert advice</li> </ul>	
Pre conditions:	Actor should have ringed up the toll free number (1800-180-1551) of Kisan Call center and his call has been answered.	
Post conditions:	<p><b>At NF 1:</b></p> <p>The system captures data from Kisan Call Centre IVRS system using web service written for it. The system processes data, data is saved into the backend database. System generates a Unique Reference Id and notifies user. Actor will receive an acknowledgement through SMS or email about his/her query.</p> <p>Query is marked to concerned Expert (L1 officer) for answering</p>	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor rings up toll free number(1800-180-1551) of Kisan Call Centre to lodge his/her grievance</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Expert Advisory System of CAP captures the details of query entered in Kisan Call Centre's application system with query type EAS using web service</li> </ul>

Use Case Field	Description
	<ul style="list-style-type: none"> <li>▪ Actor provides his personal details along with grievance</li> <li>▪ The operator captures the following details and enters into the Kisan Call Centre application system with user query type as EAS- <ul style="list-style-type: none"> <li>• Language</li> <li>• Date of Query</li> <li>• Subject category (List of all relevant subjects such as Agriculture, horticulture, floriculture, Livestock, Fisheries, etc is provided)</li> <li>• Subject sub categories (List of all relevant sub Subject Categories such as Crop, Seed, Fertilizers, Pesticides, Soil, Processing, Marketing etc is provided)</li> <li>• When the actor does not see the intended subject in the list, 'Others' option is selected and on selecting this, a text area for free text writing is provided where actor can enter their intended services.</li> <li>• The actor selects subject category from a list option</li> <li>• The actor selects subject sub category from a list option</li> <li>• The actor fills in an area specified for summary of the query that he is willing to post under query description</li> </ul> </li> <li>▪ User is registered with the CAP system. The following information about the user is fetched from Kisan Call Centre system - <ul style="list-style-type: none"> <li>• Name of actor</li> <li>• Mobile number - numeric</li> <li>• E-mail ID</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> </li> <li>▪ Unique number assigned to the query for future reference and send to the Kisan Call Center application system in the form "YYYYSSDDDDNNNNNN" where            YYYY-YEAR            SS-State Code, Central Department Code            DDD-District Code            NNNNNN-06 Digit Application Number </li> <li>▪ Mail /SMS sent to actor with receipt for query and details of query posted. Timelines for answering query also mentioned</li> <li>▪ Mail is sent to concerned expert with details for query and timelines assigned</li> </ul>

Use Case Field	Description
	<ul style="list-style-type: none"> <li>• Additional information, if not logged in and registered           <ul style="list-style-type: none"> <li>• Name of actor (optional)</li> <li>• Mobile number (optional) - numeric</li> <li>• E-mail ID (optional)</li> <li>• Address details (State, District, Block, Panchayat, Village, Address)</li> </ul> </li> <li>• The system proceeds to save data. Before saving following actions are performed:           <ul style="list-style-type: none"> <li>• Proper area of Query is chosen.</li> <li>• Query type is properly mentioned</li> <li>• In case “Other” option is selected, the details on this area are specified.</li> <li>• Query detail is not blank.</li> </ul> </li> </ul>
Alternative Flow:	1. Exit condition - Actor chooses to disconnect phone. Use case ends.
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Phone is busy</li> <li>▪ Phone is not picked up</li> </ul> <p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard busy ring tone</li> </ul>
Includes: other use case id	Use case for accessing CAP, Use case for user registration
UI: required/not required	Not Required
Priority:	High

Use Case Field	Description
Low/medium/high	
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	<ul style="list-style-type: none"> <li>■ Web services will be built to exchange data between Kisan Call Centre System and Expert Advisory system of CAP</li> <li>■ Web service will pull data from Kisan Call Centre application with Query type marked as EAS. It will pull information regarding personal details as well as query details</li> <li>■ Web service will push data regarding Unique Reference id to the Kisan Call Centre application system</li> </ul>
Special Requirements:	<p>Input can be entered in vernaculars.</p> <p>The reply should be in the same language in which it will be entered.</p> <p>The text of query is not to exceed 250 characters</p>
Assumptions:	<ul style="list-style-type: none"> <li>■ The query will be routed to the Central / State Department, Division, State / District or Block Level as per the requirement</li> </ul>
Dependency:	<p><b><u>Extends</u></b> None</p> <p><b><u>Is Extended By</u></b> None</p> <p><b><u>Uses</u></b> 2. Id, in case the User has already posted a query.</p>
Notes and Issues:	-

### 7.3.4.1.6 Use Cases to view query list and take appropriate action

*Scope: This activity enables the actor to view query list and take appropriate action*

Use Case Field	Description	
Use Case ID:	UC_EAS-VQ	
Use Case Name:	View the query and take necessary action	
Actors:	Experts from SAUs, ICAR Institutes, Government Officers	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	The Expert Advisory System process relates to the viewing the queries fed into the system by the farmers to get expert advice.	
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor receives mail for expert advice</li> <li>▪ Actor access his dashboard for pending activities</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal and logged in</p> <p>Only Users authorized to receive the queries for expert advisory already listed/entered in system receive it</p>	
Post conditions:	Query is directed to person responsible to address it	
Input:		
Output:		
Normal Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Actor views e-mail alerting him of receiving query</li> <li>▪ Actor clicks on the “Expert Advisory System” link of CAP</li> <li>▪ Actor is provided with list of queries</li> <li>▪ Actor double clicks the query in the list</li> <li>▪ Actor is provided with the following fields for information entry of the selected query <ul style="list-style-type: none"> <li>• Subject Category (options)</li> </ul> </li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Mail /SMS sent to actor under “Responsibility” field with details of query posted. Timelines for answering queries also mentioned</li> <li>▪ Mail is sent to concerned expert</li> <li>▪ Mail/SMS is sent to the concerned user about the status of query posted by him</li> </ul>

Use Case Field	Description	
	<p>of all relevant Subject Categorized such as Agriculture, Livestock, Fisheries, Horticulture, Floriculture etc is provided)</p> <ul style="list-style-type: none"> <li>• Subject Sub category (options of all subject sub categories like seeds, pesticides, soil etc is provided)</li> <li>• Option for <b>Others</b> is provided</li> <li>• Unique reference number</li> <li>• Responsibility (option to select user from list). By default Name of the officer at appropriate level of the escalation matrix will be displayed. However, there will be flexibility to search and select any name from the internal user list.</li> <li>• Time frame (option to enter number of days provided)</li> <li>• Actor selects submit option</li> </ul>	
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Application Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes:	Use case for login	

Use Case Field	Description
other use case id	
UI: required/not required	Required
Priority: Low/medium/high	High
Frequency of Use:  Continuous/ frequent/ medium/ less/ rare	Frequent
Business Rules:	The query will be assigned to the officer depending on the options entered by user like department/section/state/district/block
Special Requirements:	To arrange the records in ascending order or descending order of desired column  Search and filter facility to search particular query based on user name, id or type of query.  Facility to assign multiple queries in the list to one officer at a time by selecting these based on the section/type.
Assumptions:	<ul style="list-style-type: none"> <li>■ Officer has privileges for necessary access</li> </ul>
Dependency:	<p><b><u>Extends</u></b> Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b> Login, if the actor has logged in to the portal. Id, provided in the previous login, in case the User has already posted a query.</p>
Notes and Issues:	-

### 7.3.4.1.7 Use Cases for answering query seeking expert advice

*Scope: This activity enables the actor to answer query seeking expert advice*

Use Case Field	Description	
Use Case ID:	UC_EAS_AQ	
Use Case Name:	Answering Query	
Actors:	Experts from SAUs, ICAR Institutes, Government Officers	
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers	
Description:	This service enables the actor to provide expert advice to the query posted	
Trigger:	<ul style="list-style-type: none"> <li>▪ Mail received from concerned authority to provide expert advice</li> </ul>	
Pre conditions:	<p>Actor should have opened the Central Agricultural Portal</p> <p>Users authorized to receive the queries regarding expert advice already listed/entered in system</p>	
Post conditions:	<p>Expert Advice is updated in the system and mail is sent to actor and concerned authority with answer</p> <p>Published answers are added in the FAQ List and displayed on the home page of the CAP /SAP/Service</p> <p>SMS is sent to the stakeholder's registered mobile number.</p>	
Input:		
Output:		
Normal Flow:	<b>Actor Actions</b> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Expert Advisory System” link on CAP</li> <li>▪ Actor is provided with list of queries pending at his end</li> <li>▪ Actor double clicks the query in the list</li> <li>▪ following fields are displayed for entering advice           <ul style="list-style-type: none"> <li>• query</li> </ul> </li> </ul>	<b>System Responses</b> <ul style="list-style-type: none"> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Mail /SMS sent to actor with receipt for query and details of expert advice</li> <li>▪ Mail/SMS is sent to user who has posted query and concerned authority with details for query and advice given</li> <li>▪ Once answered, query should be</li> </ul>

Use Case Field	Description	
	<ul style="list-style-type: none"> <li>• Unique reference number</li> <li>• Expert Advice</li> <li>• Option to submit</li> </ul>	removed from the list and included in the FAQ List
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of Central Agricultural Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes: other use case id	Use case for Login	
UI: required/not required	Required	
Priority: Low/medium/high	High	
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent	
Business Rules:	<ul style="list-style-type: none"> <li>▪ Queries assigned to the actor will be displayed in the dash board of the actor</li> <li>▪ Actor can escalate the query, if it cannot be answered at his level</li> <li>▪ If no mail id or phone number is provided by actor posting the query, advice is displayed only through the user interface available on portal (user details as registered)</li> </ul>	
Special Requirements:	To arrange the records in ascending order or descending order of desired column	

Use Case Field	Description
	<p>Search and filter facility to search particular query based on user name, id or type of query.</p> <p>Facility to assign multiple queries in the list to one officer at a time by selecting these based on the section/type.</p>
Assumptions:	<ul style="list-style-type: none"> <li>▪ Resolution matrix for queries has been defined and necessary privileges have been granted to the user for answering the queries as per this matrix</li> </ul>
Dependency:	<p><u>Extends</u></p> <p>Main page of the Central Agricultural Portal.</p> <p><u>Is Extended By</u></p> <p>None.</p> <p><u>Uses</u></p> <p>Login, if the actor has logged in to the portal.</p> <p>Id, provided in the previous login, in case the User has already posted a query</p>
Notes and Issues:	-

#### 7.3.4.1.8 Use Cases for escalation of grievance

*Scope: This activity enables the actor to escalate a query*

Use Case Field	Description
Use Case ID:	UC_EAS_EQ
Use Case Name:	Escalation of query
Actors:	Experts from SAUs, ICAR Institutes, Government Officers
Stake Holder:	Farmer, Experts from SAUs, ICAR Institutes, Government Officers
Description:	This service enables the user to escalate a query in the system
Trigger:	<ul style="list-style-type: none"> <li>▪ Actor selects Expert Advisory System option on Home page</li> </ul>
Pre conditions:	Actor should have opened the Central Agricultural Portal

Use Case Field	Description	
	<p>Users authorized to receive the query for expert advice already listed/entered in system (for escalation)</p> <p>Query is registered in the system</p>	
Post conditions:	Query is registered in the system and mail is sent to actor and concerned authority for answering the query post escalation	
Input:		
Output:		
Normal Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Actor clicks on the “Expert Advisory System” link on Central Agriculture Portal home page</li> <li>▪ Actor selects “Query Escalation” option</li> <li>▪ Actor is provided with following fields for information entry <ul style="list-style-type: none"> <li>• Query (registered earlier)</li> <li>• Unique Reference Number</li> <li>• Comments (to enter details for escalation)</li> <li>• List of officers to select from to which query is to be escalated with default option set already</li> <li>• Options to Submit, Exit provided</li> <li>• Actor selects submit option</li> </ul> </li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Actor is redirected to “Expert Advisory System” application</li> <li>▪ This option is available only when resolution cannot be provided by actor at his level</li> <li>▪ Information as entered by actor is registered in Database.</li> <li>▪ Mail /SMS sent to user with receipt for query and details of query posted. Timelines for answering query also mentioned</li> <li>▪ Mail is sent to concerned authority (for escalation) with details for query and timelines assigned</li> </ul>

Use Case Field	Description	
Alternative Flow:	<ul style="list-style-type: none"> <li>▪ Actor selects Exit option</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actor is redirected to home page of State Application Portal</li> </ul>
Exceptional Flow:	<p><b>Actor Actions</b></p> <ul style="list-style-type: none"> <li>▪ Clicks link but the Service URL is unavailable</li> <li>▪ Clicks link but the actor's internet access has been temporarily disabled</li> </ul>	<p><b>System Responses</b></p> <ul style="list-style-type: none"> <li>▪ Standard internet message for URL not found</li> <li>▪ Standard internet message for connection not found</li> </ul>
Includes: other use case id	Use cases for assigning responsibility to be used	
UI: required/not required	Required	
Priority: Low/medium/high	High	
Frequency of Use: Continuous/ frequent/ medium/ less/ rare	Frequent	
Business Rules:	<ul style="list-style-type: none"> <li>▪ System should display default option for escalation of query to the next level officer</li> <li>▪ System should allow actor to select the next level officer.</li> <li>▪ After escalation the query is marked to the next level officer</li> </ul>	
Special Requirements:	<p>To arrange the records in ascending order or descending order of desired column</p> <p>Search and filter facility to search particular query based on user name, id or type of query.</p> <p>Facility to assign multiple queries in the list to one officer at a time by selecting these based on the subject category, sub category.</p>	
Assumptions:	<ul style="list-style-type: none"> <li>▪ Resolution matrix for queries has been defined and necessary privileges have been granted to the user for answering the queries as per this matrix</li> </ul>	
Dependency:	<u>Extends</u>	

Use Case Field	Description
	<p>Main page of the Central Agricultural Portal.</p> <p><b><u>Is Extended By</u></b></p> <p>None.</p> <p><b><u>Uses</u></b></p> <p>Login, if the actor has logged in to the portal.</p> <p>Id, provided in the previous login, in case the User has already posted a query</p>
Notes and Issues:	-

### 7.3.5 Data Entities for Expert Advisory System

Data entities for Expert Advisory System have been provided in Annexure – C, under section IV Data entities for Expert Advisory System.

### 7.3.6 Formats for Reports

User may be allowed to see the status of query by entering Unique Reference Number in Expert Advisory System module of Central Agricultural Portal. To know the status of query user may not need to login with user id and password.

Enter Reference Id Number: <input type="text" value="YYYYSSDDNNNNNN"/>	
Reference Id: YYYYSSDDNNNNNN Name: AAAAAA Date Of Query: DD/MM/YYYY	State: SSSS District Name: DDDDDD Block: BBBB Village Name :VVVVVV
Description of Query : XXXXXXXXXXXXXXXXXXXXXXXXXX BBBBBBBBBBBBBBB JJJJJJ	
Status : Answered/Pending	
Expert Advice by officer : UUUUUUU UUUUU YYYYYYYYYY UUUU	
Officer Name : JKJKJK Date:DD/MM/YYYY	<b>Office Address :</b> OAOAOAOAOAOAAOA

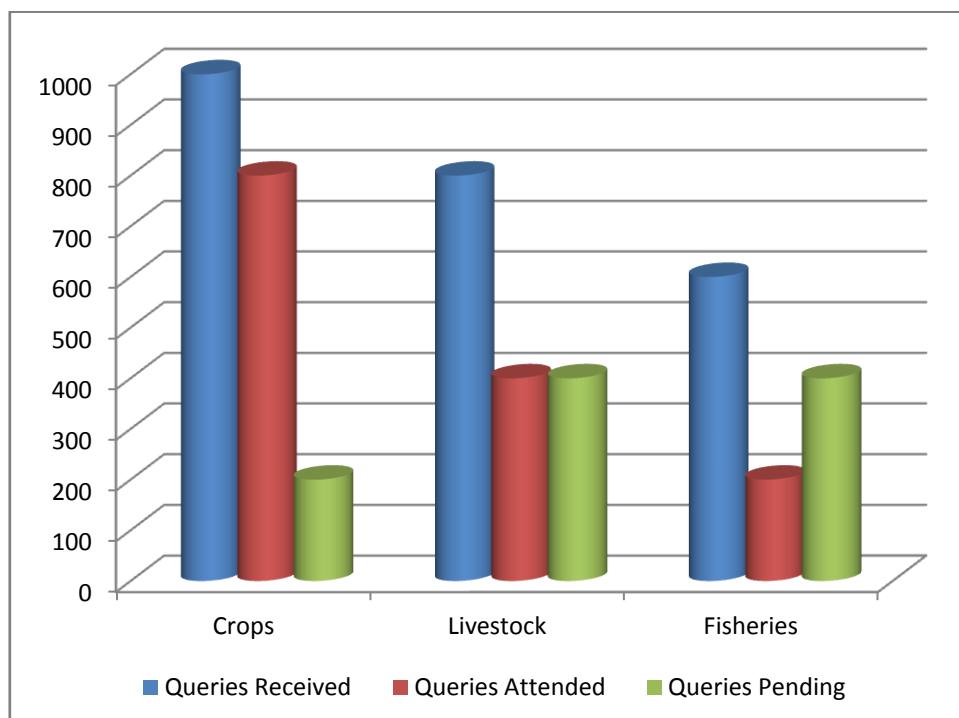
### 7.3.6.1 Report formats for monitoring

System will have facility to generate reports used by higher authority for Monitoring purpose.

1. Number of queries asked Subject Category wise and subject sub category wise to know the area in which farmer has more queries.
2. List of Officers and Office Heads (District Wise / Block Wise) – Not attending the queries timely. – Calculation based on Number of queries pending at their end.

On clicking on officer Name or pending cases number, list of pending cases with will be displayed.

### 7.3.6.2 Generation of Dynamic Charts



**Figure - 77: Expert Advisory System – Chart - Subject Category wise queries received, attended, pending**

## 7.3.7 Layouts for Expert Advisory System

Link for Expert Advisory System will be provided on the Home Page of the Central Agricultural Portal as “Ask the Expert”. After clicking this link, the Screen will be displayed as shown in the Figure - 78 with two options – one for posting query for expert advice and other for searching the query posted earlier.

The screenshot shows the homepage of the NeGP-AMMP Central Agricultural Portal. At the top, there is a green header bar with the text "Select Language" followed by links to various Indian languages: Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, and Telugu. Below this is another row of links for Accessibility Options, Site Map, Add to Favourite, Tell a Friend, RSS, Select Theme, and Font Size. The main header features the "NeGP" logo with the tagline "AGRICULTURE IMPROVING FARMERS" and the text "Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India". The navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a "Home->Ask the Expert" link. To the right of the navigation bar is a "SEARCH BOX" with a "GO" button. On the left, there is a sidebar with links to "Message Board", "Grievance Management", "Farmer's Corner", "Industry Corner", "National Farmer's Database", "Expert Advisory System", "Knowledge Management", "Picture Gallery", "Circulars", "Apply Online", and "Download Forms". The main content area is titled "Ask the Expert" and contains two options: "Post Your Query" and "Search your Query". At the bottom of the page, there is a footer section with links to "About this Portal", "Help", "Terms of Use", "Visitor Summary", "Newsletter", "Your Opinion!", "Related Links", and "Accessibility Statement". It also includes the "NeGP" logo, a statement about demo text, and a note from NIC: "The site is designed by 'National Informatics Centre, Ministry of Communications and Information Technology, Government of India'".

Figure - 78: Expert Advisory System - Menu

User will be prompted to register, if he has not register already after clicking any of the links. If user is registered already and selects “Post your Query”, then the screen will be displayed as shown in Figure 79.

A Dropdown Menu will be displayed, for selection of Subject Category. The User can then select the Subject Category as Agriculture, horticulture, floriculture, Livestock, Fisheries etc. In case he does not find any suitable Subject Category, he may select option “Other”. User can select Subject Sub-category as Crop, Seed, Fertilizers, Pesticides, Soil, Processing, Marketing etc.

**Figure - 79: Expert Advisory System – Post Query**

After clicking “Next” button, screen will be displayed as shown in Figure 80 giving details of user and query.

**Figure - 80: Expert Advisory System – Submit Query**

After clicking “Submit” button, the screen will be displayed as shown in Figure 81. The Query Number, Submission date and time will be displayed for future reference.

The screenshot shows the NeGP Agriculture website interface. At the top, there's a green header bar with links for selecting language (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujrati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telgu), accessibility options, and a font size selector. The main header features the NeGP logo and the text "Department of Agriculture & cooperation, Ministry of Agriculture, Government of India". Below the header is a navigation menu with categories like Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and links for Home, Ask the Expert, Post Your Query, and a search box.

The central content area displays a message titled "Ask the Expert" with a sub-section "Query Posting". It shows a success message: "Your Query has been posted Successfully", followed by "Query No : 9110xxxxxx" and "Date / time : 24/12/2011 10:35:45". A note below says "Please note down the Query Number for future reference". A "Close" button is at the bottom of this message box.

On the left side, there's a sidebar with links for Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms.

The footer contains links for Governance Project (AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA), About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, Accessibility Statement, and a note about the site being designed by NIC. The NIC logo is also present in the footer.

**Figure - 81: Expert Advisory System – Acknowledgement and Query number assignment**

If user selects “Search” option, he will be prompted for entering criteria for search as shown in Figure 82. User can search his query either by Query no. or by date.

The screenshot shows the NeGP Agriculture Expert Advisory System interface. At the top, there's a green header bar with the Indian national emblem, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Odia, Dogri, English, Gujrati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Orya, Punjabi, Santhali, Sindhi, Tamil, Telugu), and accessibility options. Below the header is the NeGP logo and the text "Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India". The main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search bar labeled "Ask the Expert -> Search your query" with a "GO" button. On the left, a sidebar lists links for Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central search area has a heading "Ask the Expert" and a sub-heading "Search your Query". It features a dropdown menu "Search by :" with "Query No." selected, a search input field, and a "Submit" button. At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and a "Governance Project" section. It also includes links for About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion, Related Links, and Accessibility Statement. A note about demo text is present, followed by a statement that the site is designed by NIC.

**Figure - 82: Expert Advisory System – Search Query**

After clicking submit button, list of queries satisfying the criteria given by the user will be displayed as shown in Figure 83.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there's a green header bar with the Indian Government logo, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Odia, Dogri, English, Gujrati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), and accessibility options. Below the header is the NAGP logo and the Department of Agriculture & Cooperation logo. The main navigation bar includes links for Crops (Rice, Wheat, Cashewnuts, Cotton, Jute, Banana, Grapes, Orange, Pine Apple, more...), various agricultural services (Seed, Pesticides, Fertilisers, Soil Health, Irrigation, Farm Machinery, Crop, Livestock, Fisheries, Training & Extension, Good Agricultural Practices (GAPs), Prices and Arrivals, e-Market, Procurement Points, Marketing Infrastructure, Exports and Imports, Weather and Agro-met advisory, Drought Relief and Management, Monitoring Implementation), and a search bar labeled 'Ask the Expert -> Search your query' with a 'GO' button. On the left, a sidebar lists links like Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The central content area is titled 'Ask the Expert' and 'Search your Query'. It features a search form with dropdowns for 'Search by' (Query No.) and a text input field, along with a 'Submit' button. Below the search form is a 'Search Results' section with a table showing one result:

Query No.	Name	Mobile No.	Created Date
<a href="#">9011xxxxxxxx</a>	Abc XYZ	9899xxxxxx	11/10/2011

At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, About this Portal, Help, Terms of Use, Visitor Summary, Newsletter, Your Opinion!, Related Links, Accessibility Statement, and a note about the site being designed by NIC. The NIC logo is also present.

Figure - 83: Expert Advisory System – Search results

User can click on the query to know the status in case of pendency or the advice given by the expert depending on the present status of the query. The advice will be displayed as shown in the Figure 84.

The screenshot shows the NeGP-AMMP Central Agricultural Portal. At the top, there's a green header bar with the NeGP logo, language selection (Hindi, Assamese, Kannada, Malayalam, Marathi, Bengali, Bodo, Dogri, English, Gujarati, Kashmiri, Konkani, Maithili, Manipuri, Nepali, Oriya, Punjabi, Santhali, Sindhi, Tamil, Telugu), and accessibility options. Below the header is the main navigation bar with links for Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, and various agricultural services like Crops, Rice, Wheat, etc. A sidebar on the left lists links such as Message Board, Grievance Management, Farmer's Corner, Industry Corner, National Farmer's Database, Expert Advisory System, Knowledge Management, Picture Gallery, Circulars, Apply Online, and Download Forms. The main content area features a large banner for 'Ask the Expert' with a search box. Below the banner, the 'Ask the Expert' section displays advice for the Telangana Region regarding Nitrogen and Urea application. It includes a feedback section with 'Yes' and 'No' buttons and a 'Post your Feedback' button. At the bottom, there's a footer with links for AGMARKNET, DACNET, Agricultural Census, Seednet, Nav Krishi, RKVY, MMA, and various government departments. It also includes a statement about the portal's design by NIC and the NIC logo.

**Figure - 84: Expert Advisory System – Expert Advice**

## 8 National Farmer's Database

Major stakeholder of the NeGP-Agriculture Mission mode project is farmer and hence primary concern is to understand and address his service requirements. To understand, plan and provide the required services to the farmers, capturing farmer's details is of utmost importance like his contact details, landholding, types of crops grown by him, his financial status and needs, input needs, etc. Farmer's information would help in tracking the real scenario and know the current status of farmers, which would help in equipping the farmer with right knowledge and tools, providing financial aid, spreading awareness of GAPs (Good Agricultural Practices) and also in decision making and planning initiatives to boost the growth in agriculture sector. Thus to meet prime objectives of NeGP-AMMP, it is required to create a platform where farmers' data can be captured in entirety. National Farmer's Database will be created under NeGP-Agriculture Mission Mode Project for capturing the farmer's detail.

To get the 360<sup>0</sup> view of farmer, the information to be captured about farmer can be classified in two parts:-

- Part I: Static Information: It caters to details, related to farmers, which are not likely change with every agricultural season like personal details, address details, contact details, occupation details, farm/ land details, irrigation infrastructure owned, Identification details, markets accessed, family dependents, Crop cycles, equipments, etc.
- Part II: Dynamic Information: It caters to details related to farming, hence to farmers, that change with every agricultural season like seed type, variety, seed quantity, fertilizers / pesticides details, crops produced, quantity produced, expenditure, income, Crop insurance details, etc..

The Information to be captured will further be classified as (i) Mandatory for registration with Central Agricultural Portal for receiving services and (ii) Not mandatory - detail information which will facilitate capturing more details of the farmer, but will not be mandatory for registration.

The detail parameters have been listed here in the following section -

### 8.1 Minimum Required data elements (HCF)

1. Farmer's detail
  - a. Name (First Name, Middle Name, Last Name)
  - b. Address (State, District, Block, Village, Pin Code (Link with Post database))
  - c. Phone - Landline

- d. Mobile number
- e. e-mail id
- f. Farmer Type (Agricultural, Livestock, Fisherman)

## 8.2 Sum Total of Required data elements (LCM) for 360<sup>0</sup> view

### 8.2.1 Static Information

1. Farmer's detail
  - a. Name (First Name, Middle Name, Last Name)
  - b. Address (State, District, Block, Village)
  - c. Phone - Landline
  - d. Mobile number
  - e. e-mail id
  - f. Farmer Type (Agricultural -Crop, Horticulture, Sericulture, Apiculture, Floriculture, Forestry etc., Livestock, Fisherman)
  - g. Farming Sub Category
    - i. Crop Farming-Rice, Maze, sugarcane etc.
    - ii. Fish farming-Trout, Lobsters etc.
    - iii. Horticulture Farming (Apple, Mango etc.)
  - h. Father's name
  - i. Mother's name
  - j. Gender
  - k. Age (Date of birth)
  - l. Marital status
  - m. Photo
  - n. Identification (Voter id, Ration Card, UID, Driving License, KCC No., NPR, Fishermen Biometric card etc.)(Integration with respective databases)
    - i. Personal Identification Mark
  - o. Educational Qualification
    - i. Illiterate/Literate
    - ii. If literate, Non-Matric, Matric, graduate, post-graduate, Diploma, Other
    - iii. Field Knowledge (Yes/No)

Field knowledge, if yes,

Type of knowledge: extension works, knowledge on inputs, mechanical operations of farm equipments, repairs of farm equipments

**2. Family details**

- a. No. of family members (Dependent)
- b. Name(First Name, Middle Name, Last Name), Gender, Relationship with farmer, age, Educational qualification, whether employed, if yes, then income, photo

**3. Farm details**

- a. Land Holding details (Khasra No., Rakba, Rin Pustika No., Survey/subdivision number, Sub-Survey No. etc.) (Integration with Land Records)
- b. Farm Size (In Bigha/acres/Hectares/..) (Based on it automatic categorization as Landless Farmer(0 – 3 Bigha / 0 - 0.4 Hectares) , Marginal Farmer (3 – 7.5 Bigha / 0.4 – 1 Hectares), Small Farmer (7.5 – 15 Bighas / 1-2 hectares) , Big Farmer (More than 15 Bighas / More than 2.0 Hectares)
- c. Soil type—Here the state specific soil type may be taken which should be mapped with 9 fold national land classification as this will help to satisfy many queries.
- d. Land type - Irrigated/Rainfed/Dry land
- e. Irrigation Infrastructure available on farm (Wells, tube wells, drip irrigation, etc.)
- f. Type of Cultivation (Self / Lease / Share)
- g. Man Power for Farming Self / Hired Basis
- h. Type of area
  - i. Area under Nursery
  - ii. Area under vegetable crops
  - iii. Area under permanent crops
  - iv. Area under progeny orchard
  - v. Planting materials
  - vi. Tuber crops

**4. Crop details**

- a. Crops cycles
- b. Crops grown

**5. Livestock details**

- a. Number of animals owned
- b. Species, Animal, breed, age

**6. Equipment details**

- a. Name of equipment
- b. Number
- c. Make
- d. Purchased from Self Finance/Loan

7. Source of agricultural Inputs
  - a. Name and address of the dealer/agency (Seed, Fertilizers, Pesticides)
  - b. Type of dealership (whether wholesale/retail)
  - c. State/District/Sub division/Block/Village
  - d. Whether license is valid or not
8. Markets accessed for produce
  - a. Name of the market and address
9. Bank details
  - a. Bank name
  - b. MICR No
  - c. Branch Name and Code
  - d. Account Number
  - e. Loan as on date
    - i. loan from District Cooperative Bank
    - ii. loan from Cooperative Society (PACS)
    - iii. loan from Irrigation Department
  - f. Kisan Credit Card holder (Yes/No)
10. Insurance details
  - a. Name of the agency
  - b. Type of insurance
  - c. Insured on
  - d. Policy no
  - e. Date of maturity
  - f. Premium
  - g. Mode of payment
11. Family Economical Status
  - a. APL/BPL/AAY (Antyodaya Anna Yojana)
  - b. Annual Income
    - i. From farm
    - ii. From livestock
    - iii. From Fisheries
    - iv. From other activities (Specify)
12. Source of knowledge /Technical updating

- a. State Agriculture Departments, KVK, SAU, ICAR, Helpline (toll free numbers), Meetings, Trainings/ Workshops, TV, Radio, SMS, progressive farmers, extension workers, etc.

### 13. Other

- a. House (owned / rental) (Pakka / Kaccha)
- b. Size of house (Sq. meters/feet)
- c. Caste/ Category (SC/ST/BC/OBC/Gen)
- d. Religion
- e. Minority (Yes/No)
- f. Membership in societies/ groups like PACS, Agricultural cooperatives, NGOs, SHGs etc.
  - i. Name of the agency
  - ii. Address details
  - iii. Membership number
  - iv. Date of issue
  - v. Date of validity

## 8.2.2 Dynamic Information to be filled every season

1. Year, Season (Rabbi/ Kharif/Zail Rabi/Zail Kharif)

2. Inputs

- a. Crop Sown
- b. Area Sown
- c. Variety used
- d. Seeds used
- e. Fertilizers used
- f. Pest occurrence
- g. pesticides used
- h. Water sources used
- i. Labor
- j. Machinery used

3. Production, Income, Expenditure, Insurance

- a. Crop wise production
- b. Crop wise income
- c. Expenditure
- d. Crop Insurance details

- i. Name of the agency
  - ii. Type of insurance
  - iii. Insured on
  - iv. Policy no
  - v. Date of maturity
  - vi. Premium
  - vii. Mode of payment
4. Marketing
- a. Warehouse facility used & distance from point of production
  - b. Processing facilities used & distance from point of production
  - c. Markets & distance from point of production

### **8.3 Integration with the databases**

- 1. DMS database for National Dairy farmer database
- 2. National Marine Fishermen database
- 3. Land Records database
- 4. NPR Register, UID database, Post database, Property Registration

Already some states like Maharashtra, Madhya Pradesh, Karnataka, Kerala, etc. are capturing the basic details of the farmer during registration for various agricultural related services being provided by them under various projects.

### **8.4 Standards to be used**

MDDS – Demographic (Person Identification and Land Region Codification) Standards by DeitY

### **8.5 Entity Relationship Diagrams**

Relationship of the various entities involved in the form is depicted in the Entity Relationship Diagrams on next page -

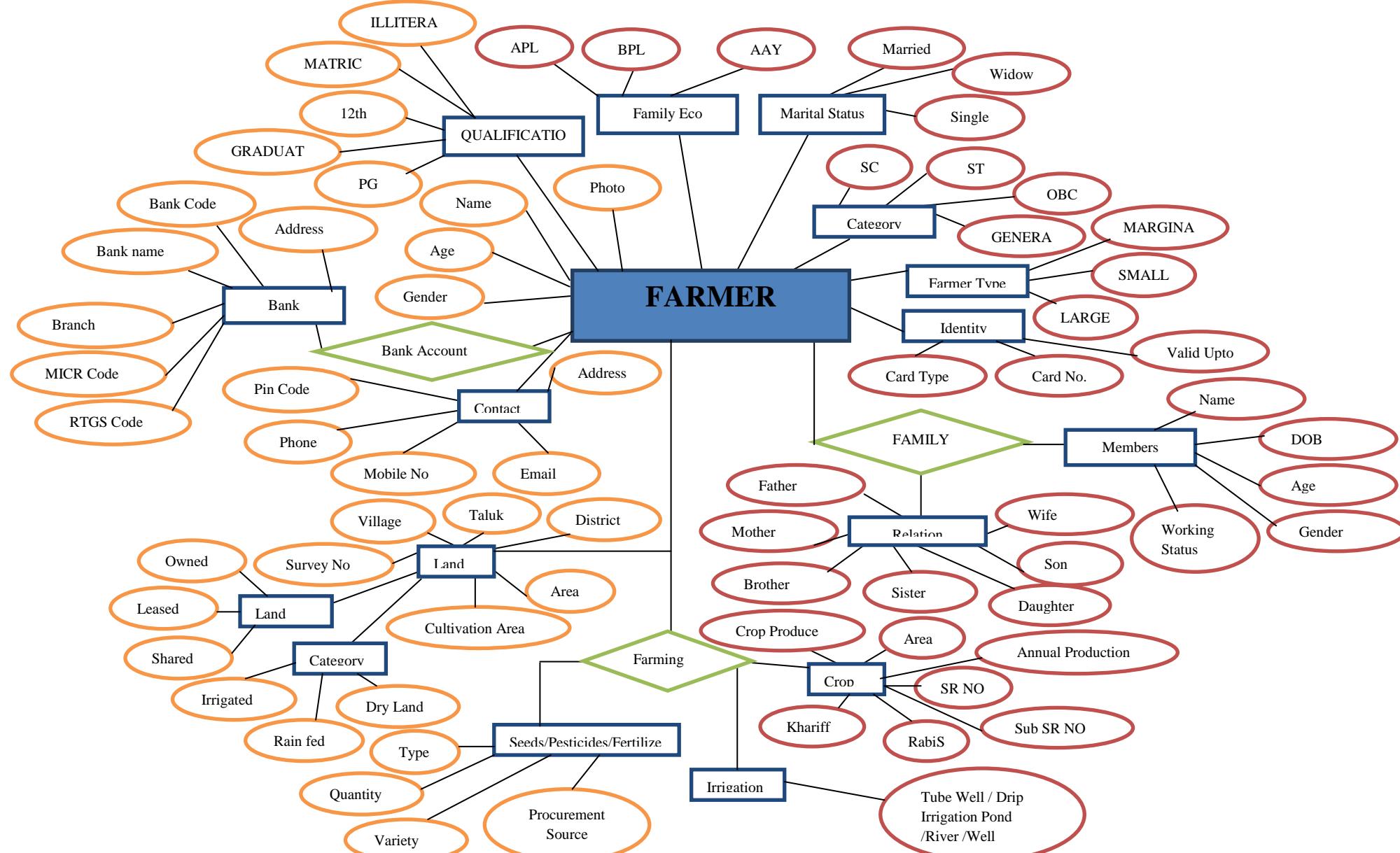
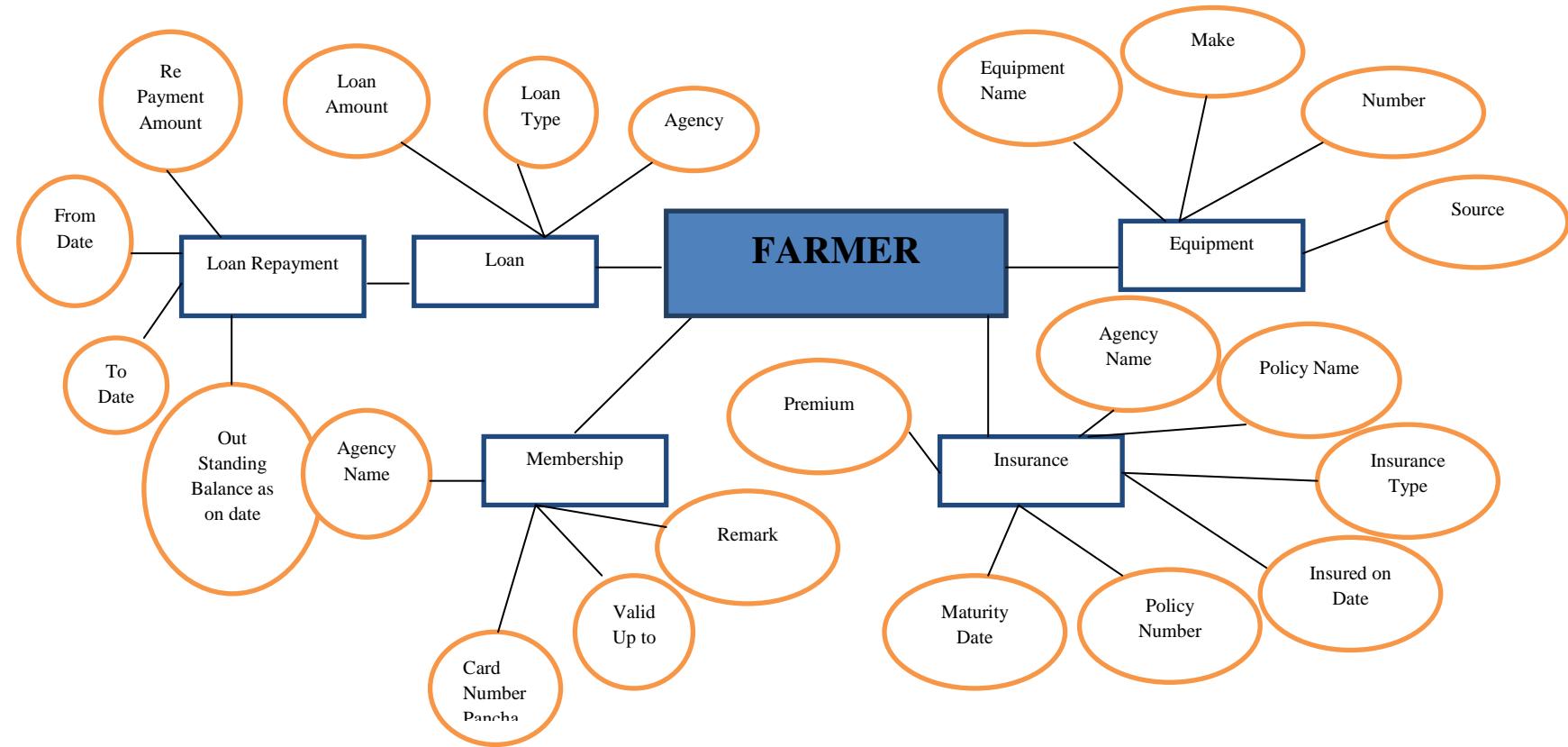


Figure - 85: National Farmer's Database – Entity Relationship Diagram1



**Figure - 86: National Farmer's Database Entity Relationship Diagram 2**

## 8.6 User Interfaces for National Farmers' Database

The screenshot shows a web-based application titled "Farmer Database Performa". The main title is "National Farmers' Database form". On the left, there is a logo for "NeGP AGRICULTURE EMPOWERING FARMERS" featuring a green wreath, a blue globe, and a green bull. The form is divided into sections: "Personal Details" and "Address Details". The "Personal Details" section contains fields for First Name, Middle Name, Last Name, Father's Name, Mother's name, Spouse Name, Marital Status, Gender, Date of Birth, No. of Family members (Adults and Children), Educational Qualification, Discipline, and Annual Income (in Rs.). The "Address Details" section includes fields for House No., State, District, Block, Panchayat, Village, and Pin Code.

Figure - 87: National Farmer's Database – Screen 1

The screenshot shows a continuation of the "Farmer Database Performa" application. The sections include "Contact Details", "Identification Details", "Dependent Family Member Details", and "Occupation Details". The "Contact Details" section has fields for Phone-Landline, Mobile, and Email-id. The "Identification Details" section has fields for Identification Mark, Photo (with a "Browse..." button), Identification Proof Submitted (with "Add More Proofs" and "Save" buttons), Identification Proof (with dropdowns for Card No. and Valid Upto), and a file input field. The "Dependent Family Member Details" section allows adding members with fields for Name, Date of Birth, Age, Employed (with a dropdown for "No"), Income (in Rs.), Gender, and Relationship with Farmer. The "Occupation Details" section includes fields for Farmer Type (Agriculture), Farmer Sub-Category (01), Field Knowledge (radio buttons for Yes and No), and checkboxes for Field Knowledge Domain (Extension works, Mechanical operations of farm equipments, Knowledge on inputs, Repairs of farm equipments).

Figure - 88: National Farmer's Database – Screen 2

**Occupation Details**

Farmer Type: Agriculture ▾ Farmer Sub-Category: 01 ▾ Field Knowledge:  Yes  No

Field Knowledge Domain:  Extension works  Mechanical operations of farm equipments  Knowledge on inputs  Repairs of farm equipments

**Farm/ Land Details\***

Khasra No.  Rakba No.  Rin Pustika No.

Survey/ Sub-division No.  Sub-Survey No.  Farm Size  in Select Unit ▾

Soil Type  Soil Type1 ▾ Land Type  Landtype1 ▾ Type of Cultivation type1 ▾

Type of Area  Area under permanent crops  Area under progeny orchard  Planting Materials  Remarks

**Irrigation Details**

Infrastructure Count

Tubewell

**Figure - 89: National Farmer's Database – Screen 3**

**Crop Details\***

Crop Cycles  Crops Grown  Wheat  Bajra  Rice  Potato  Add  Remove

**LiveStock Details**

Number of Animals  Specifications Animal Type Count Add More Animal Type

**Equipment Details**

Number of Equipments  Specifications Equipment Type Model Make Count Self Financed/ Loan Add Equipments     Self Financed ▾

**Agency Details (Source of Agricultural Inputs)**

Dealer Name  Dealership Type  Wholesale  Retail Valid License Yes ▾

**Figure - 90: National Farmer's Database – Screen 4**

**Agency Details (Source of Agricultural Inputs)**

Dealer Name  Dealership Type  Wholesale  Retail Valid License Yes

Shop No.  State\*  District

Block  Panchayat  Village

Pin Code

**Market Accessed for Agricultural Products**

Name  Address  Add Markets

State\*  District  Block

Panchayat  Village  Pin Code

**Bank Details**

Bank Name  Branch Name  MICR No.  Branch Code  Add More Accounts

Account No.  Account Type Current

**Loan Details**

Add More Loans

Figure - 91: National Farmer's Database – Screen 5

**Loan Details**

Loan Source  Loan Type  Loan Amount(in Rs.)  Mode of Payment

**Insurance Details**

Agency Name  Insurance Type Type1  Insured On

Policy No.  Maturity Date  Premium

Mode of Payment Cash

**Family Economical Status**

Above Poverty Line  Below Poverty Line  Antyodaya Anna Yojana

Annual Income from Farm  Livestock  Fisheries

Others  ,Specify Others

**Source of Knowledge**

State Agriculture Departments  Krishi Vigyan Kendra  State Agricultural Universities  ICAR

Helpline (toll Free numbers)  Meetings  Trainings/ Workshops  T.V.

Radio  SMS  progressive farmers  extension workers

Figure - 92: National Farmer's Database – Screen 6

**Source of Knowledge**

<input type="checkbox"/> State Agriculture Departments	<input type="checkbox"/> Krishi Vigyan Kendra	<input type="checkbox"/> State Agricultural Universities	<input type="checkbox"/> ICAR
<input type="checkbox"/> Helpline (toll Free numbers)	<input type="checkbox"/> Meetings	<input type="checkbox"/> Trainings/ Workshops	<input type="checkbox"/> T.V.
<input type="checkbox"/> Radio	<input type="checkbox"/> SMS	<input type="checkbox"/> progressive farmers	<input type="checkbox"/> extension workers

**Other Details**

House <input type="button" value="Owned"/>	Size of House(sq.m) <input type="text"/>	Category <input type="button" value="SC"/>
Religion <input type="button" value="Hinduism"/>	Minority <input type="button" value="Yes"/>	Man Power for Farming <input type="checkbox"/> Self <input type="checkbox"/> Hired
Kisan Credit Card Holder <input type="button" value="Yes"/>		

**Membership in Societies/Groups**

Name <input type="text"/>	Address <input type="text"/>	<input type="button" value="Add More Societies"/>		
State* <input type="button" value="Select State"/>	District <input type="button" value="Select District"/>	Block <input type="button" value="Select Block"/>		
Panchayat <input type="button" value="Select Panchayat"/>	Village <input type="button" value="Select Village"/>	Pin Code <input type="text"/>		
Membership No. <input type="text"/>	Issue Date <input type="text"/>	Validity Date <input type="text"/>		
<input type="button" value="Submit"/> <input type="button" value="Reset"/>				

Figure - 93: National Farmer's Database – Screen 7

**National Farmers' Database Form (Part-II)**

Form to be filled every agricultural season

Season <input type="button" value="Select Season"/>	Year <input type="button" value="Select Year"/>																						
Information on inputs																							
Farming Type <input type="button" value="Select Type"/>	Crops Sown <input type="button" value="Select Crops"/>	Area Sown <input type="text"/>	Pest Occurrence <input type="text"/>																				
Labor <input type="text"/>	Water Sources Used <input type="button" value="Tubewell&lt;br/&gt;River&lt;br/&gt;Pond"/>	Machinery Used <input type="button" value="Select Machinery"/>																					
<table border="1"> <tr> <td><input type="button" value="+/-"/></td> <td>Seed Type <input type="button" value="Select Type"/></td> <td>Seed Variety <input type="button" value="Select Variety"/></td> <td>Quantity <input type="text"/></td> <td>Unit <input type="button" value="Unit"/></td> <td>Source of Procurement <input type="button" value="Select Source"/></td> <td>State <input type="button" value="Select State"/></td> <td>District <input type="button" value="Select District"/></td> <td>Block <input type="button" value="Select Block"/></td> <td>Outlet Address <input type="button" value="Select Outlet"/></td> </tr> <tr> <td><input type="button" value="+/-"/></td> <td>Select Type <input type="text"/></td> <td>Select Variety <input type="text"/></td> <td><input type="button" value="Unit"/></td> <td><input type="button" value="Select Source"/></td> <td>Select State <input type="text"/></td> <td>Select District <input type="text"/></td> <td>Select Block <input type="text"/></td> <td>Select Outlet <input type="text"/></td> <td></td> </tr> </table>				<input type="button" value="+/-"/>	Seed Type <input type="button" value="Select Type"/>	Seed Variety <input type="button" value="Select Variety"/>	Quantity <input type="text"/>	Unit <input type="button" value="Unit"/>	Source of Procurement <input type="button" value="Select Source"/>	State <input type="button" value="Select State"/>	District <input type="button" value="Select District"/>	Block <input type="button" value="Select Block"/>	Outlet Address <input type="button" value="Select Outlet"/>	<input type="button" value="+/-"/>	Select Type <input type="text"/>	Select Variety <input type="text"/>	<input type="button" value="Unit"/>	<input type="button" value="Select Source"/>	Select State <input type="text"/>	Select District <input type="text"/>	Select Block <input type="text"/>	Select Outlet <input type="text"/>	
<input type="button" value="+/-"/>	Seed Type <input type="button" value="Select Type"/>	Seed Variety <input type="button" value="Select Variety"/>	Quantity <input type="text"/>	Unit <input type="button" value="Unit"/>	Source of Procurement <input type="button" value="Select Source"/>	State <input type="button" value="Select State"/>	District <input type="button" value="Select District"/>	Block <input type="button" value="Select Block"/>	Outlet Address <input type="button" value="Select Outlet"/>														
<input type="button" value="+/-"/>	Select Type <input type="text"/>	Select Variety <input type="text"/>	<input type="button" value="Unit"/>	<input type="button" value="Select Source"/>	Select State <input type="text"/>	Select District <input type="text"/>	Select Block <input type="text"/>	Select Outlet <input type="text"/>															
<table border="1"> <tr> <td><input type="button" value="+/-"/></td> <td>Type <input type="button" value="Fertilizer&lt;br/&gt;Pesticide"/></td> <td>Name of Fertilizer/ Pesticide <input type="button" value="Select Name"/></td> <td>Quantity <input type="text"/></td> <td>Unit <input type="button" value="Unit"/></td> <td>Purchased from Dealer/ Agency Name <input type="button" value="Select Source"/></td> <td>State <input type="button" value="Select State"/></td> <td>District <input type="button" value="Select District"/></td> <td>Block <input type="button" value="Select Block"/></td> <td>Outlet Address <input type="button" value="Select Outlet"/></td> </tr> <tr> <td><input type="button" value="+/-"/></td> <td>Fertilizer <input type="text"/></td> <td>Select Name <input type="text"/></td> <td><input type="button" value="Unit"/></td> <td><input type="button" value="Select Source"/></td> <td>Select State <input type="text"/></td> <td>Select District <input type="text"/></td> <td>Select Block <input type="text"/></td> <td>Select Outlet <input type="text"/></td> <td></td> </tr> </table>				<input type="button" value="+/-"/>	Type <input type="button" value="Fertilizer&lt;br/&gt;Pesticide"/>	Name of Fertilizer/ Pesticide <input type="button" value="Select Name"/>	Quantity <input type="text"/>	Unit <input type="button" value="Unit"/>	Purchased from Dealer/ Agency Name <input type="button" value="Select Source"/>	State <input type="button" value="Select State"/>	District <input type="button" value="Select District"/>	Block <input type="button" value="Select Block"/>	Outlet Address <input type="button" value="Select Outlet"/>	<input type="button" value="+/-"/>	Fertilizer <input type="text"/>	Select Name <input type="text"/>	<input type="button" value="Unit"/>	<input type="button" value="Select Source"/>	Select State <input type="text"/>	Select District <input type="text"/>	Select Block <input type="text"/>	Select Outlet <input type="text"/>	
<input type="button" value="+/-"/>	Type <input type="button" value="Fertilizer&lt;br/&gt;Pesticide"/>	Name of Fertilizer/ Pesticide <input type="button" value="Select Name"/>	Quantity <input type="text"/>	Unit <input type="button" value="Unit"/>	Purchased from Dealer/ Agency Name <input type="button" value="Select Source"/>	State <input type="button" value="Select State"/>	District <input type="button" value="Select District"/>	Block <input type="button" value="Select Block"/>	Outlet Address <input type="button" value="Select Outlet"/>														
<input type="button" value="+/-"/>	Fertilizer <input type="text"/>	Select Name <input type="text"/>	<input type="button" value="Unit"/>	<input type="button" value="Select Source"/>	Select State <input type="text"/>	Select District <input type="text"/>	Select Block <input type="text"/>	Select Outlet <input type="text"/>															

Figure - 94: National Farmer's Database – Screen 8

The screenshot displays a web-based application titled "Farmers' Database Performa Part II". The interface is organized into several sections:

- Fertilizer Purchase Details:** A table with columns for Type (Fertilizer), Name of Fertilizer/Pesticide, Quantity, Unit, Purchased from Dealer/ Agency Name, State, District, Block, and Outlet Address. The "Type" field is set to "Fertilizer" and the "Name of Fertilizer/Pesticide" field has "Select Name" dropdown.
- Information on Production, Income, Expenditure and Insurance:** A table with columns for Crop, Crop Production, Crop Income(in Rs.), Expenditure (in Rs.), Agency Name, Type of Insurance, Insured on, Policy No, Date of Maturity, Premium, and Payment Mode. The "Crop" field has "Select Crop" dropdown.
- Farming and Harvesting Details:** A table with columns for Farming Type, Crop Produce, Crop Pattern, Area/ Number(in hectares), Survey No., Sub Survey No., Expected Quantity, Quantity, Unit, Expected Month of Harvest, and Expected Year of Harvest. The "Farming Type" field has "Select Type" dropdown.
- Facilities:** A table with columns for Facility, Name, and Distance from Pt. of Production(in Kms.). The "Facility" field has "Select Facility" dropdown.

**Figure - 95: National Farmer's Database – Screen 9**

## 9 Common Functional Requirements and Use Cases

### 9.1 Common Functional Requirements

#### 9.1.1 Printing (PR)

##### Module: Printing

**Objective:** The printing module is proposed to be a generic configurable module that would enable the users to print the information provided.

##### Functionalities:

PR-FR1. The system shall enable the print link once the registration number has been allotted

- PR-FR2. The system shall pop-up the printer friendly page after the print link is clicked upon
- PR-FR3. The system shall close the pop-up window, if the user wants to cancel the print.
- PR-FR4. System shall pop-up windows print command menu after selection of print command on printer friendly page

Input Format	Description
Print Command	None
Output Format	Description
Successful Print	Acknowledgement of successful print
Technical error	Reason for technical error

### 9.1.2 MIS Reports (MISR)

#### Module: Management Information System Reports

**Objective:** The MIS reports module would be used by the officers at the state and sub – state level offices. The officers would be able to set and select the input parameters and derive the results in the form of MIS reports.

#### Functionalities:

- MISR-FR1. The system shall allow the user to select the period for generating the report
- MISR-FR2. The system shall allow the user to set the parameters for reports
- MISR-FR3. The system shall allow the user to view the report
- MISR-FR4. The system shall allow the user to save previous searches
- MISR-FR5. The system shall allow the user to preset periodic reporting
- MISR-FR6. The system shall allow the user to email reports
- MISR-FR7. The system shall allow the user to print the report
- MISR-FR8. The system shall allow the user to download the report

Input Format	Description
Search Criteria	Keywords in alphabetical text
Output Format	Description
MIS Report	As per the prescribed format

### 9.1.3 SMS Management (SMSM)

<b>Module:</b> Short Messaging Service Management	
<p><b>Objective:</b> As envisioned in the Agriculture MMP, it would be required that the outputs from a number of applications are available through mobile devices of end beneficiaries, as well as officers at various sub – state levels are able to data enter fields through the use of USSD technology. To enable this SMS management module is proposed to register mobile devices for the use of delivering services.</p>	
<p><b>Functionalities:</b></p> <ul style="list-style-type: none"> <li>SMSM-FR1. The system shall allow the user to key in data to register mobile devices</li> <li>SMSM-FR2. The system shall generate a unique reference number for registered mobile devices</li> <li>SMSM-FR3. The system shall allow the users to choose the information that they would like to view</li> <li>SMSM-FR4. The system shall allow the users to send queries to other linked applications via SMS</li> <li>SMSM-FR5. The system shall allow the officers to enter data using USSD technology</li> <li>SMSM-FR6. The system shall allow the users to extract information based on specific codes</li> <li>SMSM-FR7. The system shall allow administrators to delete registered users</li> <li>SMSM-FR8. The system shall allow administrators to change information catalogues</li> </ul>	
Input Format	Description
User Details	Alpha numeric characters
Mobile Number	Numeric characters
Output Format	Description
Registration Number	As per the prescribed format

### 9.1.4 Email Management (EM)

<b>Module:</b> Email	
<p><b>Objective:</b> The email module would allow for registration of users, creation of distribution listing and deletions from the distribution lists.</p>	
<p><b>Functionalities:</b></p> <ul style="list-style-type: none"> <li>EM-FR1. The system shall provide the user with email editor.</li> </ul>	
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- EM-FR2. The system shall allow the user to enter the email addresses in “To”, and “BCC” fields.
- EM-FR3. The system shall provide the user with the option of sending other documents as an attachment with the email.
- EM-FR4. The system shall auto generate email to concerned experts about the query submission by applicant or forwarded by other experts

Input Format	Description
<b>Receiver Email Address</b>	Alpha numeric characters
Output Format	Description
<b>None</b>	None

### 9.1.5 Payment Gateway (PG)

#### Module: Payment Gateway

**Objective:** For the proposed solution in the Agriculture MMP, it is envisaged that external stakeholders including farmers and the private sector would be able to make payments for paid services in the MMP, through an online platform to facilitate faster processing of the application. For this purpose a payment gateway is proposed in the MMP solution which would in turn link to the external payment gateway's of banks and financial institutions.

#### Functionalities:

- PG-FR1. The system should allow the user to enter the details of the payment method
- PG-FR2. The system should allow the user to select the type of payment method
- PG-FR3. The system should allow the user to reset the payment details
- PG-FR4. The system should allow the user to enter the amount in Indian Rupees
- PG-FR5. The system should allow the user to submit the payment on the gateway
- PG-FR6. The system should allow the user to select the payment gateway through which they want to make the payment
- PG-FR7. The system should acknowledge in case payment has been made successfully
- PG-FR8. The system should prompt the user in case the payment has not been made successfully
- PG-FR9. The system should display a message in case there is a technical error
- PG-FR10. The system should allow the user to retrieve previous transactions period wise
- PG-FR11. The system should allow the user to delete previous transaction records
- PG-FR12. The system should send a payment confirmation request to the users registered mobile phone via SMS

Input Format	Description
<b>Payment Details (Credit / Debit / Cash Card, Direct Debit)</b>	As per the prescribed format of the bank or financial institution who's gateway is being used
Transaction Data	As per the prescribed format for the usage
Output Format	Description
<b>Successful Payment</b>	Acknowledgement of successful payment
<b>Unsuccessful Payment</b>	Reason for unsuccessful payment
<b>Technical Error</b>	Reason for technical error
<b>Data Reset</b>	Acknowledgement of successful submission of data

## 9.2 Common Use Cases

### 9.2.1 Use case for Create/Modify Language Pack

Use Case Field	Description
<b>Use Case ID</b>	UC-LNGPACK
<b>Use Case Name</b>	<b>Create/Modify Language Package</b>
<b>Actor(s)</b>	User Manager with the assigned privilege of Create/Modify Language Package
<b>Description</b>	<p>This use case allows actor to create/modify language package for CAP Applications and CAP. It provides an interface using which the actor can provide equivalent translations from English or already created language packages.</p> <p>The language package once saved would be made available to all CAP applications including the CAP and hence these would be available for use by the application's users through <b>Switch Language</b> Use Case.</p> <p>While creating a new language package, actor may choose the existing available language package and modify it to create new language package or create a fresh language package.</p>

Use Case Field	Description
	<p>While creating/modifying a language package system would give provision for the translation of :</p> <ul style="list-style-type: none"> <li>• Common Labels and Messages( translations to be made available across CAP applications)</li> <li>• Common Masters ( translations to be made available across CAP applications)</li> <li>• CAP application specific ( translations to be made available for respective CAP application)</li> </ul> <p>As soon as the language packages are saved, CAP application specific labels will be made available in the respective CAP application, while Common Labels and Messages and Common Masters will be made available across CAP applications for use.</p> <p>The translated version will be available for use by the CAP application through <b>Switch Language Use case</b> after it is successfully published by the actor.</p> <p>Saved language packages will be available for modification only to the actors who have created them.</p>
<b>Pre Conditions</b>	The actor is logged into CAP and is viewing the Main page of CAP application or CAP.
<b>Triggers</b>	Actor chooses to create/modify a language package.
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>1. The System displays two options for the actor under Manage Language Package option             <ol style="list-style-type: none"> <li>a. Create language package</li> <li>b. Modify language package</li> </ol> </li> <li>2. Actor chooses to Create Language Package.</li> <li>3. System prompts the actor to select ‘From Language’ and ‘To Language’ fields. These fields would be available as drop boxes populated with the list of UNICODE supported languages.</li> <li>4. Further system would prompt the actor to either select or enter the ‘From Language Package’ field and either select or enter the ‘To Language Package’ field. These fields would be available as drop boxes populated with the list of Language Packages already created under the selected ‘From Language’ and ‘To Language’ languages respectively.</li> </ol>

Use Case Field	Description
	<p>5. The System presents a screen to the actor to translate the following Language Package elements available in the selected From language to the selected To language :</p> <ul style="list-style-type: none"> <li>a. Common Labels and Messages – All labels and messages that would be used commonly across all CAP applications would be available for translation.</li> <li>b. Common Masters - All Common Masters that would be used commonly across all CAP applications would be available for translation.</li> </ul> <p><b>Sub services specific translation-</b></p> <ul style="list-style-type: none"> <li>c. Pesticides - All Labels, Messages and Masters that would be used within the Pesticides sub service would be available for translation.</li> <li>d. Fertilizers - All Labels, Messages and Masters that would be used within the Fertilizers sub service would be available for translation.</li> <li>e. Seeds - All Labels, Messages and Masters that would be used within the Seeds sub service would be available for translation.</li> <li>f. Soil Health - All Labels, Messages and Masters that would be used within the Soil Health service would be available for translation.</li> <li>g. Crop pests, Insects &amp; Diseases - All Labels, Messages and Masters that would be used within the Crop pests, Insects &amp; Diseases sub service would be available for translation.</li> <li>h. Farm Machinery- All Labels, Messages and Masters that would be used within the Farm Machinery sub service would be available for translation.</li> <li>i. Training- All Labels, Messages and Masters that would be used within the Training service component would be available for translation.</li> <li>j. GAP and POPs- All Labels, Messages and Masters that would be used within the service component called GAPs and POPs would be available for translation.</li> <li>k. Weather Forecasting - All Labels, Messages and Masters</li> </ul>

Use Case Field	Description
	<p>that would be used within the Weather Forecasting &amp; Agro met advisory service would be available for translation.</p> <ul style="list-style-type: none"> <li>l. Information on Prices and Arrivals- All Labels, Messages and Masters that would be used within the service component called Prices and Arrivals would be available for translation.</li> <li>m. Information on Procurement Prices- All Labels, Messages and Masters that would be used within the service component called Procurement Prices would be available for translation.</li> <li>n. Information on interactive platform- All Labels, Messages and Masters that would be used within the service component called “providing information on interactive prices” would be available for translation.</li> <li>o. Electronic certification for imports and exports - All Labels, Messages and Masters that would be used within the application of electronic certification for imports &amp; exports would be available for translation,</li> <li>p. Marketing infrastructure - All Labels, Messages and Masters that would be used within the service of marketing infrastructure would be available for translation.</li> <li>q. Scheme and Programs- All Labels, Messages and Masters that would be used within the service of Monitoring Implementation/Evaluation of Schemes and Programs would be available for translation.</li> <li>r. Fisheries- All Labels, Messages and Masters that would be used within the service of providing information on fishery inputs would be available for translation.</li> <li>s. Drought Relief and Management- All Labels, Messages and Masters that would be used within the service of drought relief and management would be available for translation.</li> <li>t. Irrigation infrastructure- All Labels, Messages and Masters that would be used within the service of Irrigation infrastructure would be available for translation.</li> <li>u. Livestock Management- All Labels, Messages and Masters that would be used within the service of livestock</li> </ul>

Use Case Field	Description
	<p>management would be available for translation.</p> <ol style="list-style-type: none"> <li>6. In case actor has selected the ‘To Language Package’ field than system populates the available translations under the selected value of ‘To Language Package’ in editable mode.</li> <li>7. Actor may do the required modifications and saves it with new Language Package name.</li> <li>8. In case actor has entered the ‘To Language Package’ field than actor enters the fresh version of translations and saves. System saves the Language Package name as per the ‘To Language Package’ entered value.</li> <li>9. The System displays the message “The language package was saved successfully”.</li> <li>10. Actor confirms the message.</li> <li>11. The System returns back to Pre Condition.</li> </ol>
<b>Alternative Flows</b>	<ol style="list-style-type: none"> <li>1. Actor chooses to Modify Language Package in Step 2 of Normal Flow.</li> <li>2. System displays the list of saved language package names.</li> <li>3. The actor chooses a language package which he/she desires to modify.</li> <li>4. System displays the translations done while saving the language package for modification. However in case actor have entered the ‘TO LANGUAGE PACKAGE’ field while creating the language package, same would now be available in read only and cannot be modified.</li> <li>5. Actor may modify translations for one or more elements and saves.</li> <li>6. “The language package was saved successfully”.</li> </ol>
<b>Post Conditions</b>	<ol style="list-style-type: none"> <li>1. Saved Language Packages saved in the database and are available for further modification through <b>Modify Language Package</b> option and for use through <b>Switch Language</b> use case.</li> <li>2. As soon as the language packages are saved CAP application specific translations will be made available in the respective CAP application, while Common Labels and Messages and Common Masters translations will be made available across CAP applications for use.</li> <li>3. As soon as new language package is created, its name would start reflecting in the ‘From Language Package’ drop box list.</li> <li>4. Audit Log is updated with the operation.</li> </ol>

Use Case Field	Description
Exceptions	<p><b><u>Actor attempts to save, without selecting/entering the FROM LANGUAGE PACKAGE value:</u></b></p> <p>The system would respond with an error message “FROM LANGUAGE value is neither selected nor entered.”</p> <p><b><u>Actor attempts to save, without selecting/entering the TO LANGUAGE PACKAGE value:</u></b></p> <p>The system would respond with an error message “TO LANGUAGE PACKAGE value is neither selected nor entered.”</p> <p><b><u>Actor attempts to save, without entering the Language Package name, then</u></b></p> <p>The system would respond with an error message “Language Package name is not entered.”</p> <p><b><u>Entered Language Package name already exists:</u></b></p> <p>The system would respond with an error message “Language Package name already exists”.</p>
Business Rules	<ol style="list-style-type: none"> <li>1. Language Package name will be unique.</li> <li>2. FROM LANGUAGE, TO LANGUAGE, FROM LANGUAGE PACKAGE, TO LANGUAGE PACKAGE, Language Package name fields are mandatory.</li> <li>3. Default value of ‘From Language’ field would be ENGLISH.</li> <li>4. Common labels and messages translations should be made available across CAP applications for use through Switch Language use case.</li> <li>5. As soon as the language packages are saved CAP application specific translations will be made available in the respective CAP application, while Common Labels and Messages and Common Masters translations will be made available across CAP applications for use through <b>Switch Language</b> use case.</li> <li>6. As soon as new language package is saved, its name would start reflecting in the ‘From Language Package’ drop box list.</li> <li>7. In case any Labels/Master data values/Master fields/Messages are not translated under the created Language Package, and while such language</li> </ol>

Use Case Field	Description
	<p>package is used through <b>Switch Language</b> option then all such untranslated labels would appear in default English language only.</p> <p>8. CAP application specific translations should be done by respective application's System administrator and should be made available for use to the respective CAP application.</p> <p>9. Saved language packages will be available for modification only to the actors who have created them.</p> <p>10. The indicative list for Common Labels and Messages that needs translations is being specified below for reference:</p> <ul style="list-style-type: none"> <li>i. Do you wish to clear all the content entered in the form?</li> <li>ii. Do you wish to Cancel the operation?</li> <li>iii. Do you wish to Close the page?</li> <li>iv. File was attached successfully.</li> <li>v. File Type not allowed for upload?</li> <li>vi. File Size(s) has exceeded the Upload Limit.</li> <li>vii. The selected file could not be uploaded as it was virus infected and could not be cleaned. Please select another file.</li> <li>viii. Proceed with dropping the selected files?</li> <li>ix. Allowed File Type(s)</li> <li>x. Copyright Type</li> <li>xi. Allowed to reproduce with written acknowledgement</li> <li>xii. Allowed to reproduce with prior permission.</li> <li>xiii. Not allowed to reproduce in any form</li> <li>xiv. File Upload Limit</li> <li>xv. Drop Attachment</li> <li>xvi. Common Labels and Messages</li> <li>xvii. Common Masters</li> <li>xviii. CAP Application wise Labels and Messages</li> <li>xix. Create language package</li> <li>xx. Modify language package</li> <li>xxi. Manage Language Package</li> <li>xxii. Clear</li> <li>xxiii. Cancel</li> </ul>

Use Case Field	Description
	<p>xxiv. Back  xxv. Print  xxvi. Close  xxvii. Add Attachment  xxviii. Drop Attachment</p> <p>11. The complete list of labels, messages and masters elements that needs translations under the language package would be derived as per the following business rules:</p> <ul style="list-style-type: none"> <li>a. Common Labels and Messages – All labels and messages that are needed to be used commonly across all CAP applications should be made available for translation i.e. as per the SLA.</li> <li>b. Common Masters - All Common Masters (including data values/fields) that are needed to be used commonly across all CAP applications should be made available for translation i.e. as per the interface requirement section written in the SLA.</li> <li>c. Steps c to p of the normal flow.</li> </ul> <p>12. In case any translations or Transliterations are done while a label/message/master data value/master fields is being created in the respective CAP application, then same should be available in all the Language Packages (available for the translated UNICODE language) for further modification by the actor. Translations or Transliterations would be as defined in the SLA.</p>
<b>Relationships</b>	<p><b><u>Extends</u></b>  View System Administration Page of respective CAP application or CAP Page</p> <p><b><u>Is Extended By</u></b>  Switch Language</p> <p><b><u>Uses</u></b>  Login</p>
<b>Special Requirements</b>	<ul style="list-style-type: none"> <li>i. CAP will support only those language versions that are <b>UNICODE</b> enabled and use <b>UNICODE</b> enabled fonts.</li> <li>ii. Transliteration of the label/message/master data value/master fields</li> </ul>

Use Case Field	Description
	<p>would be done as specified in respective CAP application's requirement documents. However Transliteration would be limited to the languages for which the transliteration option is available.</p> <ul style="list-style-type: none"> <li>iii. For user's ease, pagination to be used while displaying the list of elements available for translations.</li> </ul>
<b>Assumptions</b>	<p>There would be default system generated Language Package available in system with the following details:</p> <ul style="list-style-type: none"> <li>i. Language Package name – English</li> <li>ii. From Language – English</li> <li>iii. To Language – English</li> <li>iv. Common Labels and Messages – With all labels and messages that would be used commonly across all CAP applications in English.</li> <li>v. Common Masters – With all Common Masters that would be used commonly across all CAP applications in English.</li> </ul>
<b>Outstanding Issue</b>	None

### 9.2.2 Use Case - Switch Language

Use Case Field	Description
	<b>CAP User, General Citizen</b>
	<p>This use case will allow the actor to view the _____ in one of the supported languages that is different from the language in which she is currently viewing. All fixed text on screens, drop down list of values, any error or warning messages generated by _____ and help text will be displayed in the chosen language.</p>
	<p>The Actor is either viewing the default page of CAP before log in or any of the screens of CAP (which are available after login) in one of the languages supported by the package.</p>

Use Case Field	Description
	The actor chooses a language from the list of languages supported by the CAP.
	<ol style="list-style-type: none"> <li>1. The system would display the list of all languages supported by CAP.</li> <li>2. The actor would be able to select one language from the list of displayed languages.</li> <li>3. The current page and all subsequent pages will be displayed in the selected language. All fixed text on screens, drop down list of values, any error or warning messages generated by CAP and help text would be translated in the chosen language.</li> <li>4. The system would issue an informational message, “To enter data in the selected language, please set the language in your machine”.</li> <li>5. For logged in CAP users, system would additionally prompt the following messages to the actor:           <ol style="list-style-type: none"> <li>i) System would prompt actor “Do you wish to set this as your default language?” In case actor confirms, system sets the default language of the actor as per the selected Language Package.</li> </ol> </li> </ol>
	<b>None</b>
	<ol style="list-style-type: none"> <li>1. The selected language becomes the current language of the CAP for the actor till he/ she switches to another language or quits the CAP either by logging out or her session times out.</li> <li>2. This has the implication that all fixed text on screens; drop down list of values, any error or warning messages generated by CAP and help text will be displayed in the chosen language. This of course applies only to those items that have been translated.</li> <li>3. For actor as logged in CAP user, system sets the default language of his/her User ids as per his/her confirmation.</li> </ol>
	<b>High</b>
	<ol style="list-style-type: none"> <li>1. CAP will display labels as per the following logic to ensure that labels/help text is always available in at least one language:           <ol style="list-style-type: none"> <li>a. Display all the /labels/masters/messages text on screens, as translated while creating the selected language package are displayed to the actor.</li> </ol> </li> </ol>

Use Case Field	Description
	<p>b. In case no translation(s) is available in current language for some or all labels, then display those label(s) in default English language.</p> <p>2. The list under Switch Language option would show all the language package names as created through Create/Modify Language Package use case.</p>
	<p><b><u>Extends</u></b> Main page of CAP.</p> <p><b><u>Is Extended By</u></b> None.</p> <p><b><u>Uses</u></b> Login, if the actor has logged in to the portal.</p>
	<p>will support entry and display of languages that have</p> <ul style="list-style-type: none"> <li>a. UNICODE enabled fonts.</li> <li>b. Both Latin and non-Latin scripts such as Hindi, Tamil etc.</li> <li>c. That read from left to right</li> </ul>
	The Default language of the CAP would always be English.

### 9.2.3 Use Case: Manage Alerts

Use Case Field	Description
<b>Use Case ID</b>	UC
<b>Use Case Name</b>	<b>Manage Alerts</b>
<b>Primary Actor (s)</b>	CAP Portal User who has been given privileges in one or more CAP application(s).
<b>Secondary Actor (s)</b>	NA
<b>Description</b>	<p>This use case would allow the actor to manage alerts in the system. The Alerts will be related to any information which needs actor's attention/action.</p> <p>Alerts would be displayed to the actor on the homepage of the CAP portal or CAP application as soon as he/she logs into the system. Any alerts coming to the actor would be saved against his/her user id and would be available under View Alerts list. The View Alerts page would be displayed as soon as the actor logs in.</p>

Use Case Field	Description
	<p>The system would flag all new alerts received post his/her last login as new in the View Alerts list.</p> <p>Alert can also displayed to him/her anytime on the CAP application screen as soon as any trigger event(s) occur while he/she is already logged in.</p> <p>Actor would have the following options under Manage Alerts :</p> <ul style="list-style-type: none"> <li>a. View Alerts</li> <li>b. Activate Alert</li> <li>c. Deactivate Alert</li> </ul> <p>The Actor would be able to further take the following actions on the various alerts under View Alerts option :</p> <ul style="list-style-type: none"> <li>• Snooze alert</li> <li>• Remove Alert</li> <li>• Show this alert</li> </ul> <p>In case actor is viewing the alert triggered by the system on his/her screen, he/she would be provided with the following more options besides the above mentioned options:</p> <ul style="list-style-type: none"> <li>• Ignore Alert</li> <li>• Never show this alert</li> </ul>
<b>Pre Conditions</b>	<p>The actor must have access to the application domain and should login into the CAP Portal or specific CAP Application.</p> <p>Actor clicks on Manage Alerts.</p> <p>Or</p> <p>The alert is triggered and displayed on the screen by the system, and actor then choose to take any of the following action on the alert:</p> <ul style="list-style-type: none"> <li>• Snooze alert</li> <li>• Ignore Alert</li> <li>• Never show this alert</li> </ul>
<b>Triggers</b>	The actor chooses to Manage Alerts.
<b>Normal Flow</b>	<ol style="list-style-type: none"> <li>1. The System would display the following options to him/her: <ul style="list-style-type: none"> <li>a. View Alerts</li> <li>b. Activate Alerts</li> </ul> </li> </ol>

Use Case Field	Description
	<p>c. Deactivate Alerts</p> <p>2. Actor chooses to View alerts or actor has just logged in and system displays him/her the View Alerts page.</p> <p>3. System display the list of alerts (all new and old alerts triggered at actor's user id) to him/her, with the following actions options:</p> <ul style="list-style-type: none"> <li>a. Snooze alert</li> <li>b. Remove Alert</li> <li>c. Show this alert</li> </ul> <p>In case actor is viewing the alert triggered by the system, system would display all above mentioned options (except Show this alert and Remove Alert) to him/her along with following more options :</p> <ul style="list-style-type: none"> <li>d. Ignore Alert</li> <li>e. Never show this alert</li> </ul> <p>4. The system would flag all new alerts received post his/her last login as new in the View Alerts list.</p> <p>5. Actor chooses to Snooze alert.</p> <p>6. System captures the snooze interval time in minutes.</p> <p>7. The alert gets displayed to the actor at regular intervals as per the snooze interval added by the actor for the alert.</p>
<b>Alternative Flows</b>	<p>Case 1 a :</p> <ol style="list-style-type: none"> <li>1. In case Actor chooses to Remove Alert i.e. selects option b of step 3.</li> <li>2. System displays the confirmation message "Do you want to remove this alert? Click Yes to confirm" with yes or no option. In case actor selects "Yes", system removes the alert and displays the message "Alert has been removed successfully." In case actor selects "No", system returns to the step 3.</li> <li>3. System removes the alert from the View Alerts list.</li> </ol> <p>Case 1 b:</p> <ol style="list-style-type: none"> <li>1. In case Actor chooses to Show this Alert i.e. selects option c of step 3.</li> <li>2. System displays the confirmation message "Alert was successfully added into the Alert list."</li> <li>3. System activates the alert again, and the alert resumes behaving as before marking it as 'Never show this alert' i.e. it again starts appearing to the actor (in future as and when it is triggered).</li> </ol>

Use Case Field	Description
	<p>Case 1 c:</p> <ol style="list-style-type: none"> <li>1. In case Actor chooses to Ignore Alert i.e. selects option e of step 3.</li> <li>2. System displays the confirmation message “Do you want to Ignore this alert?” with yes or no option. In case actor selects “Yes”, system temporarily removes the alert and the alert message vanishes from the actor’s screen. In case actor selects “No”, system continues to display the alert message to him/her.</li> <li>3. System removes the alert appearing on the screen for the time being and alert gets removed from the screen as soon as Ignore alert is clicked.</li> </ol> <p>Case 1 e:</p> <ol style="list-style-type: none"> <li>1. In case Actor chooses to Never Show this Ignore Alert i.e. selects option f of step 3.</li> <li>2. System displays the confirmation message “Do you want to add this alert to Never show this alert list?” with Yes or No option. In case actor selects “Yes”, system auto saves the alert and adds the alert to the Never show this alert list and removes the alert message from the actor’s screen.” In case actor selects “No”, system continues to display the alert message to him/her.</li> <li>3. Alert would be deactivated and would no longer appear to the actor in future unless it is activated through ‘Show this alert’ option.</li> <li>4. The alert would be available in View Alerts list, from where it can be moved back to Show me this Alert list by the actor.</li> </ol> <p>Case II:</p> <ol style="list-style-type: none"> <li>1. Actor chooses to activate alerts.</li> <li>2. System displays the confirmation message “Do you want to Activate alerts?” with “Yes” or “No” option. In case actor selects “Yes”, system activates the alerts for the actor. In case actor selects “No”, system returns to the step 1.</li> <li>3. System activates the alerts for the actor and he/she starts receiving all the alerts.</li> </ol> <p>Case III:</p> <ol style="list-style-type: none"> <li>1. In case actor chooses Deactivate Alerts in Step 2</li> </ol>

Use Case Field	Description
	<p>2. System displays the confirmation message “By Deactivating alerts, you would no longer receive any alerts from the application. Do you want to deactivate alerts? ” with “Yes” or “No” options. In case actor selects “Yes”, system deactivates the alerts for the actor. In case actor selects “No”, system returns to the step 1.</p> <p>3. System deactivates the alerts for the actor and he/she does not receive any further alerts.</p>
<b>Post Conditions</b>	<p>1. If the actor Activates the alerts, system activates the alerts for the logged in actor and he/she starts receiving the alerts on the CAP portal or specific CAP application as the case may be.</p> <p>2. If the actor deactivate the alerts, system deactivates the alerts for the logged in actor and he/she no longer receives any alerts on the CAP portal or specific CAP application as the case may be.</p>
<b>Exceptions</b>	<p><b><u>No Alerts are available in the system for removal/snoozing/marketing to Show this alert :</u></b></p> <p>System displays the message “There are no alerts available in the system”.</p> <p><b><u>Actor attempts to snooze the alert without mentioning the Snooze time:</u></b></p> <p>System displays the message “Please enter the snooze time.”</p>
<b>Priority</b>	<b>Medium</b>
<b>Business Rules</b>	<p>1. System should auto save the alerts which have been marked as “Never show this alert” by the user and should be displayed in the Saved alerts list available under ‘View Alerts’.</p> <p>2. ‘Show This Alert’ option should be enabled only for the alerts which have been marked as ‘Never show this alert’.</p> <p>3. Ignored Alerts will be removed from the screen of the user, but will still be considered as active alert, i.e. such alerts will continue to appear to the user as and when triggered by the system.</p> <p>4. While alerts marked as ‘Never show this alert’ will no longer be displayed to the user unless and until user sets these on through ‘Show this alert’ option.</p> <p>5. Any alerts coming to the actor would be saved against his/her user id and would be available under View Alerts.</p> <p>6. The View Alerts page should be displayed as soon as the actor logs in.</p>

Use Case Field	Description
	<p>7. The system should flag all new alerts received post his/her last login as new in the View Alerts list.</p> <p>8. Depending upon the type of Alert, the various options/actions on an alert would be enabled or disabled (Refer <b>Assumptions</b> section of this use case):</p> <ul style="list-style-type: none"> <li>a. Mandatory Alerts – For such type of alerts, ‘Never Show this alert’ , ‘Ignore Alert’ and ‘Remove Alert ’options should be disabled.</li> <li>b. Optional Alerts (FYI alerts for the actor) – All options as specified in Normal Flow and Alternate flow should be enabled for this alert type.</li> <li>c. Urgent Alerts – For such type of alerts, ‘Never Show this alert’ , ‘Ignore Alert’ , ‘Snooze Alert’ and ‘Remove Alert ’options should be disabled.</li> </ul>
<b>Relationships</b>	<p><b><u>Extends</u></b></p> <ol style="list-style-type: none"> <li>1. View CAP portal</li> </ol> <p>or</p> <ol style="list-style-type: none"> <li>2. View CAP application</li> </ol> <p><b><u>Is Extended By</u></b></p> <p>None.</p> <p><b><u>Uses</u></b></p> <p>Login</p>
<b>Assumptions</b>	<ol style="list-style-type: none"> <li>1. Alert trigger event and logic would be handled/governed by individual CAP application and would be as per the respective SRS of the CAP applications.</li> <li>2. Alert definition or logic as specified in respective CAP application’s SRS would also indicate/specify the Alert Type as defined below: <ul style="list-style-type: none"> <li>a. Mandatory Alerts – These would include those alerts which should be mandatorily viewed by the actor. These types of alerts cannot be deactivated/ignored/removed by the actor. For such type of alerts, ‘Never Show this alert’ , ‘Ignore Alert’ and ‘Remove Alert ’options should be disabled.</li> <li>b. Optional Alerts (FYI alerts for the actor) – These would include those alerts which can be optionally viewed by the actor. All options as specified in Normal Flow and Alternate flow should be enabled</li> </ul> </li> </ol>

Use Case Field	Description
	<p>for this alert type.</p> <p>c. Urgent Alerts – These would include those alerts which need immediate actor's action/attention. For such type of alerts, 'Never Show this alert' , 'Ignore Alert' , 'Snooze Alert' and 'Remove Alert' options should be disabled.</p>
<b>Special Requirements</b>	<ol style="list-style-type: none"> <li>1. Pagination to be used while displaying the alerts under the View Alerts list.</li> <li>2. The alerts should be ordered in descending order, with most recent alert to be made available in the top of the list.</li> <li>3. In case user is already logged in and any new alert is triggered to the him/her, it should be displayed flagged in the bottom left corner of the actor's screen as- One new Alert Received &lt;Alert text&gt;with the applicable option buttons.(Similar to new mail received alert in Outlook, but it should not fade out without actor's intervention).</li> <li>4. Alerts can be sorted by the actor :             <ol style="list-style-type: none"> <li>a. Ascending (Basis Trigger date &amp; time)</li> <li>b. Descending (Basis Trigger date &amp; time)</li> <li>c. Alert Type – Mandatory/Optional/Urgent</li> </ol> </li> </ol>

## 10 Design Constraints

### 10.1 Design Objectives

The focus of Agriculture MMP is on the seamless, anywhere and anytime delivery of prioritized 12 services. The solution will be designed using the industry's best practices as well as using the experiences from similar initiatives executed successfully within the country.

The scope and magnitude of the Agriculture Mission Mode Project is likely to impact the service delivery of at least the identified core services in seven pilot state of India (in the initial phase), with an overarching effect on the current fragmented solutions that have been put in place by Central and State governments.

The following section outlines these objectives from a holistic perspective, keeping in view the requirements of all the stakeholders of the project, as well as the constraints within which the proposed solution would need to operate. The design objectives for the proposed technology solution in Agriculture MMP are:

1. Adopt service oriented architecture
2. Develop and expose business functionality as services
3. Provide web based user interface
4. Support multiple access devices such as desktop computers, Mobile phones, PDA, etc.
5. Ensure confidentiality of user data
6. Enable easy discovery of information
7. Allow internal, external and associated agencies access to the online platform
8. Allow farmers and private sector to access services through a '*Single Window*' interface
9. Facilitate delivery of re-engineered manual processes through an online platform
10. Re-use existing and proposed ICT infrastructure in service delivery by integrating existing ICT initiatives

With the above objective in mind, the following section articulates the design considerations that have to be kept in mind during the design of the proposed technology solution.

## **10.2 Design Considerations**

### **10.2.1 Quality of code**

- Portal should use correct Doctype
- Portal should use a Character set
- Portal should use Valid (X)HTML
- Portal should use Valid CSS
- Portal should not use CSS hacks
- Portal should not use unnecessary classes or ids
- Code should be well structured
- Portal should not have any broken links.
- Portal should have good performance in terms of speed/page size
- Portal should not have any JavaScript errors

### **10.2.2 Degree of separation between content and presentation**

- Portal should use CSS for all presentation aspects (fonts, colour, padding, borders etc)
- All decorative images should be included in the CSS.

### **10.2.3 Accessibility for users**

- "alt" attributes to be used for all descriptive images
- Portal should use relative units rather than absolute units for text size

- Any aspects of the layout of the portal should not break if font size is increased or decreased
- Portal should use visible skip menus
- Portal should use accessible forms
- Portal should use accessible tables
- There should be sufficient colour brightness/contrasts
- For critical information other mechanisms should also be used to draw attention of the user in addition to color
- There should not be any delayed responsiveness for dropdown menus (for users with reduced motor skills)
- Links should be descriptive

#### **10.2.4 Accessibility for devices**

- Portal should work acceptably across modern and older browsers
- Content should be accessible with CSS switched off or not supported
- Content should be accessible with images switched off or not supported
- Portal should work in text browsers such as Lynx
- Portal should work well when printed
- Portal should work well in common hand held devices
- Portal should include detailed metadata
- Portal should work well in a range of browser window sizes

#### **10.2.5 Basic usability**

- There should be a clear visual hierarchy
- Heading levels should be easy to distinguish
- Portal should have easy to understand navigation
- Portal should use consistent navigation
- Links should be underlined
- Portal should use consistent and appropriate language?
- Portal should have sitemap page and contact page. These should be easy to find
- Search tool should be available on portal
- There should be a link to the home page on every page of the portal
- Visited links should be clearly defined with a unique colour?

#### **10.2.6 Site management**

- Portal should have a meaningful and helpful 404 error page that works from any depth in the portal

- Portal should have user friendly URL
- URL should work without "www"
- Portal should use only standard favicon (Favorite Icon)

## 10.3 Standards

Central Agricultural Portal should meet global **standards** in best practices, design and functionality. The portal should comply with the following standards-

- (i) Guidelines for Indian Government websites
- (ii) MDDS – Demographic (Person Identification and Land Region Codification)  
Metadata and data standards
- (iii) Localization standards
- (iv) W3C standards level 2
- (v) Open Web Application Security Project (OWASP) standard for Security

The standards to be adopted with respect to various aspects have been discussed in respective the sections of this document.

## 11 Performance Requirements

Performance is defined as the responsiveness. Central Agricultural Portal should manage the user load and response time.

Loading of static pages of the web portal should not take much time and page should be rendered immediately within few seconds. It will take less time (in seconds) for database access/update transactions as well. However, for report generation and query retrieval it may take sufficiently more time depending on data volume and complexity of queries.

The response time for average network connectivity speed should be as follows:

- 90% of the responses for static web pages should be within 2 seconds.
- 5-10 second: For user operation on data (for e.g. sorting of data in a column) or (5 to 50 records per page up to max of 100,000 records)
- 10-20 second: For user awaiting response from the system upon executing a transaction (for e.g. a query/update).
- 1 minute – Unacceptable response time

It would be the key challenge for both Centre and State portals as more and more citizens and States take part in Agriculture MMP initiative and volume of data grows. It is essential that the performance of the portal must not deteriorate with increase in volume of data or number of end users. The proposed architecture should take care of the application level performance requirement by load balancing and caching technique. Size of pages should be such that even on low bandwidth internet connections response time should be satisfactory.

The enterprise level performance should be taken care of by restricting the number of users to consume various services by defining an access control mechanism. However, regular performance tuning initiatives like purging and archiving of data are to be adopted to ensure optimum performance.

## 11.1 Guidelines for realizing performance

Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve high performance –

- a. Design such that deployment can be easily partitioned in terms or layers.
- b. Use clustering and web-farms for deployment
- c. Use proper load balancing algorithms such load gets distributed uniformly on all available nodes within a layer.
- d. Use proper caching mechanism for master data and mostly read data like user profile information, configuration parameters etc
- e. Perform time consuming tasks asynchronously
- f. Most of the application level logging should be disabled in production code.
- g. Code should be optimized using performance analysis tools before deploying in production environment.
- h. SQL statements should be optimized using database server provided tools.

## 12 Portal Functionality Requirements

In addition to user and application specific functionalities, Central Agricultural Portal should provide following portal functionalities-

1. **Metadata Synchronization** – Central Agricultural Portal is required to comply with defined standard for content taxonomy, metadata and master data
2. **Full Text Search** – Provide facility to search the portal content based on full text search approach

3. **Metadata based search** – provide metadata based search facility to search Central Agricultural Portal content
4. **Information Browser** – provide explorer type interface for browsing all information, which is published on the Central Agricultural Portal
5. **Personalization** – This includes user specific customization such as display themes, customization on home page etc.
6. **Portal Usage Reports** – Provide various reports related to usage of portal. This will help to analyze user behavior and content of interest to users
7. **Self Service** – This includes user registration, user profile management. Certain services and functionality may be provided only to registered users
8. **Notifications** – Registered users should be able to subscribe to specified type of content categories. Whenever any content of subscribed categories gets published, subscribed users should be notified by means of email
9. **Portal Administration** – Administration functionality for user management and application administration should be available

## 13 Software Systems Attributes

The following section details out software Systems Attributes for Central Agricultural Portal.

### 13.1 High Availability

High availability refers to a system or component that is continuously operational for a desirably long length of time. It is an ability to withstand failure of individual components. Central Agricultural portal should be highly available. To make NeGP-Agriculture solution to be highly available, it is essential that all components like hardware, network, system software, and application software for NeGP-Agriculture solution are operational all the time. If the system is not available for all the time, user loses his interest and avoids using the service again presuming that it may waste his/her time in accessing the service without any result. Considering the urgency and priority of making agricultural information accessible through CSCs, the system requires high level of availability. From the Centre / State perspective, following applications are of high importance:

- Work flow management for all services (Transaction and workflow based services)
- Centre / State Agricultural Portals
- Grievance management system
- Expert Management System

From the end users' perspective, both at State and Central levels, following applications are the source of agriculture related information and would be a major cause of concern, if the downtime for these applications is more.

- Content Management system
- Knowledge Management System

In order to provide reliable services through Central Agricultural Portal, suitable steps should be taken from design to use. Portal must be provided with the capability to continue its function regardless of external events. Hardware failure, natural disasters and data corruptions should not be allowed to disrupt or stop Central Agricultural Portal activities. System may return error occasionally, but it should respond in a normal manner on retry after reasonable amount of time, typically few seconds. The portal functions must be capable of operating on alternative information delivery mechanisms. The backup plan must be in place to overcome hardware or software failures.

The risks of interruption of operations of Central Agricultural portal must be established in advance and managed. Management includes but is not limited to periodic reviews, testing for vulnerability and exposure, or designing mission-critical services to assure continuous availability through redundant or alternative capabilities. Recoverability, redundancy and maintainability should be addressed right from design time.

The proposed architecture should address these requirements through the use of clustering, load balancing and redundancy built in the architecture

Central Agricultural Portal shall be up and running and must be available 24x7 and any one shall be able to connect to it from anywhere. It shall trap all errors and prevent users from accessing unauthorized areas of the application. In case of application or a hardware failure, the system should re-initiate immediately. In case of a possible hardware failure or corruption of database the system administrator should immediately restore the backup. Central Agricultural Portal should have well defined version and change management plan.

Many of the services of Central Agricultural Portal being critical, it is desirable that it should have reduced Recovery Time Objective (RTO) and Recovery Point Objective (RPO). RTO is defined as the maximum amount of time that an IT-based business process can be down before the organization starts suffering significant material losses. RTO indicates the downtime tolerance of a business process or an organization in general.

The RTO requirements are proportional to the mission-critical nature of the business. Some of services on Central Agricultural Portal will need near zero RTO.

RPO is defined as the maximum amount of data an IT-based business process may lose before causing detrimental harm to the organization. RPO indicates the data-loss tolerance of a business process or an organization in general. This data loss is often measured in terms of time, for example, 5 hours or 2 days worth of data loss. Depending upon criticality of various services, Central Agricultural portal should have near zero RPO.

### **13.1.1 Guidelines for realizing High Availability**

Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve high availability–

#### **a. Network level**

- i. Failover capable network elements such as routers, gateways etc.
- ii. Failover capable firewalls
- iii. Failover capable load balancers/dispatchers
- iv. Define clusters in combination with load balancing and failover to enhance the level of system availability and system response time.

#### **b. Hardware level**

- i. Use load balancing across web servers
- ii. Use application server cluster
- iii. Use data server cluster
- iv. Use RAID enabled data storage

#### **c. COTS software level**

- i. COTS entities deployed as a part of solution should be capable of high availability configuration
- ii. COTS software should support techniques of clustering, load balancing for achieving desired performance levels

#### **d. Application software level**

- i. Categorize all business processes of CAP as
  - a. Business processes with most stringent High Availability requirements with RTO and RPO near to zero
  - b. business processes that can have slightly relaxed High Availability requirements with non-zero RTO and RPO

c. Business processes which need not have the rigorous HA requirements For e.g. processes related to internal development and quality assurance processes

Plan Application architecture as per these requirements

- ii. All file names should be relative
- iii. Do not hardcode IP addresses
- iv. Do not bind anything with 'local host'
- v. Minimize amount of data saved in 'http session object'
- vi. Do not use static variables
- vii. Do not perform write operations on external files
- viii. Client applications that connect to the server application must retry and recover from temporary network failures

**e. General guidelines**

- i. Redundancy: Each element of an application must have a backup that can take over if the primary one fails;
- ii. Recoverable design: Any individual element is more available if it is stateless, but the application as a whole typically is stateful, and state must be preserved across potential failures;
- iii. Failure detection: To be recoverable, application may have to fail gracefully by saving transaction information, notifying a user or administrator, and performing appropriate application cleanup;
- iv. Application must be monitored in real time to ensure it is still running and triggering automatic failover if it isn't;
- v. Operations management integration: Applications may incorporate management APIs to raise alerts, enable full monitoring and management, and write error logs that may also be monitored;
- vi. Connection management: The client part of the application should be designed to handle connection failures and automatically establish connections to alternate providers;
- vii. Transaction-aware design: Application design must explicitly anticipate handling of and recovery from transaction failures.

## 13.2 Scalability

**Scalability** is the ability of a system, network, or process, to handle growing amount of load in a capable manner by means of deploying additional resources, if required, without any noticeable degradation of its performance.

In case of NeGP-Agriculture Mission Mode Project, horizontal as well as vertical scalability is important design consideration, as it is envisaged that the number of end users / CSCs / Private kiosks will increase with more States joining the Agriculture MMP initiative after the pilot roll out. Similarly, the States and Centre will also introduce additional services in due course of time. Central Agricultural Portal should be able to cope up with significant increase in load or page requests, without noticeable degradation in performance, by means of deploying additional hardware but without making any changes in the application software. Scalability should be addressed at each and every component level.

For NeGP-Agriculture Mission Mode Project following measures of Scalability are important-

- Administrative scalability: Number of stakeholder organizations may increase in future
- Functional scalability: New functionality may be needed to added
- Geographic scalability: More nodes may be added in future
- Load scalability: Number of users may increase

To address the scalability challenge, the modular design will be adopted. Proposed architecture will use Service Oriented Architecture (SOA). Interactions among the various services and integration with the existing application will be achieved using XML open standards. There will be a clear cut demarcation between data, business rules, presentation and applications layers. This will enable the implementation team to plug in new applications and new features at any point of time to address the application level scalability requirements.

### **13.2.1 Guidelines for realizing Scalability**

Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve scalability –

- a. Make software and layout design highly modular.
- b. The solution should be developed using layered architecture with components spread across different architectural layers including hardware such as servers, storage, routers, physical networks, system software, as well as custom software/application.
- c. In the web server layer, provision should be there to add another instance of web server parallel to the existing web servers. The requests to all these servers may be balanced by a Load Balancer.
- d. The application server instances will be clustered for high availability and scalability.

- d. In the data layer, to serve the data requests in parallel, multiple instances of database must be deployed. Based on the load and other parameters, one can plan the clustering of underlying data sources.
- e. The data archival and purging based on the requirement will also improve the scalability of the application.

## 13.3 Interoperability

**Interoperability** is the ability of diverse systems and organizations to work together (interoperate). Interoperability is a property of a product or system, whose interfaces are completely understood, to work with other products or systems, present or future, without any restricted access or implementation. The interfaces of Central Agricultural Portal should be properly exposed to make it interoperable.

CAP will interact with different systems which are already implemented. There will be flow of information among the heterogeneous applications (For e.g. AGMARKNET, SEEDNET, PQIS, CROP etc. which are built on different technology platforms) and across States and Centre Agriculture Portals. The proposed architecture of Central Agricultural Portal is built around the web services standard and adopts open standards for interacting with various applications to address the interoperability requirement.

Interoperability also means the ability of software and hardware to work on different machines from different vendors and to share data. Central Agricultural Portal is envisaged to deliver the services to the farmers and other stakeholders through various delivery channels. Hence it must be interoperable within diverse networks to enable users to easily locate the content and services that meet their needs. To achieve this Central Agricultural Portal should be compatible with most commonly available devices, operating systems, web browsers etc.

### 13.3.1 Guidelines for realizing Interoperability

Interoperability should be achieved primarily by means of using an open standard based interface or a defined standard based interface. Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve Interoperability–

- a. Central Agricultural portal should follow standard technologies and techniques, data models and interfaces
- b. Standards must be taken into account from the inception of the Central Agricultural Portal

- c. Vendor-specific extensions to the standard Web technologies (XHTML, HTML, JavaScript) should be avoided.
- d. Any Website functionality that requires the download and installation of extra technology (e.g. plug-ins) should be avoided.
- e. The metadata model should comply with Dublin Core
- f. Distributed search of site may use page-level Meta tags, a site map and/or site search tool
- g. Distributed search of catalogues and databases may use SRW/SRU
- h. A site-level metadata profile should exist.
- i. External interfaces should be documented
- j. Give clear message about specifications, compatibility and conformance requirement of the application
- k. Information about Version and revision number of the implemented specifications needed should be made accessible, so that participating systems can take care of these.
- l. Use Web services to integrate with existing applications
- m. Use Web services to integrate with external applications
- n. Use web services to integrate with "Centralized Meta Data Repository"
- o. COTS products used for implementing Central Agricultural Portal must support import and export of data using either open standards or XML format.
- p. Browser based interface to Content Repository should be based on XML
- q. CAP should work with most common Operating systems, web browsers, access devices like computers, laptops, mobiles

## 13.4 Reliability

Software Reliability is an important attribute of software quality. Reliability is the probability of failure-free software operation for a specified period of time in a specified environment. Due to any human interventions, the system should not behave abnormally.

Software failures may be due to errors, ambiguities, oversights or misinterpretation of the specification that the software is supposed to satisfy, carelessness or incompetence in writing code, inadequate testing, incorrect or unexpected usage of the software or other unforeseen problems.

It is expected that there shall not be any bug while operating Central Agricultural Portal and the system shall be tested on end cases to offer user a quality and reliable package.

### 13.4.1 Guidelines for realizing Reliability

- a. Before the deployment of Central Agricultural Portal it must undergo testing, verification and validation steps.
- b. After deployment of the Central Agricultural portal, field data can be gathered and analyzed to study the behavior of software defects.

## 13.5 Usability

Usability is a **quality attribute** that assesses how easy user interfaces are to use. Compromising user friendliness leads to loss of productivity. Central Agricultural Portal should be easy to use. The underlying technology should be transparent to users, so they can concentrate on tasks at hand. Screens should be designed for ease of use by non technical users who do not have any computer knowledge. The GUI design shall be intuitive and task-based without any superfluous design.

Usability is defined by 5 quality components:

- **Learnability:** How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency:** Once users have learned the design, how quickly can they perform tasks?
- **Memorability:** When users return to the design after a period of not using it, how easily can they reestablish proficiency?
- **Errors:** How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- **Satisfaction:** How pleasant is it to use the design?

### 13.5.1 Guidelines for realizing usability

The design should adopt the following principles:

- Present the information to the user in a clear and concise way.
- To give the correct choices to the users, in a very obvious way.
- To remove any ambiguity regarding the consequences of an action e.g. clicking on delete/remove/purchase.
- Put the most important thing in the right place on a web page or a web application.
- Central Agricultural Portal should have common “look and feel” and support ergonomic requirements.

- Use relative font size so that a user can easily change overall font size from the browser interface.
- Text equivalents should be given for all graphics.
- Application should function even if JavaScript, CSS and Frames are turned off.
- Navigability –The user should be able to perform operations without having to navigate through multiple pages/links – No operation should require more than 2 to 3 clicks.
- Familiarity – The system’s interfaces and navigations should be based on other systems that the users are familiar with.
- Administration – The system should not require any administration tasks at the user level. Interfaces should be available for administration/setup operations.
- Help - The system should come equipped with Computer based tutorial in English and other languages for users to “self-learn” and “self-solve” any navigability or operational doubts.
- Standards Adherence – The system should adhere to commonly accepted standards of web-design (such as acceptable size of web pages, small style sheets etc)

## 13.6 Portability

Portability is the usability of the same software in different environments. The software will be hosted / installed in the environment as decided by DAC later on.

## 13.7 Extensibility

Extensibility refers the ability to add new functionality without requiring major changes to the existing code. Central Agricultural Portal should be extensible in the sense that new features can be easily added or plugged-in without any significant changes to the existing system. Central Agricultural Portal should be extensible to adopt following changes with minimal or no changes to existing code -

- Providing new content processing, knowledge management system
- Providing new categories of information
- Deleting existing categories of information
- Providing new workflows
- Significant growth of the content
- Providing new transactional central/state services
- Deleting existing transactional central/state services
- Providing new functionality or feature or service

### 13.7.1 Guidelines for realizing Extensibility

Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve extensibility—

- a. Solution MUST be developed using Layered architecture
- b. Solution MUST follow Object oriented methodology, which inherits extensibility
- c. User defined attributes
- d. Business rules
- e. Configurable parameters

## 13.8 Maintainability

Software maintenance is the modification of a software product after delivery to correct faults, to improve performance or other attributes.

As per ISO/IEC 14764 Maintenance activities can be categorized as:

- **Corrective maintenance:** Reactive modification of a software product performed after delivery to correct discovered problems.
- **Adaptive maintenance:** Modification of a software product performed after delivery to keep a software product usable in a changed or changing environment.
- **Perfective maintenance:** Modification of a software product after delivery to improve performance or maintainability.
- **Preventive maintenance:** Modification of a software product after delivery to detect and correct latent faults in the software product before these become effective faults.

Maintainability is defined as the ease with which a software system or component can be modified to correct faults, improve performance or other attributes, or adapt to a changed environment.

Central Agricultural Portal should have high maintainability.

Applications on Central Agricultural Portal will be maintained uniformly. But some applications may need customizations as per the requirement of States. Hence all the applications have been categorized in two types depending upon the change of design permissible -

**Core Applications** designed and developed for States will not be permitted to be modified / changed by them.

**Configurable Application** designed and developed for States will be configurable according to their needs.

The core applications will not have any configurable or customizable components at State. Applications running on Central Agriculture Portal will be core applications. The configurable applications would have parameters which can be configured as per the States' requirements. Applications common between Centre and State and only for State are configurable to allow for state level variations. All updates and patches for Core and Configurable applications are to be deployed from the Centre to all State Agricultural Portals. This approach will ensure there is only one version of application across all the portals.

### **13.8.1 Guidelines for realizing Maintainability**

In order to ensure maintainability of the applications, the following should be insured -

- Modular Software Code: Software Code must be modular and well documented.
- Avoid Complex Coding: Very complex “spaghetti code” is quite difficult to maintain safely. Hence it should be avoided.
- Early planning: anticipating what and how programs might be modified at a later stage.
- Modular design: defining subsets and simplifying functionality (i.e., one module performs only one function).
- Object-oriented design: encapsulating both methods and data structures to achieve a higher level of independence.
- Uniform conventions: facilitating error detection and debugging.
- Naming conventions: providing understandable codes.
- Use of Coding standards, comments, and style enhancing readability of the program.
- Use of Documentation standards
- Use Common tool sets
- Configuration Management
- Proper versioning of the software to be maintained.
- All the artifacts related to the software such as code, SRS, User Manual etc. should be well documented and self-explanatory for any programmer to understand. Detailed documentation shall be available at each stage for easy comprehensions of the application system.
- All documents shall be prepared as per the defined documentation standards.
- Backup and recovery policy should be in place for databases. The system administrator shall take regular back up of the database.

## 13.9 Accessibility

Accessibility is a general term used to describe the degree to which a product, device, service, or environment is available to as many people as possible. Accessibility is often used to focus on people with disabilities or special needs and their right of access to entities, often through use of assistive technology.

Website accessibility is important design consideration. Website should be accessible to all, irrespective to the physical capability of the user, his geographical location, level of literacy, technical expertise, limitations of the devices he is using for accessing website, speed of connectivity, language he knows etc.

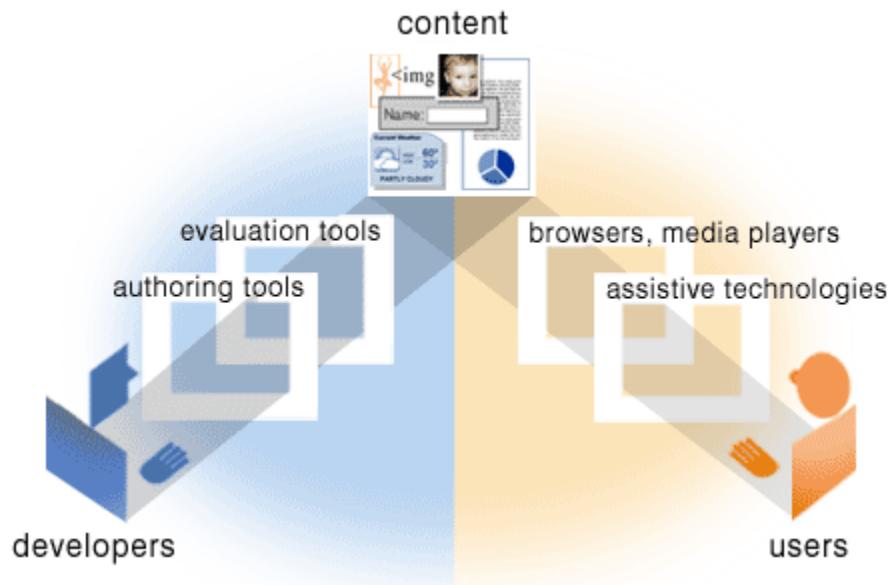
Central Agricultural Portal should have wide reach. Since the major stakeholder of the Central Agricultural Portal is farmer having limitations of literacy level, devices and connectivity speed, the accessibility with respect to these aspects is also an important design consideration along with the accessibility to persons with disabilities. For making Central Agricultural Portal accessible, it should be made Web Accessibility Guidelines compliant. Web accessibility guidelines are published by the W3C's Web Accessibility Initiative.

### 13.9.1 Essential components of web accessibility

It is essential that several different components of Web development and interaction work together in order for the Web to be accessible to people with disabilities. These components include:

- **Content** - the information in a Web page or Web application, including:
  - Natural information such as text, images, and sounds
  - Code or markup that defines structure, presentation, etc.
- **Web browsers, media players** and other "user agents"
- **Assistive technology**, in some cases - screen readers, alternative keyboards, switches, scanning software, etc.
- **Users'** knowledge, experiences, and in some cases, adaptive strategies using the Web
- **Developers** - designers, coders, authors, etc., including developers with disabilities and users who contribute content
- **Authoring tools** - software that creates Web sites
- **Evaluation tools** - Web accessibility evaluation tools, HTML validators, CSS validators, etc.

### 13.9.1.1 How the Components Relate



Source: <http://www.w3.org>

**Figure - 96: Components of web development**

Web **developers** usually use **authoring tools** and evaluation tools to create Web **content**.

People ("users") use Web **browsers, media players, assistive technologies**, or other "user agents" to get and interact with the **content**.

### 13.9.1.2 Guidelines for different components

#### 13.9.1.2.1 Authoring Tool Accessibility Guidelines (ATAG)

- contains 28 checkpoints that provide guidance on:
  - producing accessible output that meets standards and guidelines
  - promoting the content author for accessibility-related information
  - providing ways of checking and correcting inaccessible content
  - integrating accessibility in the overall look and feel
  - making the authoring tool itself accessible to people with disabilities

#### 13.9.1.2.2 Web Content Accessibility Guidelines (WCAG)

- WCAG 1.0: 14 guidelines that are general principles of accessible design
- WCAG 2.0: 12 principal guidelines

### 13.9.1.2.3 User Agent Accessibility Guidelines (UAAG)

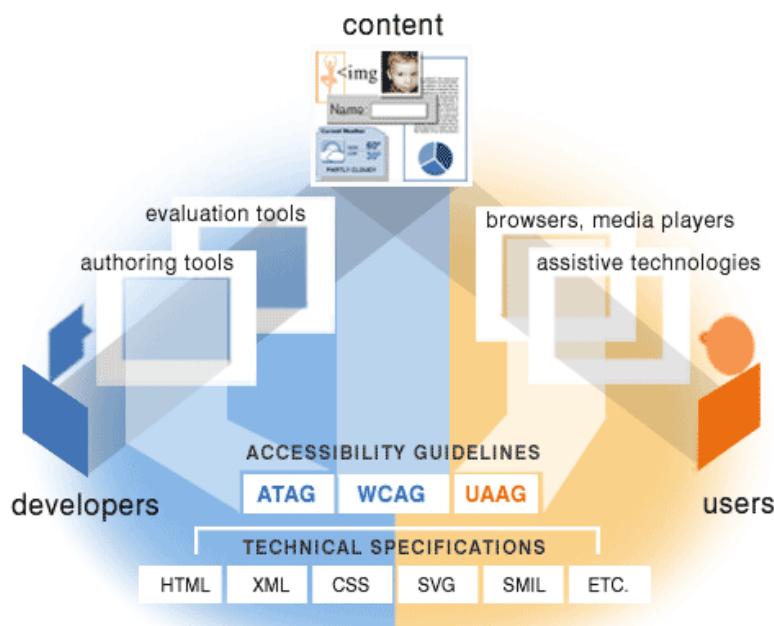
contains a comprehensive set of checkpoints that cover:

- access to all content
- user control over how content is rendered
- user control over the user interface
- standard programming interfaces

**Web Content Accessibility Guidelines (WCAG)** are part Web accessibility guidelines. These consist of a set of guidelines for making content accessible, primarily for disabled users, but also for all user agents, including highly limited devices, such as mobile phones. The current version is 2.0.

As per Web Content Accessibility Guidelines (WCAG) 2.0, the four principles of accessibility are as follows:

1. Content must be perceivable
2. User interface components in the content must be operable
3. Content and controls must be understandable
4. Content must be robust enough to work with current and future technologies



Source: <http://www.w3.org>

**Figure - 97: Components of Web Development, Accessibility, Tools and technologies**

The broad level Guidelines have been listed below -

Guideline 1.1: Provide text alternatives for all non-text content.

Guideline 1.2: Provide synchronized alternatives for multimedia.

Guideline 1.3: Ensure that information, functionality, and structure can be separated from presentation.

Guideline 1.4: Make it easy to distinguish foreground information from background images or sounds.

Guideline 2.1: Make all functionality operable via a keyboard interface.

Guideline 2.2: Allow users to control time limits on their reading or interaction.

Guideline 2.3: Allow users to avoid content that could cause seizures due to photosensitivity.

Guideline 2.4: Provide mechanisms to help users find content, orient themselves within it, and navigate through it.

Guideline 3.1: Make text content readable and understandable.

Guideline 3.2: Make the placement and functionality of content predictable.

Guideline 4.1: Use technologies according to specification.

Guideline 4.2: Ensure that user interfaces are accessible or provide an accessible alternative(s)

The detail guidelines have been included as Annexure – E in this document.

## 13.10 Multi-lingual Support

At Central Agriculture Portal, repository content management system is to be created in local languages for disseminating information to farmers.

- The system will support the entry and display of Non-Latin scripts such as Hindi, Tamil and other Indian vernacular languages
- The application will store data using Unicode representation.
- Nowadays there are many plug-in based applications available in market, through which the phrase written in one language can be translated in different languages. By using these plug-ins, a portal that supports vernacular languages can be developed.
- The database can be developed in a base language for e.g. in English. This plug-in is then placed between the database and the application. The language of the data is first selected

in the application and then data is entered through the form available in the application. This information of the language and the data reaches the plug-in first. The plug-in understands the language and then translates the data in to base (English) language and then stores the data in the database. Similarly, when the information is retrieved from the database, it reaches the plug-in first, meanwhile; the plug-in also has the information of the language in which the data in base (English) language needs to be translated into, from the form available in the application. The plug-in then translates this data in the language of the user's choice and displays the same on the form available in the application.

- Examples of the above mentioned plug-ins are as below:
  - An Application related to Land Use and Acquisition has been developed by NIC which makes use of the plug-in developed by C-DAC, Pune.
  - Details of another such Plug-in software developed by C-DAC, Pune is available at the mentioned link:  
<http://pune.cdac.in/html/aai/mantra.aspxA>
  - Software by the name of “MANTRA – Rajbhasha” has been developed by C-DAC, Pune. The details of the same are available at the below mentioned link:  
[http://pune.cdac.in/html/aai/mantra\\_rajbhasha\\_en.aspx](http://pune.cdac.in/html/aai/mantra_rajbhasha_en.aspx)

### 13.10.1 Guidelines for realizing Multi Lingual User Interface

Following are few guiding principles but not limited to that Central Agricultural Portal should adhere in order to achieve multi lingual user interfaces –

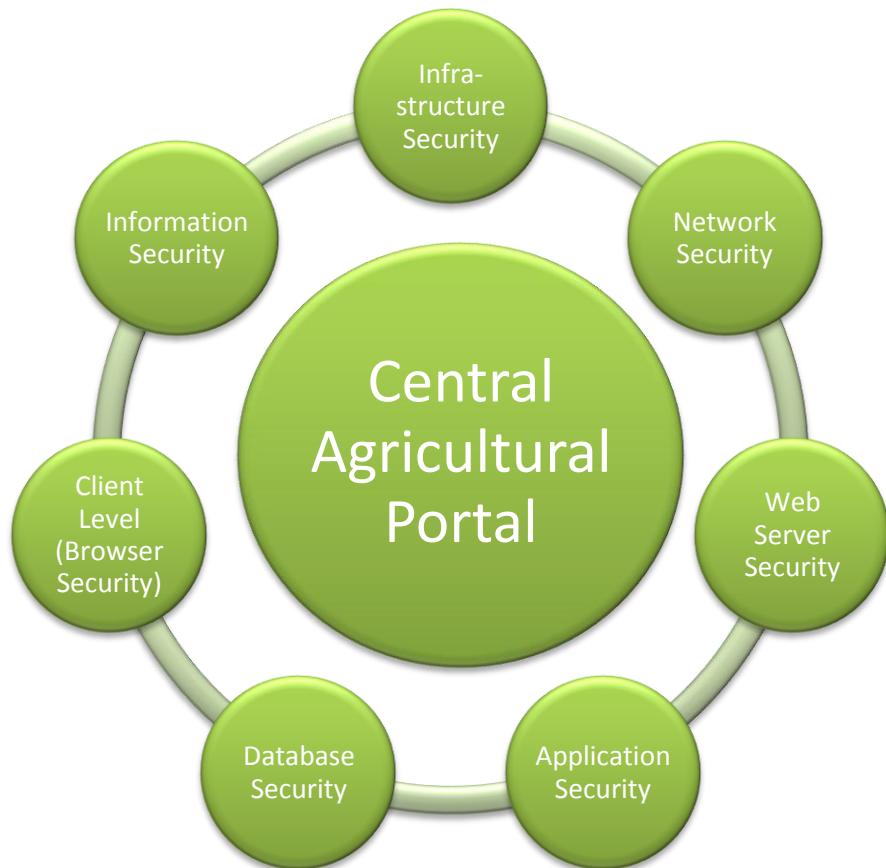
- a. Unicode should be used for character encoding
- b. Data server and content management system should support Unicode
- c. All user interface elements such as strings, constants, UI labels, images, error messages etc. should be externalized and application should use language dependent mapping using a platform defined standard.
- d. Launch the application in the default user interface language, and offer the option to change to other languages
- e. Position language option on home page such that it is easily noticeable
- f. Provide language option in respective language
- g. Maintain consistency between pages of multiple languages

## 13.11 Security

The services of NeGP-Agriculture which will be accessible from Central Agricultural Portal have been categorized as information services, transaction services and workflow services.

Most of the information for information services will be in public domain. A proper access regime is required to ensure that various stakeholders at Centre / State could log on to CAP and perform appropriate activities in order to deliver updated and relevant information to farmers.

Security requirements of the transaction based services and workflow based services are high. The portal will include identities of Government officers and other stakeholders, online payment, inter departmental transactions, workflows which are critical with respect to security. Adequate safety measures would be incorporated during development stage itself to prevent vulnerabilities and build secured code for these services on Central Agricultural Portal. The system should have protection against unauthorized creation / modification of data and unauthorized viewing of data. System should demonstrate awareness of the codes of practice provided by ISO/IEC 17799:2000.



**Figure - 98: Central Agricultural Portal - Security**

The following security considerations are to be made:-

### **13.11.1 Software level Security**

#### **13.11.1.1 System Software Level Security**

The advice in operating system manuals concerning security must be followed. All known security patches must be applied to all system software products.

#### **13.11.1.2 Application Software Level Security**

The access to various applications will be controlled by active directory authentication services for government users. Since SOA paradigm is used, the web service itself must be secured. The access to various applications by external users will be controlled by maintaining their identities in database along with proper assignment of roles and access privileges. In short following are the suggested application level security requirements –

- a. Implement security as per the defined security policy
- b. Public content should be accessible to all users where as secured content should be accessible to only authenticated users
- c. Single sign-on should be provided for accessing all services and information
- d. Open Web Application Security Project (OWASP) standard for Security to be followed

### **13.11.2 Database level security**

Following are the suggested database level security requirements-

- a. Only authorized users are allowed to upload / change the data
- b. The data backup is performed as part of schedule task and is encrypted to ensure safeguard against data theft
- c. Sensitive data should be stored in a secured manner

#### **13.11.2.1 Data Security**

The data is a very valuable resource, and establishing a secure data environment is a key component of the NeGP-AMMP's Technical Architecture, particularly since more and more applications use the Internet to access data. It is critical that the data be protected against any unauthorized access. Data security should be designed to protect data against the following threats:

- a) Unauthorized use of the database or application
- b) Accidental modifications and deletions
- c) Confidentiality and integrity breeches for data in data transport and physical storage
- d) Disasters

Following guidelines should be followed for securing the data –

- **Use generic, protected user accounts for direct database access to streamline administration, ensure scalability, and protect against non-application data access**
  - i. Access to the database should be provided only through application and no direct access of database to users should be allowed
  - ii. The user accounts must be defined only at one directory repository with standard protocol to access it
- **Manage sensitive data**
  - i. Sensitive data must be secured on a database server with proper policies and procedures in place
  - ii. Ensure that passwords are encrypted both inside application executables and across the transport layer
  - iii. A backup and recovery plan for databases must be in place
- **Record information about users and updates made by them on data for audit trail purposes**
  - i. The information that can be captured by the application includes-
    - The account the user logged in with
    - Logged in and logged out time and duration
    - The TCP/IP address of the connected user's workstation
    - The certificate information, in case certificate is being used by the user
    - The old values before the modification
    - The updated values
- **Implement transaction logging so recovery of original data is possible and protect the transaction log**
  - i. Transaction logging records activity on the database and can be used to roll back a transaction.
  - ii. Protect the transaction log through access control and backup. Only the database should be writing to the transaction log. All other access should be read only.
  - iii. The transaction log should be located on a separate physical disk if possible. If it is not possible, use RAID to protect the integrity of the log file.
- **Implement security scanning and intrusion detection**
  - i. Scan the database and database server for potential weaknesses

- ii. Monitor the database for possible intrusions. For example, monitor and alert when multiple invalid login attempts occur. Intrusion detection protects the database server from attacks from both sides of the firewall (e.g., internal network, WAN, or Internet)
  - iii. Audit logins, user account creation, and failed login attempts
- **Ensure data integrity by securing data movement or data transport**
    - i. When high impact, sensitive data is transported through the LAN, WAN, or Internet, ensure that the data is encrypted and protected from alterations. This can be accomplished through Secured Socket Layers (SSL) or Virtual Private Network (VPN).
    - ii. Other types of data must be encrypted and protected if there is a risk of the data being altered.
  - **Protect source code in data access rules, particularly if it contains password information**
    - i. If an application needs to store account and password information in order to access a database or other application service, protect the source code from unauthorized viewing.
    - ii. Store passwords in an encrypted format when possible.
  - **Protect and encrypt data for sensitive applications**

When it is absolutely necessary to store sensitive data, it should be stored in encrypted form.
  - **Change all default database Passwords**

Hackers often attempt a login to a system administrator account using a default password. As soon as a database is set up, change all default passwords.
- 
- **Infrastructure level security**

Following are the suggested infrastructure level security requirements-

    - a. The machines used to deliver projects must be operated in as secure a manner as possible.
    - b. Preventive solution for detecting and preventing threats such as viruses, intruders etc should be implemented
    - c. Security audits should be performed as per the defined security policy
    - d. Data center of the Central Agricultural Portal should have adequate physical security so as to allow entry only to authorized persons
    - e. Must establish, maintain and effectively implement plans for emergency response, backup operations and post-disaster recovery to ensure the availability of critical information resources and continuity of operations in emergency situations

- f. Establish an incident handling capability that includes adequate preparation, detection, analysis, containment, recovery and user response activities and track, document and report incidents to appropriate officials and/or authorities.

### 13.11.3 Network security

Network security for Central Agricultural Portal should be attained by implementation of SSL and TLS protocols.

Machines should be configured to run only the minimum number of network services. Machines should be placed behind a firewall, with access to the Internet only on those ports that are required for the project being delivered.

Check on Network traffic will be placed by implementation of firewall and only authorized traffic will be allowed to pass to and from the server hosting Central Agricultural Portal

- **In addition, system should provide the following security features,**
  - Transactional Central/State services are accessible only to authenticated users
  - Where sensitive information is being passed from a client to a server across the network, it should be passed over https. Secure Sockets Layer (SSL) is to be used to encrypt the data. This includes the transfer of usernames and passwords, credit card details and other personal information. The use of SSL also provides the end-user with an increased level of confidence in the authenticity of the service.
  - Confidential information such as login pages and pages related to transactional services should be served over https

Security auditing will be undertaken by third party appointed by DAC before launching of the portal. All the security flaws reported during security audit will be fixed by the development team. The software should also adhere to security guidelines, standards and policies prescribed by NIC's Security Division and should be audited and certified for compliance to these standards by Security Division before it is hosted in Production Environment.

As the portal will be constantly enriched for new features and applications during maintenance phase, it should be referred to security auditing, whenever there are further additions/modifications in the source code. For identifying security breaches proper audit trail is to be maintained.

### 13.11.4 Security Layer

Central Agricultural Portal being web based system should be secure. It should be secure in terms of authorization and authentication. The security layer will provide various security services to Central Agricultural Portal across multiple layers. The security layer should be

implemented using Identity and Access management tools to manage user identities, roles, security policies, organizations/businesses, authentication, authorization, access control and other additional services like data encryption and SSL. The Central Agricultural Portal Security Services are primarily authentication, authorization, Portal Access Control, Services Access Control, Secured Pages, Single-Sign on, security event logging and Audit trailing.

#### **13.11.4.1 Authentication**

Agriculture MMP solution's authentication component will authenticate by challenging users to provide their user id and password.

Following guidelines should be followed for authenticating users -

- a. Authenticate users prior to accessing services
  - i. Allowing only authenticated users to access system resources protects resources from inappropriate access.
  - ii. Authenticating users are the basis for providing accountability.
- b. Use Public Key / Private Key technology for authentication when digital signatures are required.
  - i. Public Key / Private Key technology is the most widely accepted form of digital signatures.
  - ii. Digital signatures are central for most electronic business.
- c. Use token-based or strong password based authentication where public key certificates are not feasible.
  - i. Token-based systems are an improvement over passwords.
  - ii. Where token-based identification and authentication is not possible, a password policy based on best practices can provide an acceptable level of security.
- d. CAPTCHA technique should be used for protecting automated form submission during important user input forms.

#### **13.11.4.2 Authorization**

Authorization component will make sure that stake holders must be able to access only the information for which they have privileges to access. An authorized system user should be allowed to define the various available roles in the system. Each user will be mapped to the respective role. Based on this the user will be provided access to various available functionalities of Agriculture MMP solution.

#### **13.11.4.3 Portal Access Control**

Central Agricultural Portal ACL (Access Control List) should contain list of authorizations given to the user such as read, write, and delete, etc for a particular object. An ACL lists the type of access to a particular object, each user or a group of users is allowed or denied. In order to make

ACLs shorter and more manageable, users with the same access rights are often put into security groups.

#### **13.11.4.4 Service Access Control**

Securing Services is one of the key challenges in services based environment. The immediate security level that can be provided on Services is securing the transport protocol used to transmit the SOAP requests and responses. Service should be made available through HTTP. SSL will be a good way to fulfill security requirements. SSL provides integrity and confidentiality for the communication between the service provider and service consumer.

#### **13.11.4.5 Secured Pages**

Central Agricultural Portal will have public and protected pages based on the secure information of the functionality. This secure information should be transferred using secured protocol like HTTPS. Pages like User Login, Transactional pages where credit card information etc will be considered as secured pages.

#### **13.11.4.6 Secure Proxy Server**

The secure proxy server will intercept stakeholders whenever they request the access to the secured information. URL will be routed to this component, whereas it will challenge (User Id and Password) the user for authentication if user accesses the secured information.

#### **13.11.4.7 Single Sign-on**

Within the Central Agricultural Portal, the stakeholder interacts with the portal and in turn accesses multiple information, back-end applications, portals etc. SSO facilitates seamless user navigation across multiple applications/portals and avoids multiple logins. In case of unsupported applications customized mechanisms will be used to achieve the single sign-on.

#### **13.11.4.8 Activity Logging**

The Central Agricultural Portal should be able to log and react to (such as storing the event for reporting later, or generating an alert) events generated from various source components and take specific actions based on the business requirement.

#### **13.11.4.9 Audit Trail**

The Central Agricultural Portal should have a mechanism that captures all changes (add, update, delete) to data. These include changes to data that may have occurred outside the application functionality.

## 13.12 Access Points and Access Devices

Following are the suggested access points and access devices related requirements

- a. Portal should be accessible on all popular browsers such as Internet Explorer, Firefox, Google Chrome, etc
- b. Primarily access devices would be desktop and laptop computers. However portal should be accessible on other devices such as mobile telephones, PDA, etc.

### 13.12.1 Delivery Channels

The delivery channels form an important component for success of the Agriculture MMP implementation. Central Agricultural Portal should be available / interact with these delivery channels for delivery of information. Without adequate support from the front end service delivery channels, the backend process changes automation efforts would be wasted. To therefore ensure that the service delivery of the proposed services happens as intended, a number of service delivery channels need to be used that directly or indirectly interface with the end beneficiaries.

Currently in the Indian agriculture sector, the major information and service delivery channels for the farmer have been physical interactions with government offices up to the district level, information exchange with fellow farmers and self learning. The change requirements for this area require integration with existing service delivery channels and service delivery to happen through a number of modes which offer transparency, efficiency and clarity to the information seeker.

Major issues which the proposed solution needs to take account are loss, reach and latency of information in service delivery. The requirement is to provide integrated information dissemination systems which are able to overcome all three issues with their features and benefits.

In the proposed solution, a number of service delivery channels have been positioned, these are –

1. Physical Channels – Government Offices, Fellow Farmers, Agriculture Clinics and Business Centres, Krishi Vigyan Kendra, State Agriculture Universities, Extension Workers, Mass Media (incl. TV, Radio, Newspapers ), Print Media (Pamphlets, Gazettes, Notifications etc.) etc.
2. Online Channel – Portal (Central Agriculture Portal and State Agriculture Portal), Common Service Centres, Kisan Call Centres, State Call Centres etc.

Interfaces of the Central Agricultural Portal should be built such that information and services are accessible to these delivery channels easily.

## 14 Standard Architectural Components

Following is the list of minimum suggested architectural components for realizing the National Agricultural Portal

Client layer	<ul style="list-style-type: none"> <li>• Access devices: Desktop, Laptop, Mobile, PDA</li> <li>• Browser</li> </ul>
Security layer	<ul style="list-style-type: none"> <li>• Secure Proxy Server</li> <li>• Authentication</li> <li>• Single Sign-On</li> <li>• Authorization</li> </ul>
Presentation layer	<ul style="list-style-type: none"> <li>• Page layouts</li> <li>• UI templates</li> <li>• Style sheets</li> <li>• Client side validation libraries</li> </ul>
Business Logic layer	<ul style="list-style-type: none"> <li>• Transactional Services</li> <li>• Metadata Synchronization</li> <li>• User Management</li> <li>• Personalization</li> <li>• Self-Service</li> <li>• Content Authoring</li> <li>• Content Workflow</li> <li>• Content Delivery</li> <li>• Portal Usage Reports</li> <li>• Search</li> <li>• Application Logging</li> <li>• Exception Handling</li> </ul>
Management & Monitoring layer	<ul style="list-style-type: none"> <li>• Application Management</li> <li>• Infrastructure Management</li> <li>• Backup and Restore</li> <li>• System Administration tools</li> </ul>
Data layer	<ul style="list-style-type: none"> <li>• Database Server</li> <li>• Directory Server</li> <li>• Documents Repository</li> <li>• Portal Usage Database</li> <li>• Content Repository</li> </ul>
Operations layer	<ul style="list-style-type: none"> <li>• Service Registry</li> <li>• Service Repository</li> <li>• Content feed providers</li> </ul>

## 15 Logical Database Requirements

Database will have two categorizations of the tables. These are

- Master Tables
- Transaction Tables

Master tables will be common across all applications. The logical database requirements have been given in details in Annexure - C

## 16 Digitization Requirements

A large amount of the information components is already available in the government framework offline. This data needs to be converted digitally and / or needs to be managed so that a useful search and indexing can be done on it. It would be required that the Central Departments and State Department of Agriculture and other associated agencies involved in content generation and processing put efforts in digitizing this data for useful search and indexing

Another key requirement from the Agriculture MMP perspective is the activity of data digitization and localization into regional / vernacular languages for the ease of the farmer / state officials to understand it. As per DPR prepared for NeGP-Agriculture Mission Mode Project, following information needs digitization -

- PoPs and GAPs for more than 300 crops
- Quality control & assurance
- Acts like Seeds Act, Insecticides Act and Fertilizer Control Order to be digitized in 5 languages
- Crop diseases for more than 300 crops in 5 regional languages (Assamese, Hindi, Kannada, Marathi, and Malayalam)

Apart from this, following content will also need digitisation

- Application forms
- Procedures (Export, Import etc.) and Guidelines
- Knowledge Management
- Success stories
- Manuals, Videos and Audios for farm mechanization and extension programs

- ...

To maximize access on the Central Agricultural Portal, it is desirable that open standard file formats should be used for digitization. The use of open file formats will help with interoperability, ensuring that resources are reusable and can be created and modified by a variety of applications. However, in some cases there may be no relevant open standards or the relevant standards may be sufficiently new that conformant tools are not widely available. In some cases therefore, the use of proprietary formats may be acceptable.

Following two sections give requirements and guidelines for digitisation and delivery of content on web.

## **16.1 File Formats for digitisation**

### **16.1.1 Text Capture and Storage Requirements**

#### **16.1.1.1 Character Encoding**

A character encoding is an algorithm for presenting characters in digital form by mapping sequences of code numbers of characters (the integer corresponding to characters) into sequences of 8-bit values (bytes or octets). An application requires an indication about the character encoding used in a document in order to interpret the bytes which make up that digital object.

The character encoding used by text-based documents should be explicitly stated. For XML documents, the character encoding should usually be recorded in the encoding declaration of the XML declaration. Unicode standards are to be used.

#### **16.1.1.2 Document Formats**

Text based content should be created and managed in a structured format that is suitable for generating HTML or XHTML documents for delivery.

In some instances, ODF (Open Document Format) or Adobe Portable Document Format (PDF) may be used to store text-based content. For a long time PDF has been a proprietary file format, owned by Adobe, that preserves the fonts, formatting, colours and graphics of the source document. PDF files are compact and can be viewed and printed with the freely available Adobe Acrobat Reader. However, the PDF format has been standardised and PDF/A is now an ISO Standard for using PDF format for the long-term archiving of electronic documents.

### **16.1.1.3 Still Image Capture and Storage**

Digital still images fall into two main categories: raster (or ‘bit-mapped’) images and vector (‘object-oriented’) images. Raster images take the form of a grid or matrix, with each ‘picture element’ (pixel) in the matrix having a unique location and an independent colour value that can be edited separately. Vector files provide a set of mathematical instructions that are used by a drawing program to construct an image. The digitisation process will usually generate a raster image. Vector images are usually created as outputs of drawing software.

#### **16.1.1.3.1 Raster Images**

When creating and storing raster images, two factors need to be considered these are the file format and the quality parameters. Raster images should usually be stored in the uncompressed form generated by the digitisation process without the application of any subsequent processing. Raster images must be created using one of the following formats: Tagged Image File Format (TIFF), Portable Network Graphics (PNG), Graphical Interchange Format (GIF) or JPEG Still Picture Interchange File Format (JPEG/SPIFF). There are two primary parameters to be considered: (i) Spatial resolution and (ii) Colour resolution. In general, photographic images should be created as TIFF images.

Images should be created at the highest suitable resolution and bit depth that is both affordable and practical given the intended uses of the images.

Computer-generated images such as logos, icons and line drawings should normally be created as PNG or GIF images at a resolution of 72 dpi.

#### **16.1.1.3.2 Vector images**

Vector images consist of multiple geometric objects (lines, ellipses, polygons, and other shapes) constructed through a sequence of commands or mathematical statements to plot lines and shapes. Vector graphics should be created and stored using an open format such as Scalable Vector Graphics (SVG), an XML language for describing such graphics. SVG drawings can be interactive and dynamic, and are scalable to different screen display and printer resolutions.

### **16.1.1.4 Video Capture and Storage**

Video should usually be stored in the uncompressed form obtained from the recording device without the application of any subsequent processing. Video should be created at the highest suitable resolution, colour depth and frame rate that are both affordable and practical given its intended uses, and the minimum level of quality. Video may be created and stored using the appropriate MPEG format.

### **16.1.1.5      Audio Capture and Storage**

Audio should usually be stored in the uncompressed form obtained from the recording device without the application of any subsequent processing such as noise reduction. Audio may be created and stored using compressed formats such as MP3.

### **16.1.1.6      Multimedia**

Multimedia formats can be used to provide integration of text, image, sound and video resources. The open standard W3C SMIL format may be used for delivering multimedia over the Web.

### **16.1.1.7      GIS**

GIS (Geographic Information Systems) can be used to integrate, store, edit, manage and present data which are spatially referenced (linked to location). The data that may be integrated in a GIS include raster images (e.g. digitised historic maps), vector images (e.g. maps captured using drawing software or data captured in the field using electronic measuring instruments), text and numeric data (e.g. databases describing the attributes of a location).

## **16.2 Delivery Formats**

Digitised content is to be made available on Centralised Agricultural Portal to be delivered on internet. It is expected that end-user access to resources will be primarily through the use of Internet protocols. Preparation of content for delivery requires the processing of the digitised content to generate digital objects suitable for use in the Internet context, typically by reducing quality in order to generate files of sizes suitable for transfer over networks.

Video and audio may be made available either for download or for streaming. With streaming, instead of the entire file being transferred before playback can start, a small buffer space is created on the user's computer and data is transmitted into the buffer. As soon as the buffer is full, the streaming file starts to play while more data is transmitted. Consideration must be given to the fact that variations exist in –

- The types of hardware device and client software employed by users
- The levels of bandwidth restriction within which users operate

To maximise potential audience reach, Central Agricultural Portal should make resources available in alternative sizes or formats or at alternative resolutions/bitrates to the extent possible.

## **16.2.1 Identification**

Digitised resources should be unambiguously identified and uniquely addressable directly from a user's Web browser.

## **16.2.2 Delivery of Text**

### **16.2.2.1 Character Encoding**

The character encoding used in text-based documents should be transmitted in the HTTP header and also recorded within documents as appropriate. Some XML-based protocols may mandate the use of a specified character encoding, e.g. the OAI Protocol for Metadata Harvesting requires the use of the UTF-8 character encoding.

### **16.2.2.2 Document Formats**

Text-based content must be delivered as XHTML 1.0 or HTML 4 (or subsequent versions), through the use SGML or XML formats conforming to other Document Type Definition (DTDs) or Schemas may sometimes be appropriate. In some cases, delivery in PDF or in proprietary formats such as ODF, RTF or Microsoft Word may be appropriate as a supplementary format to XHTML/HTML, but accessibility issues must be addressed.

### **16.2.2.3 Delivery of Still Images**

#### **16.2.2.3.1 Photographic images**

Photographic images must be provided on the web as JPEG/SPIFF format. Consideration should be given to providing various sizes of image to offer readability appropriate to the context of use. Thumbnail images should be provided at a resolution of 72 dpi, using a bit depth of 24-bit colour or 8-bit greyscale, and using a maximum of 100-200 pixels for the longest dimension (Source: EMII-DCF).

Images for full-screen presentation should be provided at a resolution of 150 dpi, using a bit depth of 24-bit colour or 8-bit greyscale and using a maximum of 600 pixels for the longest dimension.

#### **16.2.2.3.2 Graphic non-vector images**

Images should be delivered on the Web using Graphical Interchange Format (GIF) or Portable Network Graphics (PNG) format.

#### **16.2.2.3.3 Graphic vector images**

Images should be delivered on the Web using the Scalable Vector Graphics (SVG) formats.

#### **16.2.2.4 Delivery of Video**

Consideration should be given to the possibility that users' access to video may be constrained by bandwidth restrictions and it may be appropriate to provide a range of files or streams of different quality.

##### **16.2.2.4.1 Downloading**

Video for download may be delivered on the Web using the MPEG-1 standard or by using the Microsoft Audio Video Interleave (AVI), Windows Media Video (WMV) or Apple QuickTime proprietary formats.

##### **16.2.2.4.2 Streaming**

Video for streaming may be delivered on the Web using Microsoft Advanced Systems Format (ASF), Windows Media Video (WMV) or Apple QuickTime formats, etc.

#### **16.2.2.5 Delivery of Audio**

Consideration should be given to the possibility that users' access to audio may be constrained by bandwidth restrictions and it may be appropriate to provide a range of files or streams of different quality.

##### **16.2.2.5.1 Downloading**

Audio should be delivered on the web in a compressed form, using the MPEG Layer 3 (MP3) format or the proprietary RealAudio (RA) or Microsoft Windows Media Audio (WMA) formats. Audio may be delivered in uncompressed forms using the Microsoft WAV, Mac AIFF or Sun AU formats.

##### **16.2.2.5.2 Streaming**

Audio for streaming should be delivered on the web using the MPEG Layer 3 (MP3) standard or the RealAudio (RA) or Microsoft Windows Media Audio (WMA) proprietary formats.

## 17 Other Requirements

### 17.1 Visibility of the Central Agricultural Portal

Visibility and ranking of the Central Agricultural Portal in search results can be improved by –

- a. Following best practices in the web site design by separating style from content, minimizing JavaScript and streamlining code to allow search engines to crawl, index and rank web pages more easily.
- b. Using clear and simple language appropriate for the site's content. Making sure that the free text on the website includes the words that users are likely to use when searching on search engines.
- c. Providing a text equivalent for all non-text elements (such as still and moving images) in an alt or longdesc tag to allow search engines to understand and index the content.
- d. Providing text links give search engines important additional information about the content of the target page. Including redundant text links for image maps such as menus.
- e. Specifying the language of all documents, to enable correct indexing by search engines.
- f. Making sure that web-pages are usable when scripts, applets or other programmatic objects are turned off. Search engines do not read scripts.
- g. Registering Central Agricultural Portal with directories
- h. Building links. Sending RL with a brief description to the webmasters of other related organisation. Search engines take into consideration how many other Web sites link to your site when determining its ranking in search results.

### 17.2 Web Services Requirement

The Central Agricultural Portal will interact, cooperate, collaborate and integrate information across other external systems, existing systems in Agricultural Sector, State Agricultural portals and applications developed for Service Clusters through web services.

National Service Delivery Gateway (NSDG), State Service Delivery Gateway (SSDG) and Mobile Service Delivery Gateway will be used as repository of the web services and will act as a gateway for their access. Common web services available with NSDG, SSDG and MSDG will also be used for interactions among systems.

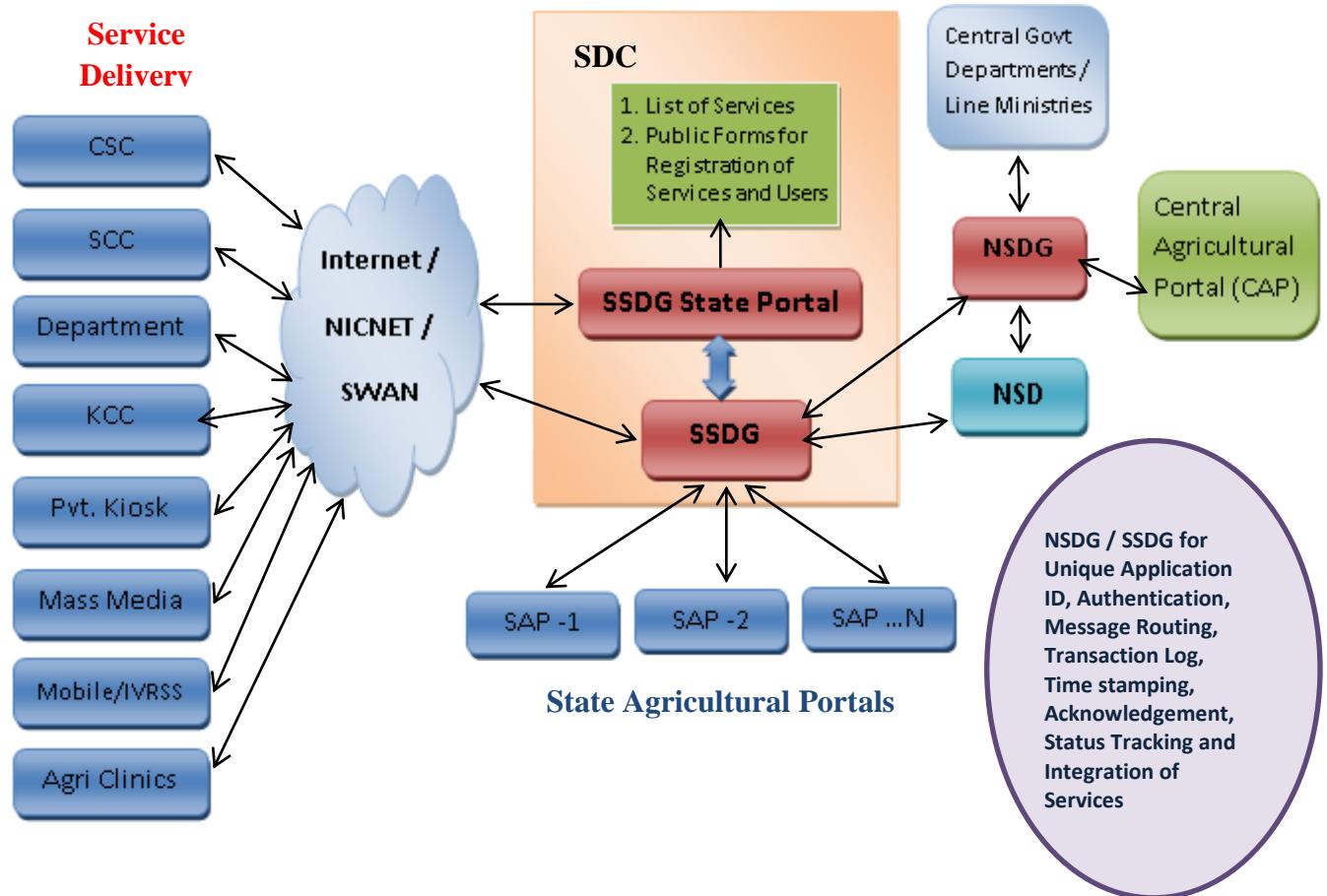
The following sections provides information about NSDG, SSDG and MSDG in brief –

### **17.2.1 National Service Delivery Gateway (NSDG) and State Service Delivery Gateway (SSDG)**

The National e-Governance Plan (NeGP) of the Government of India aims to collaborate and integrate information across different departments in the Centre, States and Local Governments. Government systems are characterized by islands of legacy systems using heterogeneous platforms and technologies and spread across diverse geographical locations, in varying state of automation, make this task very challenging. This scenario is applicable for Agricultural Sector as well. There are many e-governance applications developed in Agricultural sector to provide online services to farmers, agri- businesses, Government and other stakeholders at Central Level under various schemes as well as at State level under Central Sector Scheme AGRISNET and other State specific e-governance projects. Also under NeGP-Agriculture Mission Mode Project State specific applications will be located at State Server and Central specific applications will be located at Central Server. The CAP and SAPs will provide public interfaces of these applications. All these applications will need to exchange information and services to provide integrated services to all stakeholders, especially farmers. This necessitates developing connectors / adaptors for point to point connections between these heterogeneous applications and portals. The point-to-point contact between these heterogeneous applications and portals at various geographical locations will increase the complexity and create mesh of interactions.

The National e-Governance Service Delivery Gateway (NSDG) and The State e-Governance Service Delivery Gateway (SSDG) will help to reduce such point to point connections and provide a standardized interfacing, messaging and routing switch to make applications and data inter-operable between existing applications and new applications developed for various departments in Agricultural Sector in heterogeneous platforms and spread across geographically.

The NSDG and SSDG can act as standards-based messaging switches at Central level and State level respectively providing seamless interoperability and exchange of data across these applications. The following diagram depicts how Central Agricultural Portal, State Agricultural Portals, Services developed under NeGP-Agriculture Mission Mode project will interact with each other and other applications and external interfaces with the help of NSDG and SSDG.



**Figure - 99: Agriculture MMP – NSDG and SSDG Infrastructure Usage**

## 17.2.2 Mobile Service Delivery Gateway (MSDG)<sup>2</sup>

Department of Information Technology has undertaken the Mobile Governance (M-Governance) initiative to make public services available to the common man through mobile devices. Mobile Service Delivery Gateway (MSDG) can be utilized for delivering information services through mobile phones.

<sup>2</sup> Source: a) Report on using Mobile e-Governance Service Delivery Platform (MSDP) to deliver citizen centric services over Mobile. b) MSDP-SMS Integration Document – Departments document by C-DAC

MSDP (Mobile e-governance Services Delivery Platform) provides an integrated platform for delivery of government services to citizen over mobile devices using SMS, USSD, IVRS, LBS, or mobile applications installed on the mobile phones.

### **17.2.2.1 How to use Mobile e-governance Services Delivery Platform**

As part of MSDG, SMS Gateway has already been launched and can be readily deployed for delivery of public services. The Department of Telecommunication (DoT) has allocated the SMS short code 51969 to DeitY for M-Governance Services. Various Telecom Service Providers (TSPs) in the country have opened this service.

Under NeGP-Agriculture Mission Mode project services that can be delivered over Mobile Service Delivery Gateway will be identified, developed and these will be added to the M-Gov Application Store which hosts the various mobile applications for government services.

### **17.2.2.2 HTTP API Documentation (Push SMS)**

#### **17.2.2.2.1 Overview**

HTTP API lets departments send across SMS messages using HTTP URL interface. The API supports SMS push (Single SMS and Bulk SMS) and SMS Scheduling.

#### **17.2.2.3 Terms and Definitions**

**Sender ID:** Sender ID or CLI (Caller Line Identification) is limited to 8 characters in the API. According to TRAI regulations, there will be a 2 character prefix when delivered to the phone. For example if you are passing the Sender ID as “NEGPA”, you'll may the SMS delivered as TD-NEGPA according the route SMS Gateway chooses.

**Message Length:** For standard character set 160 characters per SMS is supported. If a message is sent, whose length is longer than permitted characters limit, it shall be broken into multiple messages. User can submit up to 480 characters in one API request.

### **17.2.3 Pull SMS Integration**

#### **17.2.3.1 Overview**

Short code **51969** has been allocated to MSDP by the Department of Telecom. This short code will be the single point of access for all the pull based SMS services.

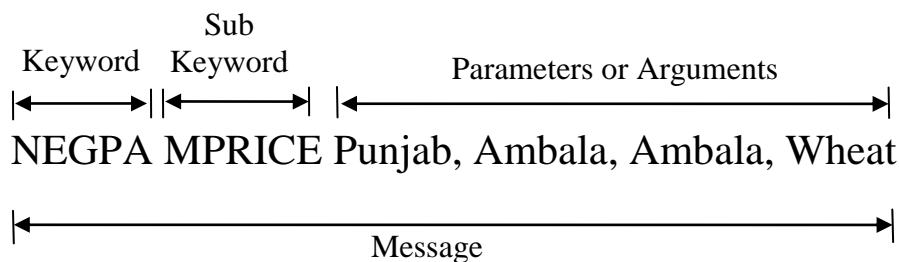
### 17.2.3.2 Components of an Incoming SMS

Incoming message will have following components -

Keyword – NeGPA for NeGP-Agriculture Mission Mode Project

Sub Keyword – Keyword for Service Name for e.g. MPrice for Market Prices. Sub keyword will be easier to remember.

Parameter or Argument – parameters separated by commas for e.g. State Name, District Name, Market Name, Commodity Name as “Punjab, Ambala, Ambala, Wheat”



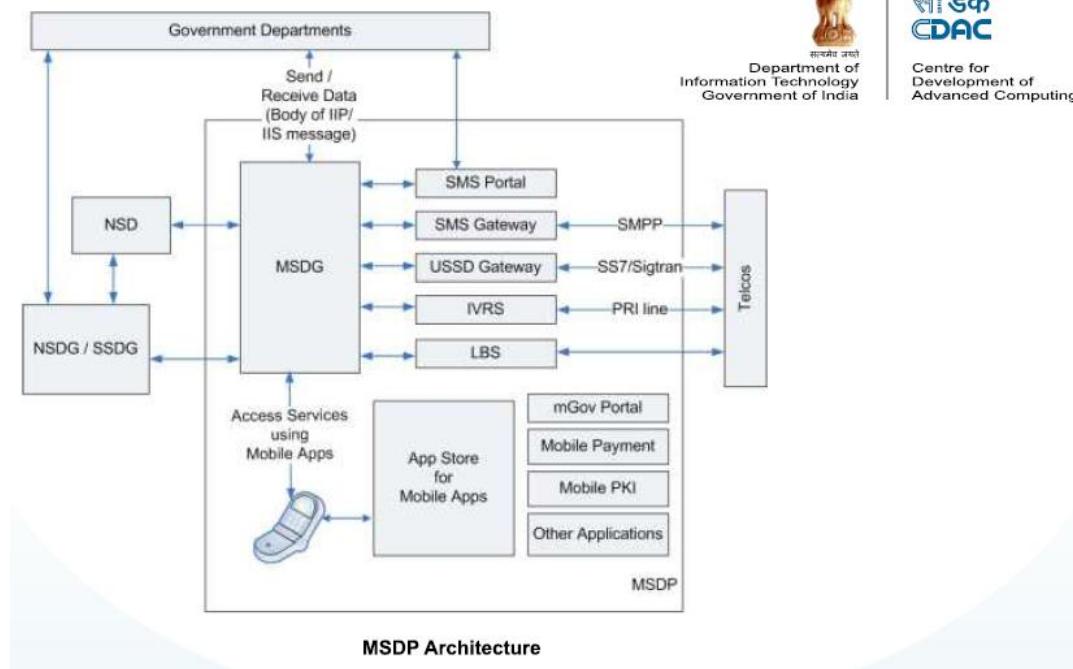
#### Example:

When the citizen will send an SMS “NEGPA MPRICE Punjab, Ambala, Ambala, Wheat” to the short-code 51969, the first word represents the keyword for the project, the second word MPrice represents for keyword for the Market Price service and the third word represent the market location and commodity name for which service is requested.

**Recommendation:** It is also recommended that every sub keyword should have has a configured HELP sub-keyword for service discovery. In case of an invalid SMS being sent, an instruction to use the HELP discovery service should be sent back.



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Source: MSDP-SMS Integration Document – Departments document by C-DAC

**Figure - 100: MSDP Architecture**

## Major Websites in Agricultural and allied Sectors

### I. Central Level

#### i. List of Websites

Sl No.	Name of the Website	Description (Year, Implemented by, Updation frequency, Hosted at, stakeholders)	URL
1.	AGMARKNET	<ul style="list-style-type: none"> <li>- 2001</li> <li>- NIC</li> <li>- Daily</li> <li>- NIC</li> <li>- Primarily the farming community</li> </ul>	<a href="http://agmarknet.nic.in">http://agmarknet.nic.in</a>
2.	Department of Agriculture and Cooperation	<ul style="list-style-type: none"> <li>- -</li> <li>- NIC</li> <li>- As and when data required</li> <li>- NIC</li> <li>- Central/ State Agriculture depts.</li> </ul>	<a href="http://agricoop.nic.in">http://agricoop.nic.in</a>  <a href="http://dacnet.nic.in/farmer/new/home-new.html">http://dacnet.nic.in/farmer/ new/home-new.html</a>
3.	Agriculture Census Website	<ul style="list-style-type: none"> <li>- 2003</li> <li>- NIC</li> <li>- As and when data for Agriculture Census gets updated</li> <li>- DACNET Server</li> <li>- Ministry of Agriculture and its User</li> </ul>	<a href="http://agcensus.nic.in">http://agcensus.nic.in</a>
4.	DACNET  Department of Agriculture and Cooperation Network	<ul style="list-style-type: none"> <li>- 2003</li> <li>- NIC</li> <li>- As and when required</li> <li>- DACNET Server</li> <li>- Ministry of Agriculture</li> </ul>	<a href="http://dacnet.nic.in">http://dacnet.nic.in</a>

5.	SEEDNET	<ul style="list-style-type: none"> <li>- 2006</li> <li>- NIC</li> <li>- As and when required</li> <li>- NIC</li> <li>- Central / State Govts., National Seed Corporation, State Seed Corporation, Seed Labs, Universities, KVKS, Farmers</li> </ul>	<a href="http://seednet.gov.in">http://seednet.gov.in</a>
6.	Farm Mechanization	<ul style="list-style-type: none"> <li>- 2009</li> <li>- NIC</li> <li>- As and when required</li> <li>- NIC</li> <li>- Central / State Agriculture Departments</li> </ul>	<a href="http://farmmach.gov.in">http://farmmach.gov.in</a>
7.	Rashtriya Krishi Vikas Yojana (RKVY)	<ul style="list-style-type: none"> <li>- 2009</li> <li>- Design &amp; Developed by NIC</li> <li>- As and when required</li> <li>- NIC</li> <li>- Ministry of Agriculture and its User</li> </ul>	<a href="http://rkvy.nic.in">http://rkvy.nic.in</a>
8.	Agriculture Extension	<ul style="list-style-type: none"> <li>- 2002-03</li> <li>- Design &amp; Developed by NIC</li> <li>- As and when schemes/other information are provided</li> <li>- DACNET Server</li> <li>- Ministry of Agriculture and Extension functionaries</li> </ul>	<a href="http://vistar.nic.in">http://vistar.nic.in</a>
9.	Department of Agricultural Research and Education	<ul style="list-style-type: none"> <li>- 2005</li> <li>- Department of Agricultural research and Education</li> <li>- weekly/ monthly</li> <li>- NIC Web Server</li> <li>- --</li> </ul>	<a href="http://dare.gov.in">http://dare.gov.in</a>

10.	Directorate of Plant Protection Quarantine and Storage	<ul style="list-style-type: none"> <li>- 2000</li> <li>- Directorate of Plant Protection Quarantine and storage</li> <li>- weekly/ monthly</li> <li>- DACNET SERVER , NIC</li> <li>- --</li> </ul>	<a href="http://ppqs.gov.in">http://ppqs.gov.in</a>
11.	Indian Council of Agricultural Research, Online Library Catalogue	<ul style="list-style-type: none"> <li>- 2008</li> <li>- ICAR Library</li> <li>- -----</li> <li>- NIC Web Server</li> <li>- --</li> </ul>	<a href="http://icarlibrary.nic.in">http://icarlibrary.nic.in</a>
12.	Water Resources	<ul style="list-style-type: none"> <li>- 2000</li> <li>- Ministry of Water Resources</li> <li>- As and when material received (very frequently)</li> <li>- IDC, NICHQ, New Delhi</li> <li>- Common citizen, State Govt., organisations under MoWR, research institutes etc.</li> </ul>	<a href="http://mowr.gov.in">http://mowr.gov.in</a>
13.	Central Insecticide Board and Registration Committee	<ul style="list-style-type: none"> <li>- 2001</li> <li>- CIB&amp;RC, Faridabad</li> <li>- As and when material received (very frequently)</li> <li>- NIC Web Server</li> <li>- Pesticides Industry</li> </ul>	<a href="http://cibrc.nic.in">http://cibrc.nic.in</a>
14.	Plant Quarantine	<ul style="list-style-type: none"> <li>- 2011</li> <li>- DPPQS Faridabad</li> <li>- As and when required</li> <li>- NIC Web Server</li> <li>- Importer, Exporter</li> </ul>	<a href="http://Plantquarantineindia.nic.in">http://Plantquarantineindia.nic.in</a>

15.	Macro Management of Agriculture Scheme	<ul style="list-style-type: none"> <li>- 2008</li> <li>- NIC</li> <li>- As and when required</li> <li>- DACNET Server</li> <li>- It's in public domain, anyone can visit and get benefitted</li> </ul>	<a href="http://dacnet.nic.in/macronew">http://dacnet.nic.in/macronew</a>
16.	National Horticulture Mission	<ul style="list-style-type: none"> <li>- 2006</li> <li>- DAC,M/o Agriculture</li> <li>- Daily, Monthly</li> <li>- NIC</li> <li>- Farmers</li> </ul>	<a href="http://nhm.nic.in">http://nhm.nic.in</a>
17.	National Bamboo Mission	<ul style="list-style-type: none"> <li>- 2007</li> <li>- DAC,M/o Agriculture</li> <li>- Daily, Quarterly</li> <li>- NIC</li> <li>- Farmers</li> </ul>	<a href="http://nbm.nic.in">http://nbm.nic.in</a>
18.	Horticulture Mission of North East and Himalayan States	<ul style="list-style-type: none"> <li>- 2002</li> <li>- DAC,M/o Agriculture</li> <li>- Daily, Monthly</li> <li>- NIC</li> <li>- Farmers</li> </ul>	<a href="http://tmnehs.gov.in">http://tmnehs.gov.in</a>
19.	Directorate of Economics and Statistics	<ul style="list-style-type: none"> <li>- 2008</li> <li>- DES,M/o Agriculture</li> <li>- Daily</li> <li>- NIC</li> <li>- Citizen</li> </ul>	<a href="http://dacnet.nic.in/eands">http://dacnet.nic.in/eands</a>
20.	Commission for Agricultural	<ul style="list-style-type: none"> <li>- 2008</li> <li>- CACP,M/o Agriculture</li> <li>- Daily</li> </ul>	<a href="http://dacnet.nic.in/cacp">http://dacnet.nic.in/cacp</a>

	Costs and Prices	<ul style="list-style-type: none"> <li>- NIC</li> <li>- Citizen</li> </ul>	
21.	Retail Prices Information System	<ul style="list-style-type: none"> <li>- 2005</li> <li>- DES,M/o Agriculture</li> <li>- Weekly, Monthly</li> <li>- NIC</li> <li>- Citizen</li> </ul>	<a href="http://dacnet.nic.in/rpms">http://dacnet.nic.in/rpms</a>
22.	Land use Statistics Information System	<ul style="list-style-type: none"> <li>- 2008</li> <li>- DES,M/o Agriculture</li> <li>- Weekly, Monthly</li> <li>- NIC</li> <li>- Citizen</li> </ul>	<a href="http://dacnet.nic.in/lus">http://dacnet.nic.in/lus</a>
23.	Food Processing Industries	<ul style="list-style-type: none"> <li>- 2009</li> <li>- Developed by M/s Indian Agri Business Systems Pvt Ltd and being maintained by NIC</li> <li>- As and when required</li> <li>- NIC</li> <li>- Stake holders of Food Processing Sector including Entrepreneurs, industry, Exporters, Policy makers, Government</li> </ul>	<a href="http://mofpi.nic.in">http://mofpi.nic.in</a>
24.	Indian institute of Crop Processing technology (IICPT)	<ul style="list-style-type: none"> <li>- 2010</li> <li>- Developed by M/s Umech Pvt Ltd , Chennai and maintained by IICPT</li> <li>- As per Users Requirement</li> <li>- <a href="http://www.amrita.com">www.amrita.com</a></li> <li>- Stakeholders of Agriculture Sector including Entrepreneurs, industry, Exporters, Policy makers, Government , R&amp;D Institutions and Farmers</li> </ul>	<a href="http://www.iicpt.edu.in">http://www.iicpt.edu.in</a>
25.	National Institute for	<ul style="list-style-type: none"> <li>- 2011</li> <li>- Developed by M/s UTIITSL, Bombay &amp; maintained by</li> </ul>	<a href="http://www.niftem.ac.in">http://www.niftem.ac.in</a>

	Food Technology & Entrepreneurship Management(NI FTEM)	NIFTEM - As per Users Requirement - ERNET India - Entrepreneurs, industry, Exporters, Policy makers, Government and existing Institution	
26.	National Meat and Poultry Processing Board(NMPPB)	- 2009 - NIC - As per Users Requirement - NIC - Stakeholders of Meat & Poultry Sector including Entrepreneurs, industry, Exporters, Policy makers & Government	<a href="http://nmppb.gov.in">http://nmppb.gov.in</a>
27.	Department of Animal Husbandry, Dairying and Fisheries	- Site has been active for the past 10 yrs, but in year 2011 these websites have been redesigned according to the Web Compliant Guidelines issued by NIC. - M/s. Ubics India Ltd. - As and when required - NIC Web Server - Dept of Animal Husbandry, Dairying an Fisheries and Delhi Milk Scheme	<a href="http://dahd.nic.in">http://dahd.nic.in</a> <a href="http://dms.nic.in">http://dms.nic.in</a>
28.	AgRIS Project	- 2005  - NIC with identified Resource Partners such as Haryana Agricultural University, Hissar, World Buffalo Trust and SDAU (Sardar Dantiwada Krushinagar, Gujarat)  - As and when required	<a href="http://agris.nic.in">http://agris.nic.in</a>

		<ul style="list-style-type: none"> <li>- NIC</li> <li>- State/District level Agriculture and allied sectors departments</li> </ul>	
29	Farmer's Portal	<ul style="list-style-type: none"> <li>- DAC and NIC</li> <li>- As and when required</li> </ul>	<a href="http://dacnet.nic.in/farmer/new/home-new.html">http://dacnet.nic.in/farmer/new/home-new.html</a>
30	Intradac		<a href="http://intradac.nic.in">http://intradac.nic.in</a>
31	Monitoring System for Agriculture Marketing Infrastructure, Grading & Standardization and Rural Godown Schemes		<a href="http://dacnet.nic.in/amigs">http://dacnet.nic.in/amigs</a>
32	Nav Krishi Programme Scheduling & Management System		<a href="http://dacnet.nic.in/csms">http://dacnet.nic.in/csms</a>
33	Extension Reforms (ATMA) Scheme Activity Monitoring System		<a href="http://dacnet.nic.in/extensi_onreforms">http://dacnet.nic.in/extensi_onreforms</a>

34	Integrated Nutrient Management System		<a href="http://dacnet.nic.in/cfqcti">http://dacnet.nic.in/cfqcti</a>
35	Web-enabled Fertilizer Availability Monitoring System		<a href="http://dacnet.nic.in/fertmonitor">http://dacnet.nic.in/fertmonitor</a>
36	National Centre of Organic Farming		<a href="http://dacnet.nic.in/ncof">http://dacnet.nic.in/ncof</a>
37	Information System for Integrated Pest Management		<a href="http://dacnet.nic.in/ipmweb/iipm.htm">http://dacnet.nic.in/ipmweb/iipm.htm</a>
38	Pest Disease Monitoring System		<a href="http://dacnet.nic.in/pdmis">http://dacnet.nic.in/pdmis</a>
39	Directorate of Economics & Statistics - Crop Production		<a href="http://dacnet.nic.in/apy">http://dacnet.nic.in/apy</a>

## ii. Agricultural Census and Input Survey

NIC is executing the “Computerization of Agricultural Census and Input survey” project for Department of Agriculture and Cooperation on turnkey basis.

The Government of India has been conducting the Agriculture Census since 1970-71. The Census provides crucial information on the structural aspects of Indian Agriculture which continues to be the mainstay of the Indian Economy. An agricultural operational holding is the ultimate unit for taking decision for development of Agriculture at micro level. Aggregation of data is done at various levels of administrative units.

The whole project of Agriculture Census in the country is implemented in three distinct phases, which are statistically linked together but focus on different aspects of agricultural statistics. In Phase-I, a list of holdings with their area and social characteristics and gender of the holders is prepared. In Phase-II, detailed data on agricultural characteristics of holdings are collected from selected villages. In Phase-III, data on input use pattern are collected from selected holdings in selected villages.

### **Phase I and Phase II – Basic Characteristics of Operational Holdings**

During the Phase-I of Census, information on basic characteristics of operational holdings will be collected in the 4 schedules on the following aspects –

- i. Dispersal of holding
- ii. Tenancy/Terms of leasing
- iii. Land Utilization
- iv. Irrigation status and source-wise area irrigated
- v. Cropping pattern

These schedules are as given below -

Schedule L-1: List of resident operational holders and area operated in the village

Schedule L-2: List of non-resident operational holders and area operated in the village

Schedule L-3: Village Summary

Schedule H : Detailed data on operational holding

The information collected under these schedules have been as given below -

#### **Schedule L-1: List of Resident operational holders**

Serial No., Name of the Operational Holder, Holding type (Individual/Joint/Institutional), SC/ST/Others/Institutional, Gender of Operational Holder (M/F/Inst.), Survey/Sub-survey Nos.

and Geographical Area, Area operated in other villages within the same Tehsil, Total area operated, Size Class, Remarks

### **Schedule L-2: List of Non-Resident Operational Holders Operating in the Village**

Serial No., Name of Operational Holder, Type of Holding, Social Group, Gender of the Holder, Survey/Sub-survey Nos. and Geographical Area and Remarks

### **Schedule L-3: Village Summary**

Operated Area held by Resident and Non-Resident Cultivators, Area not covered by Operational Holding

### **Schedule H: Detailed data on operational holding**

#### **Block A1:** Identification Particulars

State, district, Tehsil, Block, sample village, R.I. Circle, Pataki Circle, name of Patwari, Area Unit, Conversion factor of area unit to hectare

#### **Block A2:** Particulars of operational holder

Serial Number, Name of the operational holder, Total survey/sub-survey numbers, Serial number of operational holders as per Col.1 of Schedule-L1, Social Group of operational holder, Area Operated, Size Class, Tenancy Status, Irrigation Status

#### **Block B:** Dispersal of Operated Area

#### **Block C:** Area Operated by Tenancy Status

#### **Block D:** Land Utilization

#### **Block E:** Number of Wells & Tube-wells

#### **Block F:** Net Area Irrigated by Source

#### **Block G:** Crop-wise Area

### **Phase III – Input Survey**

As part of the Agriculture Census, an Input Survey is also organized in the country, after the main Census, to collect information on application of various inputs such as chemical fertilizers, farm-yard manures, pesticides, livestock, agricultural machinery and implements, institutional credit, seed and application of IPM. Information on soil health is proposed to be collected for the first time during Input Survey 2011-12. The first Input Survey in the country was conducted with reference to Agricultural year 1976-77.

Information for Input Survey is collected in the following schedules -

**Schedule-0:** Information on Number of Villages in Tehsils / Blocks

**Schedule-1:** Preparation of Sampling Frame in selected Villages in Tehsils/Blocks

**Schedule-2.0:** Information on selected holdings in Sample Villages in Tehsils/Blocks

**Schedule-2.1:** Parcel wise details of classification of area

**Schedule-2.2:** Area under Irrigated/Un-irrigated Crops and Usage of Fertilizers, Manures and Pesticides

**Schedule-2.3:** Inventory of Livestock

**Schedule-2.4:** Usage of Agricultural Equipments and Machines

**Schedule-2.5:** Agricultural Credit

**Schedule-2.6:** Information on Seeds, IPM and Soil health

Following master directories can be shared / mapped between NeGP – Agriculture Mission Mode Project and Agricultural Census Project

- States
- Specific Crops for each State
- Crops and their Codes
- Fertilizer & Code, Nutrient Content
- Agri. Machinery & Implement and Code, descriptions

## II. State Level

### i. Agricultural Informatics & Communications Network – AGRISNET

AGRISNET is Central Sector Scheme of Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India **conceptualized based on** IT Plan for the Agriculture Sector prepared by National Informatics Centre, May 1998 to facilitate Higher Sustainable Agricultural Productivity and establish “Indian Agriculture On-line”, It is a Core Mission Project of National e-Governance Action Plan 2005 connecting all states and district level agricultural offices to improve information access and advisory services to usher in rural prosperity of India. AGRISNET envisages promotion of e-Governance by use of Information & Communication Technology (ICT). The objective of the programme is to provide IT enabled services to farmers and also for computerization of various offices in the States in agriculture & allied sectors.

Scheme is operational after the approval of EFC in March 2005. Scheme is being implemented in project form based on proposals received from States.

In this section AGRISNET project has been discussed in detail, as it has been envisaged in DPR prepared by NeGP-Agriculture Mission Mode Project that websites developed under AGRISNET projects will be subsumed in NEGP-Agriculture Mission Mode project.

## **Objectives**

- Improve and provide advisory and extension services to farming community using ICT tools
- Development of Farmer centric applications such as Input availability, Soil Health & Mapping etc.
- Improve tracking of Crop Weather situation
- Improve dissemination of Information on Government programs and services
- Improve information exchange within the State and between the State and Centre for better collaboration, planning and implementation of government schemes
- Empowering Farming Communities/ Stakeholders

## **Project Components**

- Development of e-Governance Applications and Portal including content in local languages
- Capacity Building through Human Resource Development
- Establishment of Networking infrastructure
- Establishment of Computing infrastructure

## **Implementation Strategy**

- Implementation by State Department of Agriculture in Project mode
- Implementation Monitoring Committee for project approval and monitoring in DAC
- Financial assistance of Rs. 5 lakhs to State for Preparation of Project Proposal and then for execution of the proposal
- Project duration - Two years
- Focus to implement first in ATMA districts and then replication to all the districts
- Networking using NICNET and/or SWAN for Horizontal connectivity from NICNET/SWAN POP to Agricultural Offices
- Computing Infrastructure: Data Centres at State and District Level, Clients for individual Ag. & Allied offices and related peripherals

## **Deliverables**

- Development of Information Systems for providing online services and information access and dissemination of information through Portal
- Development of Advisory Systems & Extension services
- IT Empowerment to Stakeholders (Government Officials, Research, Education & Extension Scientists, farmers and other service providers such as Community Service Centres and ICT Infrastructure)
- Content creation in English and local languages

## **Outcomes**

- Improved information access and delivery of services to the farming community
- Establishing Agriculture online
- Faster and efficient Redressal of farmer's grievances
- Efficient and improved communication system among all the Agriculture offices in the state through the use of e-mails services and applications
- Improved transparency in decision-making process and accountability of the State
- Direct feedback from farming community to the decision makers in the state
- Better monitoring of government schemes, which directly impact the farmers

## **Proposed Services**

### **Government to Citizen (G2C Services)**

- Soil and Water Conservation Management System
- Integrated Nutrient Management:: Soil & Water Testing, Issuance of Soil Health Card, Nutrients recommendations for Crops
- Integrated Pest Management : Pests & Diseases surveillance, Bio-Control measures, Training & Demonstration at Farmers Field
- Seed Management : Requirement and Distribution of quality Seeds & Plant materials, Seed Testing & Quality Control, Licensing of Seed Agencies
- Fertilizers Management: Requirement, Availability & Distribution, Fertilizer Testing & Quality Control, Registration/ Authorization of Manufacturers & Dealers of Fertilizer and Manures, Bio fertilizer
- Pesticides License, Inspection & sample Collection, Pesticides Testing & Quality control, Requirement, Availability & Distribution
- Requirement and hiring of Farm Machineries & Implements and Subsidies on purchase of equipments
- Weather Watch Information System
- Agro-Advisory information
- Market Intelligence System
- Credit Information System
- Crop Insurance
- Laboratory Management System
- Extension services
- Farmers' Redressal System
- Complaint monitoring system
- Farmers Feedbacks
- Right to Information

- Frequently Asked Questions

### **Intranet Portal Services**

- Bulletin Board
- Notification, Officer orders, Policy guidelines, Plan, documentations, Intra-department memos, Promotions and Transfer, Stores and Inventory
- Personnel Information & Account Section
- Workshop, Demonstrations, Training
- Knowledge Management

### **Government to Government Services (G2G Services)**

- Scheme Monitoring System (Scheme components, physical and financial progress)
- Financial Management System (Budget, Release, Utilization, Expenditure)
- Human Resources Information System & Assets Management

#### **a. State Level Implementation**

Various states are at various levels of implementation of AGRISNET project. Few of these initiatives have been discussed here.

S.N o	State	URL	AGRISNET Services	
1	Himachal Pradesh	<a href="http://www.hpagrisnet.gov.in/defaulteng.aspx">http://www.hpagrisnet.gov.in/defaulteng.aspx</a>	Agriculture	Grievance Redressal Cell
			Animal Husbandry	Veterinary Aid and Health Care
				Cattle & Buffalo Development.
				Sheep & Wool Development.
				Angora Rabbit Breeding Programme.
				Poultry Development
				Horse Breeding Programme
				Feed and Fodder Development
				Dairy Development
				Extension Activities
			Fisheries	Fish Marketing
			Horticulture	Fruit Preservation

				Plant Nutritional Services Bee-Keeping Development Development of Mushroom
			Expert Advisory	
2	Mizoram	Opens west Bengal AGRISNET portal	Homepage <a href="http://agriculturemizoram.nic.in/index.html">http://agriculturemizoram.nic.in/index.html</a>	
3	Orissa	<a href="http://as1.ori.nic.in/agrisnetodisha/">http://as1.ori.nic.in/agrisnetodisha/</a>	Farm Mechanization	
			Fertilizer Registration Certificate	
			Pesticide Licensing System	
			Pest Monitoring System	
			Demonstration Monitoring System	
			Weather Information System	
			Bio-Fertilizer	
			e-Pest Surveillance & Pest Management	
			Online Fertilizer System	
4	Tamil Nadu	<a href="http://www.tnagrisnet.tn.gov.in/website/index.php">http://www.tnagrisnet.tn.gov.in/website/index.php</a>	Market Information	
			Rainfall	
			Reservoir	
			Soil Health Card	
			Village Level Fertility Index	
			Seed Availability	
			Fertilizers Availability	
			Fertilizers Calculator	
			Fertilizers Price Details	
			TNAU Agri Tech Portal	
			Schemes	
			Licensing	
5	West Bengal	<a href="http://wbagrisnet.gov.in/">http://wbagrisnet.gov.in/</a>	Soil Health Card	
			Fertilizer	
			Farmer Advisory	
			Seed	
			Plant Protection	
			Project Monitoring	
			Weather	
			Training	
6	Sikkim	<a href="http://www.sikkimagrismet.org/General/en/Default.aspx">http://www.sikkimagrismet.org/General/en/Default.aspx</a>	Farming	Crops
				Seeds
				Manures

				Water Management
				Vermi-compost
				Plant Protection
				Agricultural Extension
				Organic Certification
				Farmer Detail
				Crop disease detail
				Scheme & Beneficiary detail
				Plot Soil Test Detail
				Soil Farming Practice Detail
				Soil Testing Laboratory
				Land Utilization Details
			Research Technology	Pest Management
				Nutrient Management
				Sikkim Organic Mission
7	Nagaland	http://nagalandagrisnet.com/		Crop Production Programme
				Oil Seed Production Programme
				National Pulses Development Project
				Accelerated Maize Development Programme
				Farmers Training and (Training and Visit) Programme
				Agriculture Technology Management Agency (ATMA)
				National Watershed Development Project for Rainfed Areas (NWDPRA)
				Tea Development
				Farm Machinery
				Land and Farm Water Management
				Agricultural Information and Publicity
				Agriculture Marketing
				Agriculture Education and Training
				Women in Agriculture
				Balance and Integrated Use of Fertilizer
				Agricultural Economics and Statistics
				Plant Protection
8	Madhya Pradesh	http://mpkrishi.org		Information on Package of Practices (PoPs)
				Information on Seeds
				Information on Fertilizers

			Information on Plant Protection Soil Testing Information on Farm Mechanization Information on Agriculture Statistics Information on Fertilizer Quality Information on Seed Quality Information on Schemes Information on Good Agricultural Practices (GAPs)
9	Maharashtra	<a href="http://mahaagri.gov.in/">http://mahaagri.gov.in/</a>	Soil/Water conservation Schemes Inputs Technologies
10	Puducherry	<a href="http://agri.puducherry.gov.in/">http://agri.puducherry.gov.in/</a>	Agricultural Machinery / Implements Subsidy Agricultural Subsidy Ground Water Subsidy Horticultural Subsidy Soil Conservation - Irrigation Subsidy Seeds Certification and Production subsidy
11	Uttar Pradesh	<a href="http://agriculture.up.nic.in/">http://agriculture.up.nic.in/</a>	Seeds Quality Control Kisan Credit Card Fertilizer Soil Testing Plant Protection Seller's Registration Technical Advisory
12	Andhra Pradesh	<a href="http://www.apagrisnet.gov.in/">http://www.apagrisnet.gov.in/</a>	Website developed in Telugu

### West Bengal AGRISNET Case Study

West Bengal AGRISNET Portal has been developed with an objective to create a sustainable data bank of Agricultural Inputs (Soil, Seed, Fertilizer, Pesticides etc.) in the State so that the intended Stakeholders may get relevant e-Services (G2C, G2B & G2G) pertaining to Agriculture and its related activities and may access the same under a single umbrella. Towards fulfilling this objective, following Citizen Centric Web-enabled Applications have been developed and integrated into the portal. West Bengal Agri-portal is an agriculture based portal involving 5

Agricultural sectors viz. Agriculture, Agricultural Marketing, Animal Husbandry, Fisheries and Horticulture. Through this portal, information in different Agricultural Sectors is disseminated to serve citizens at grassroots level. National Informatics Centre (NIC), West Bengal has taken the responsibility of development and maintenance of the portals.

Sl. No.	Name of the Application	Sub-Application(if any)	Citizen Centricity
1	<b>Fertilizer Control Management System</b> 	Online “Fertilizer Registration & Authorization Management System” - FRAMS  Online “Quality Control of Fertilizers” – FQC ( <i>testing of fertilizers</i> )  Arrival Consumption and Supply Management of Fertilizers	<ul style="list-style-type: none"> <li>Availability of Bio/Organic /Physical Mixture/Straight Micronutrient &amp; Micronutrient mixture Fertilizer (Manufacturer/dealer wise).</li> <li>Price (MRP) for each product (chemical fertilizer, Mixed, Micronutrient)</li> <li>Availability of Quality Fertilizers by Farmers</li> <li>Contact Details of Registered Dealers and Wholesalers.</li> </ul>
2	<b>Pesticide Control and Management System - Plant Protection &amp; Quality Control</b> 	Online Pesticide Licensing System – <i>Licensing of dealers of pesticides</i>  Online Testing of Pesticides - <i>for quality control</i>  Plant Protection Training – <i>informative videos on PPQC may be made available through the WBAGRISNET portal</i>	<ul style="list-style-type: none"> <li>On-line Application for Pesticide Licensing</li> <li>On-line approval status tracking</li> <li>Information regarding spurious / misbranded Insecticides</li> <li>Contact Details of Registered Dealers</li> <li>Availability of Quality Pesticide Info</li> </ul>
3	<b>Online Soil Health Card - Soil Test based Fertilizer Recommendation System</b>	NIL	<ul style="list-style-type: none"> <li>Availability of Soil Health Card in real time which includes fertilizer recommendation for crops according to soil test result</li> <li>Minimize delays</li> </ul>

Sl. No.	Name of the Application	Sub-Application(if any)	Citizen Centricity
	 <i>Soil Health Card</i>		<ul style="list-style-type: none"> <li>Nutrient availability status</li> </ul>
4	<b>Integrated Seed Management Information System</b>  <i>Seed</i>	Seed Certification <ul style="list-style-type: none"> <li>Online Registration (of agencies) under Seed Certification Programme</li> <li>Online Seed Certification</li> </ul>	<ul style="list-style-type: none"> <li>District wise availability of quality Seed (variety and Agency wise)</li> <li>District wise Registered seed Dealer details</li> <li>Contact Details of Registered Dealers</li> <li>Availability of different variety of seeds (dealer wise)</li> <li>Availability of Quality Seeds for Farmers</li> </ul>
5	<b>Project Monitoring System</b> <i>- Approval, physical and financial progress of various central and state government projects</i>  <i>Project Monitoring</i>	<ul style="list-style-type: none"> <li>Non Plan Schemes</li> <li>Plan Schemes</li> <li>Pure Central Schemes</li> </ul>	<ul style="list-style-type: none"> <li>Information about 5-Year plans outlay and yearly plan outlay.</li> <li>Information about physical target including SC, ST, General.</li> <li>Budget information for a Financial year</li> <li>Information about allotment.</li> <li>Information about Re-appropriation.</li> <li>Fund release or sub allotment information at Department, Directorate and District level.</li> </ul>

Sl. No.	Name of the Application	Sub-Application(if any)	Citizen Centricity
			<ul style="list-style-type: none"> <li>Information about Expenditure at Department, Directorate and District level.</li> </ul>
6	<b>AGRISNET PORTAL</b> (apps apart from the stipulated ones)	 <ul style="list-style-type: none"> <li>RIMS (<i>Recruitment Management Information System</i>)</li> <li>Circulars</li> <li>Training</li> <li>Contact Information</li> <li>Tenders</li> <li>RTI</li> <li>e-Forms</li> <li>News/Events</li> </ul>	<ul style="list-style-type: none"> <li>Sharing of knowledge and experiences through audio-visual medium</li> <li>Providing training through video based online courses</li> <li>Make available many application under a single umbrella</li> <li>Provide information to citizens through RTI</li> <li>Adopt best practices in Agriculture</li> </ul>
7	<b>BANGLAR KRISHI</b>	 <ul style="list-style-type: none"> <li>Agriculture</li> <li>Pisciculture</li> <li>Horticulture</li> <li>Animal Resources Development</li> <li>Other relevant Information.</li> </ul>	<ul style="list-style-type: none"> <li>Farmers can share farming related problems through the portal</li> <li>Farmer will get Expert opinion related to his problem through the portal</li> <li>Details about Citizen Centric Schemes</li> <li>Downloadable Forms</li> <li>Contact details of Key officials of the department up to Block level</li> <li>Frequently asked questions</li> <li>News Headlines</li> <li>Notifications</li> <li>Feedback can be given through the website and action taken status can be known from the portal</li> </ul>

Sl. No.	Name of the Application	Sub-Application(if any)	Citizen Centricity
			<ul style="list-style-type: none"> <li>• Citizens can directly contact nodal officers through the website</li> <li>• Linkage with related sites are available</li> </ul>

### **Key Implementation Challenges**

- Lack of proper ICT Infrastructure at the sites of implementation
- Lack of Direct Telephone facility at Testing Laboratories which is needed for establishment of Internet connectivity at the Laboratory – either through Broadband or dial-up
- Establishment of seamless connectivity at Testing Laboratories for uploading data related to Sample Registration & Test Results from Laboratories to make the services (like Soil Health Cards) available through CSC
- Identification of Appropriate Human Resources with adequate training, handholding and attitude
- Sensitization of the Farmers / Business houses / Citizens on utility and impact of the AGRISNET Applications for getting better service
- Formation of a delivery framework and finalize a mechanism for making the services available to the citizen at various levels
- The establishment of connectivity among the different offices at Department / Directorate-HQ / District / Sub-Division / Blocks is the major challenge of implementation of AGRISNET Project

### **Field Experiences during Implementation**

- Proper orientation of Officials responsible for implementation towards benefits of e-Governance and ultimate impact of computerization
- Awareness build up on General Computer Concepts and Generic and Specific Applications through Capacity Building
- Sensitization of the Stakeholders is needed during pilot implementation
- Availability of Internet Connectivity up to Grass Root level (ADOs in Blocks)
- Availability of Seamless connectivity (LAN & WAN) at all levels of the Department
- Development of Human Resources through Capacity & Capability Building Programmes
- Availability of requisite ICT Infrastructure at the identified locations of AGRISNET implementation

## ii. Other Initiatives in States

Sl. No	Name of the State	Name of the Website	Description (Year, Implemented by, Updation frequency, Hosted at, stakeholders)	URL
1.	<b>Assam</b>	Assam Small Farmers' Agri Business Consortium	<ul style="list-style-type: none"> <li>- 2005</li> <li>- Assam Small Business Agri-Business Consortium</li> <li>- -</li> <li>- NIC</li> <li>- Farmers, traders, common people</li> </ul>	<a href="http://assamagribusiness.nic.in">http://assamagribusiness.nic.in</a>
		North Eastern Region Farm Machinery Training & Testing Institute	<ul style="list-style-type: none"> <li>- 2002</li> <li>- NIC</li> <li>- Frequency not fixed</li> <li>- NIC</li> <li>- Farmers</li> </ul>	
		Department of Fisheries	<ul style="list-style-type: none"> <li>- 2010</li> <li>- Directorate of Fisheries, Assam</li> <li>- -</li> <li>- Not known</li> <li>- Fish farmers, Fishery entrepreneurs, Govt.</li> </ul>	<a href="http://assamfishery.info/index.php">http://assamfishery.info/index.php</a>
		Assam Rural Infrastructure And Agricultural Services (Arias) Society	<ul style="list-style-type: none"> <li>- -</li> <li>- Assam Agricultural Competitiveness Project (AACP)</li> <li>- -</li> <li>- -</li> <li>- -</li> </ul>	<a href="http://www.arias.in/">http://www.arias.in/</a>
		North Eastern Regional Agricultural Marketing Corporation Ltd.	<ul style="list-style-type: none"> <li>- -</li> <li>- North Eastern Regional Agricultural Marketing Corporation Ltd.</li> <li>-</li> </ul>	<a href="http://www.neramac.com">http://www.neramac.com</a>

			<ul style="list-style-type: none"> <li>- Farmer, entrepreneurs (food preservation)</li> </ul>	
2	<b>Andaman and nicobar</b>	Dept. of Agriculture	<ul style="list-style-type: none"> <li>- -</li> <li>- Directorate of Agriculture</li> <li>- Monthly</li> <li>- NIC Andaman State Unit, A &amp; N Islands</li> <li>- Farmers</li> </ul>	<a href="http://agri.and.nic.in">http://agri.and.nic.in</a>
		Krishi Vigyan Kendra	<ul style="list-style-type: none"> <li>- -</li> <li>- Krishi Vigyan Kendra</li> <li>- Monthly</li> <li>- NIC Andaman State Unit, A &amp; N Islands</li> <li>- Farmers</li> </ul>	<a href="http://kvkcarj.and.nic.in/">http://kvkcarj.and.nic.in/</a>
3	<b>Chattisgarh</b>	Agriculture Portal (Department of Agriculture)	<ul style="list-style-type: none"> <li>- 2009</li> <li>- NIC, Chhattisgarh</li> <li>- As and When required</li> <li>- Delhi NIC data center</li> <li>- Chhattisgarh Agriculture department</li> </ul>	<a href="http://agridept.cg.gov.in">http://agridept.cg.gov.in</a>
		Agriculture Subsidy (Department of Agriculture)	<ul style="list-style-type: none"> <li>- 2009</li> <li>- NIC, Chhattisgarh</li> <li>- Daily</li> <li>- Delhi NIC data center</li> <li>- Farmers</li> </ul>	<a href="http://cg.nic.in/agrisubsidy">http://cg.nic.in/agrisubsidy</a>
		Agri MIS	<ul style="list-style-type: none"> <li>- 2009</li> <li>- NIC, Chhattisgarh</li> <li>- Monthly</li> <li>- Delhi NIC data center</li> <li>- Agriculture department</li> </ul>	<a href="http://cg.nic.in/agrimis">http://cg.nic.in/agrimis</a>
		Agri Budget System	<ul style="list-style-type: none"> <li>- 2010</li> <li>- NIC, Chhattisgarh</li> <li>- Monthly</li> </ul>	<a href="http://cg.nic.in/agribudget">http://cg.nic.in/agribudget</a>

			<ul style="list-style-type: none"> <li>- Delhi NIC data center</li> <li>- Agriculture department</li> </ul>	
		Agri Mandi	<ul style="list-style-type: none"> <li>- 2010</li> <li>- NIC, Chhattisgarh</li> <li>- Monthly</li> <li>- Delhi NIC data center</li> <li>- Mandi Board</li> </ul>	<a href="http://cg.nic.in/agrimandi">http://cg.nic.in/agrimandi</a>
		Mandi Board Website	<ul style="list-style-type: none"> <li>- 2010</li> <li>- NIC, Chhattisgarh</li> <li>- As and When required</li> <li>- Delhi NIC data center</li> <li>- Mandi Board</li> </ul>	<a href="http://samb.cg.gov.in">http://samb.cg.gov.in</a>
4	<b>Jammu and kashmir</b>	Department of Agriculture	<ul style="list-style-type: none"> <li>- 2011</li> <li>- NIC</li> <li>- -</li> <li>- NIC</li> <li>- -</li> </ul>	<a href="http://jkapd.nic.in">http://jkapd.nic.in</a>
5	<b>Karnataka</b>	Department of Agriculture	<ul style="list-style-type: none"> <li>- 2000</li> <li>- NIC, Karnataka State Unit</li> <li>- Daily</li> <li>- NIC Koramangala</li> <li>- Farmers and related department</li> </ul>	<a href="http://raitamitra.kar.nic.in">http://raitamitra.kar.nic.in</a>
		Department of Agriculture	<ul style="list-style-type: none"> <li>- 2002</li> <li>- NIC, KSU</li> <li>- Monthly</li> <li>- NIC Koramangala</li> <li>- Agriculture Department</li> </ul>	<a href="http://stg1.kar.nic.in/mmr/">http://stg1.kar.nic.in/mmr/</a> <a href="http://stg1.kar.nic.in/mmrstate">http://stg1.kar.nic.in/mmr state</a>
		Department of Agriculture	<ul style="list-style-type: none"> <li>- 2010</li> <li>- NIC, Karnataka State Unit</li> <li>- Daily</li> <li>- NIC Koramangala</li> <li>- Agriculture Department</li> </ul>	<a href="http://stg4.kar.nic.in/aiss/">http://stg4.kar.nic.in/aiss/</a>
		Department of Agriculture	<ul style="list-style-type: none"> <li>- 2011</li> <li>- NIC, Karnataka State Unit</li> <li>- Daily</li> <li>- NIC Koramangala</li> </ul>	<a href="http://stg3.kar.nic.in/suvarna/">http://stg3.kar.nic.in/suvarna/</a>

			<ul style="list-style-type: none"> <li>- Farmers and 7 other line departments</li> </ul>	
		Department of Agriculture	<ul style="list-style-type: none"> <li>- 2010</li> <li>- NIC, Karnataka State Unit Daily</li> <li>- NIC Koramangala</li> <li>- Farmers, Dealers and Department</li> </ul>	<a href="http://164.100.80.122/agri_dealer/">http://164.100.80.122/agri_dealer/</a>
		Agriculture Marketing	<ul style="list-style-type: none"> <li>- 2002</li> <li>- NIC, Karnataka State Unit Daily</li> <li>- NIC Koramangala</li> <li>- Farmers, APMC, Business people</li> </ul>	<a href="http://krishimaratavahini.kar.nic.in">http://krishimaratavahini.kar.nic.in</a>
		Animal Husbandry and veterinary science	<ul style="list-style-type: none"> <li>- 2011</li> <li>- NIC, Karnataka State Unit As and When required</li> <li>- NIC Koramangala</li> <li>- Farmers and 7 other line departments</li> </ul>	<a href="http://www.ahvs.kar.nic.in">http://www.ahvs.kar.nic.in</a>
6	<b>Kerala</b>	Dept. of Agriculture	<ul style="list-style-type: none"> <li>- -</li> <li>- Owned by dept</li> <li>- As and When required</li> <li>- State data center</li> <li>- -</li> </ul>	<a href="http://www.keralaagriculture.gov.in">http://www.keralaagriculture.gov.in</a> <a href="http://karshika.keralam">karshika keralam</a>
		Kerala agriculture university, market intelligence	<ul style="list-style-type: none"> <li>- 2009</li> <li>- Kerala agriculture university, market intelligence</li> <li>- All type of transactions are available</li> <li>- NIC data centre</li> <li>- Farmers, all stakeholders, govt employees</li> </ul>	<a href="http://amickau.nic.in">http://amickau.nic.in</a>
		Farm Information Bureau, Dept of Agriculture, Govt. of kerala	<ul style="list-style-type: none"> <li>- 2010</li> <li>- -</li> <li>- -</li> <li>- State data centre</li> </ul>	

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		Kissan Kerala		<a href="http://www.kissankerala.net">http://www.kissankerala.net</a>
		Kerala Agriculture University		<a href="http://www.kau.edu">http://www.kau.edu</a>
		e-krishi		<a href="http://e-krishi.org/">http://e-krishi.org/</a>
		ATMA kottayam		<a href="http://www.atmakottayam.gov.in/">http://www.atmakottayam.gov.in/</a>
		Dept. of Fisheries	<ul style="list-style-type: none"> <li>- 2008</li> <li>- -</li> <li>- -</li> <li>- State data centre</li> <li>- Fishermen, govt, govt employees</li> </ul>	<a href="http://fishnetkerala.gov.in">http://fishnetkerala.gov.in</a>
		CMFRI, Kochi, Kerala		<a href="http://www.cmfri.com">http://www.cmfri.com</a>
		CIFT, Kochi, Kerala		<a href="http://www.cift.res.in/">http://www.cift.res.in/</a>
		MPEDA		<a href="http://www.mpeda.com/">http://www.mpeda.com/</a>
		Integrated Fisheries Project, Kochi		<a href="http://www.ifpkochi.nic.in/">http://www.ifpkochi.nic.in/</a>
		Central Institute of Fisheries Nautical and Engineering Trainining, Kochi		<a href="http://www.cifnet.nic.in/">http://www.cifnet.nic.in/</a>
7	<b>Nagaland</b>	Department of Agriculture	<ul style="list-style-type: none"> <li>- --</li> <li>- Agri Department</li> <li>- nil</li> <li>- IDC NIC Hqrs</li> <li>- Govt, &amp; Citizen</li> </ul>	<a href="http://agringl.nic.in">http://agringl.nic.in</a>
8	<b>Odissa</b>	Department of Agriculture	<ul style="list-style-type: none"> <li>- 2011</li> <li>- TQM Solutions Ltd., Bhubaneswar ,Odisha As and When required</li> <li>- At private site</li> <li>- Directorate of Agriculture, Govt. Odisha</li> </ul>	<a href="http://agriodisha.org">http://agriodisha.org</a>

			and common citizens	
9	<b>West Bengal</b>	AGRISNET (Department of Agriculture)	<ul style="list-style-type: none"> <li>- 2009</li> <li>- NIC, West Bengal State Centre</li> <li>- As and When required</li> <li>- NIC – HQ</li> <li>- Department of Agriculture, Government of West Bengal</li> <li>- Department of Agriculture, Government of Meghalaya ( The Applications are being customized in West Bengal for implementation in Meghalaya)</li> <li>- Department of Agriculture, Government of Mizoram ( The Applications are being customized in West Bengal for implementation in Meghalaya)</li> <li>- Department of Agriculture and Co-operation, Govt. of India ( Senior officers of DAC are accessing the Applications and sending their feedback)</li> <li>- Department of Agriculture, Governments of Madhya Pradesh, Karnataka and Andhra Pradesh, who are assessing the available applications to test their suitability.</li> <li>- Farmers, Licensees, officials in Soil Testing Labs of West Bengal, Mizoram and Meghalaya</li> </ul>	<a href="http://www.wbagrisnet.gov.in">www.wbagrisnet.gov.in</a>

### iii. Sector wise, department wise ICT Initiatives taken in pilot States

State	Sector	Department	Website
Madhya Pradesh	Agriculture	Department of farmer welfare and agriculture development	<a href="http://www.mpkrishi.org">www.mpkrishi.org</a>
		Madhya Pradesh Agriculture Marketing Board	<a href="http://www.mpmandiboard.org/">www.mpmandiboard.org/</a>
		Krishak Jagat-weekly Agriculture newspaper	<a href="http://www.krishakjagat.org/">www.krishakjagat.org/</a>
	Horticulture	Horticulture & Food processing department, Government of MP	<a href="http://ldemo.mp.nic.in/horticulture/">http://ldemo.mp.nic.in/horticulture/</a>
		Department of Horticulture, District Bhopal	<a href="http://bhopal.nic.in/districtbhopal/Udhyan_Yojna8.htm">http://bhopal.nic.in/districtbhopal/Udhyan_Yojna8.htm</a>
	Dairy	Madhya Pradesh State Cooperative Dairy Federation Limited	<a href="http://www.mpcdf.nic.in/">www.mpcdf.nic.in/</a>
	Fisheries	Department of Fisheries	<a href="http://mpfisheries.in">http://mpfisheries.in</a>
		Directorate of Fisheries	<a href="http://www.dif.mp.gov.in">http://www.dif.mp.gov.in</a>
		Madhya Pradesh Fisheries Department	<a href="http://www.mpfisheries.gov.in">http://www.mpfisheries.gov.in</a>
		MP Fisheries Federation	<a href="http://mpfishfed.mpeprocurement.gov.in/common/home.asp">http://mpfishfed.mpeprocurement.gov.in/common/home.asp</a>
	Livestock & Poultry	MP State Livestock and Poultry Development Corporation	<a href="http://www.mplivestock.com">http://www.mplivestock.com</a>
		Plastik MP	<a href="http://www.plastik-mp.com/en/handling-solutions/system-for-the-poultry-industry.html">http://www.plastik-mp.com/en/handling-solutions/system-for-the-poultry-industry.html</a>
	Animal husbandry	Department of Animal Husbandry	<a href="http://www.mpdah.gov.in/Hindi/default.aspx">http://www.mpdah.gov.in/Hindi/default.aspx</a>

		Department of Veterinary and Animal Husbandry, District Bhopal, MP	<a href="http://www.bhopal.nic.in/districtbhopal/Pashu/avedanprarup6.htm">http://www.bhopal.nic.in/districtbhopal/Pashu/avedanprarup6.htm</a>
		High Security Animal Disease Laboratory	<a href="http://www.hsaln.nic.in/">www.hsaln.nic.in/</a>
	Assam Government website		<a href="http://assamgovt.nic.in/departments/agriculture_dept.asp">http://assamgovt.nic.in/departments/agriculture_dept.asp</a>
Assam	Agriculture and Irrigation	Assam Rural Infrastructure And Agricultural Services (ARIAS) or Assam Agricultural Competitiveness Project (AACP)	<a href="http://www.arias.in/">http://www.arias.in/</a>
		Assam State Agricultural Marketing Board	<a href="http://asamb.in">http://asamb.in</a>
		Agriculture and Irrigation in Assam	<a href="http://online.assam.gov.in/agricultureandirrigation">http://online.assam.gov.in/agricultureandirrigation</a>
		Assam Small Business Agri-Business Consortium	<a href="http://assamagribusiness.nic.in">http://assamagribusiness.nic.in</a>
		North Eastern Regional Agricultural Marketing Corporation Ltd.	<a href="http://www.neramac.com">http://www.neramac.com</a>
		Directorate of Economics & Statistics, Government of Assam	<a href="http://ecostatassam.nic.in/">http://ecostatassam.nic.in/</a>
		Department of Irrigation, Govt. of Assam	<a href="http://irrigassam.nic.in/index.htm">http://irrigassam.nic.in/index.htm</a>
	Fisheries		<a href="http://www.assamfishery.info/">http://www.assamfishery.info/</a>
		Department of Fisheries, Govt. of Assam	<a href="http://assamgovt.nic.in/departments/fishery_dept.asp">http://assamgovt.nic.in/departments/fishery_dept.asp</a>
			<a href="http://db.nedfi.com/content/fishery-assam">http://db.nedfi.com/content/fishery-assam</a>
			<a href="http://online.assam.gov.in/fishery">http://online.assam.gov.in/fishery</a>

		Assam Cooperative fish Marketing and Processing Federation Ltd. Shortly referred, as FishFED	<a href="http://www.fishfedassam.org/">http://www.fishfedassam.org/</a>
	Animal husbandry	Animal Husbandry and Veterinary Department	<a href="http://assamgovt.nic.in/departments/animal_dept.asp">http://assamgovt.nic.in/departments/animal_dept.asp</a>
		National Research Centre on PIG, Rani	<a href="http://www.nrcc.in/">http://www.nrcc.in/</a>
Kerala	Agriculture	Department of Agriculture	<a href="http://www.keralaagriculture.gov.in/">http://www.keralaagriculture.gov.in/</a>
		Department of Agriculture	<a href="http://www.kissankerala.net/">http://www.kissankerala.net/</a>
		Agriculture university	<a href="http://www.kau.edu/">http://www.kau.edu/</a>
		Market Information	<a href="http://amickau.nic.in">http://amickau.nic.in</a>
		Agriculture, Technology Management Agency	<a href="http://www.atmakottayam.gov.in">http://www.atmakottayam.gov.in</a>
	Marine product Exports	Marine product Exports	<a href="http://www/mpeda.com">http://www/mpeda.com</a>
	Fisheries	Department of Fisheries, Training	<a href="http://ifpkochi.nic.in">http://ifpkochi.nic.in</a>
		Department of Fisheries	<a href="http://www.cifnet.nic.in">http://www.cifnet.nic.in</a>
		Department of Fisheries	<a href="http://www.fisheries.kerala.gov.in">http://www.fisheries.kerala.gov.in</a>
		Green Mussel, Pernaviridis , Farming in Kerala	<a href="http://eprints.cmfrri.org.in">http://eprints.cmfrri.org.in</a>
		Fisheries Network Information System	<a href="http://www.fishnetkerala.gov.in">http://www.fishnetkerala.gov.in</a>
		College of Fisheries, Panangad	<a href="http://www.kau.edu/cofishpanangad.htm">http://www.kau.edu/cofishpanangad.htm</a>
		Central Institute of Fisheries Technology, Cochin	<a href="http://www.icar.org.in/files/ICAR-ITP-2010/cift.pdf">http://www.icar.org.in/files/ICAR-ITP-2010/cift.pdf</a>
	Diary	Diary development board	<a href="http://www.dairy.kerala.gov.in/">http://www.dairy.kerala.gov.in/</a>

	Livestock	Livestock	<a href="http://www.livestock.kerala.gov.in/">http://www.livestock.kerala.gov.in/</a>
	Poultry	Poultry Development Board	<a href="http://kepcnic.in/index.html">http://kepcnic.in/index.html</a>
	Horticulture	Vegetable & Fruit Promotion council	<a href="http://www.vfpck.org">http://www.vfpck.org</a>
	Animal husbandry	Animal Husbandry	<a href="http://www.ahdkerala.gov.in/">http://www.ahdkerala.gov.in/</a>
Karnataka	Agriculture	Department of Agriculture	<a href="http://raitamitra.kar.nic.in/">http://raitamitra.kar.nic.in/</a>
		Department of Agriculture	<a href="http://stg1.kar.nic.in/mmr/">http://stg1.kar.nic.in/mmr/</a>
		Department of Agriculture	<a href="http://stg1.kar.nic.in/mmrstate">http://stg1.kar.nic.in/mmrstate</a>
		Department of Agriculture	<a href="http://stg3.kar.nic.in/suvarna/">http://stg3.kar.nic.in/suvarna/</a>
		Department of Agriculture	<a href="http://164.100.80.122/agrdealer/">http://164.100.80.122/agrdealer/</a>
		Karnataka State Seed certification Agency (KSSCA)	<a href="http://kssca.kar.nic.in">http://kssca.kar.nic.in</a>
		Agriculture Marketing	<a href="http://krishimaratavahini.kar.nic.in">http://krishimaratavahini.kar.nic.in</a>
		Karnataka State Agriculture Produce Processing & Export Corporation Limited	<a href="http://kappec.kar.gov.in">http://kappec.kar.gov.in</a>
		Cooperative Department	<a href="http://sahakara.kar.gov.in/">http://sahakara.kar.gov.in/</a>
		Horticulture	<a href="http://www.horticulture.kar.nic.in/">http://www.horticulture.kar.nic.in/</a>
		Animal husbandry	<a href="http://www.ahvs.kar.nic.in/">http://www.ahvs.kar.nic.in/</a>
		Veterinary University	<a href="http://www.kvafsu.kar.nic.in/">http://www.kvafsu.kar.nic.in/</a>
		Livestock	<a href="http://slbtc.kar.nic.in/">http://slbtc.kar.nic.in/</a>
	Dairy	Dairy, Nandini	<a href="http://www.kmfnnandini.coop/">http://www.kmfnnandini.coop/</a>
		Mother Dairy	<a href="http://www.motherdairy.com/MotherDairyPages/home.aspx">http://www.motherdairy.com/MotherDairyPages/home.aspx</a>
	Fisheries	Karnataka Fisheries Development Corporation	<a href="http://www.karnatakafisheries.com/">http://www.karnatakafisheries.com/</a>
	Sericulture	Karnataka Sericulture	<a href="http://reshmesiri.kar.nic.in">http://reshmesiri.kar.nic.in</a>
		Cocoon Price Information System	<a href="http://reshmesiri.kar.nic.in-sericulture/">http://reshmesiri.kar.nic.in-sericulture/</a>

	Sugar	Karnataka Sugar Institute	<a href="http://salcogen.gov.in">http://salcogen.gov.in</a>
	Watershed	Watershed	<a href="http://watershed.kar.nic.in">http://watershed.kar.nic.in</a>
	Drought Monitoring Cell	Drought Monitoring Cell	<a href="http://dmc.kar.nic.in">http://dmc.kar.nic.in</a>
		Agriculture University	<a href="http://www.uasd.edu/">http://www.uasd.edu/</a>
	Universities	University of Agricultural Sciences Bangalore	<a href="http://www.uasbangalore.edu.in/">http://www.uasbangalore.edu.in/</a>
		University of Agricultural Sciences, Dharwad	<a href="http://www.bagalkot.nic.in/UHS/hortmain.htm">http://www.bagalkot.nic.in/UHS/hortmain.htm</a>
Jharkhand	Official website	Official website of Jharkhand	<a href="http://www.jharkhand.gov.in">www.jharkhand.gov.in</a>
	Agriculture University	Birsa Agriculture University	<a href="http://www.bau-eagriculture.com">www.bau-eagriculture.com</a>
			<a href="http://www.baujharkhand.org/">http://www.baujharkhand.org/</a>
	Soil Conservation	Department of Soil Conservation	<a href="http://www.jharkhandsoil.gov.in">www.jharkhandsoil.gov.in</a>
	SAMETI		<a href="http://www.sameti.org">www.sameti.org</a>
	State Agriculture Marketing Dept.		<a href="http://jsamb.nic.in">http://jsamb.nic.in</a>
	Fisheries	Fisheries Department	<a href="http://jharfish.com">http://jharfish.com</a>
	Horticulture	Horticulture Department	<a href="http://www.nhmjharkhand.org">www.nhmjharkhand.org</a>
	ATMA	ATMA	<a href="http://www.atmadumka.org">www.atmadumka.org</a>
			<a href="http://www.atmajamtara.org">www.atmajamtara.org</a>
			<a href="http://www.atmagarhwa.org">www.atmagarhwa.org</a>
			<a href="http://www.atmabokaro.org">www.atmabokaro.org</a>
			<a href="http://www.atmadhanbad.org">www.atmadhanbad.org</a>
			<a href="http://www.atmakoderma.org">www.atmakoderma.org</a>
			<a href="http://www.atmagiridih.org">www.atmagiridih.org</a>

			<a href="http://www.atmalohardaga.org">www.atmalohardaga.org</a>
			<a href="http://www.atmagumla.org">www.atmagumla.org</a>
Assam	Government of Assam		<a href="http://assamgovt.nic.in/departments/agriculture_dept.asp">http://assamgovt.nic.in/departments/agriculture_dept.asp</a>
	Rural Infrastructure and agriculture services societies (ARIS)		<a href="http://www.arias.in/">http://www.arias.in/</a>
	Assam Small Farmers Agri Business Consortium		<a href="http://assamagribusiness.nic.in/agrifirst.htm">http://assamagribusiness.nic.in/agrifirst.htm</a>
	Agriculture university	Assam Agriculture University	<a href="http://www.aau.ac.in">http://www.aau.ac.in</a>
Himachal Pradesh	Official Website of Himachal Pradesh		<a href="http://himachal.nic.in">http://himachal.nic.in</a>
	Website of Himachal Pradesh AGRISNET		<a href="http://hpagrisnet.gov.in/">http://hpagrisnet.gov.in/</a>
	Website of Department of Agriculture		<a href="http://hpagrisnet.gov.in/agriculture/default.aspx">http://hpagrisnet.gov.in/agriculture/default.aspx</a>
	Website of Department of Animal Husbandry		<a href="http://hpagrisnet.gov.in/animal-husbandry/default.aspx">http://hpagrisnet.gov.in/animal-husbandry/default.aspx</a>
	Website of Department of Fisheries		<a href="http://hpagrisnet.gov.in/fisheries/default.aspx">http://hpagrisnet.gov.in/fisheries/default.aspx</a>

	Website of Department of Horticulture	<a href="http://hpagrisnet.gov.in/horticulture/default.aspx"><u>http://hpagrisnet.gov.in/horticulture/default.aspx</u></a>	
University	Website of Dr. Yashwant Singh Parmar University of Horticulture and Forestry	<a href="http://www.yspuniversity.ac.in/"><u>http://www.yspuniversity.ac.in/</u></a>	
	Website of CSK Himachal Pradesh Agricultural University, Palampur (INDIA)	<a href="http://www.hillagric.ernet.in/"><u>http://www.hillagric.ernet.in/</u></a>	
	Website of State Agricultural Management & Extension Training Institute Shimla	<a href="http://sametihp.com/"><u>http://sametihp.com/</u></a>	
Maharashtra	Website of Department of Agriculture, Maharashtra	<a href="http://mahaagri.gov.in"><u>http://mahaagri.gov.in</u></a>	
	Meteorological Websites	Regional Meteorological Centre Mumbai	<a href="http://www.imdmumbai.gov.in"><u>http://www.imdmumbai.gov.in</u></a>
		Regional Meteorological Centre Nagpur	<a href="http://imdnapur.gov.in"><u>http://imdnapur.gov.in</u></a>
		India Meteorological Department, Pune	<a href="http://imdpune.gov.in"><u>http://imdpune.gov.in</u></a>
	Website of Department of Marketing	<a href="http://www.msamb.com"><u>http://www.msamb.com</u></a>	
	Horticulture	Website of Department of Maharashtra Horticulture Mission	<a href="http://www.mahanhm.com"><u>http://www.mahanhm.com</u></a>

	Website of Maharashtra State Seeds Corporation	<a href="http://www.mahabeej.com"><u>http://www.mahabeej.com</u></a>
	Maharashtra State Warehousing Corporation	<a href="http://www.mswarehousing.com/english"><u>http://www.mswarehousing.com/english</u></a>
	Small Farmers Agribusiness Consortium	<a href="http://mahaagri.gov.in/SFACNew/index.html"><u>http://mahaagri.gov.in/SFACNew/index.html</u></a>
	Dairy	Maharashtra State Dairy Development Department <a href="http://dairy.adfmaharashtra.in"><u>http://dairy.adfmaharashtra.in</u></a>
University	Website of Dr Balasaheb Sawant Konkan Krishi Vidyapeeth	<a href="http://www.dbskkv.org"><u>http://www.dbskkv.org</u></a>
	Website of Dr Panjabrao Deshmukh Krishi Vidyapeet	<a href="http://www.pdkv.ac.in"><u>http://www.pdkv.ac.in</u></a>
	Website of Mahatma Phule Krishi Vidyapeeth	<a href="http://mpkv.mah.nic.in"><u>http://mpkv.mah.nic.in</u></a>
	Website of Marathwada Agricultural University	<a href="http://mkv2.mah.nic.in"><u>http://mkv2.mah.nic.in</u></a>
	M.C.A.E.R.	<a href="http://www.mcaer.org/main/index.php"><u>http://www.mcaer.org/main/index.php</u></a>
	Maharashtra Animal & Fishery Sciences University	<a href="http://www.mafsu.in"><u>http://www.mafsu.in</u></a>
Statistics	Rainfall	<a href="http://mahaagri.gov.in/rainfall/index.asp"><u>http://mahaagri.gov.in/rainfall/index.asp</u></a>
	Crop watch	<a href="http://mahaagri.gov.in/cropwatch/asp/mlogin.asp"><u>http://mahaagri.gov.in/cropwatch/asp/mlogin.asp</u></a>
Soil/Water Conservation	Perspective Plan	<a href="http://mahaagri.gov.in/SoilConProsPlan/scn.htm"><u>http://mahaagri.gov.in/SoilConProsPlan/scn.htm</u></a>
Projects and Plans : IESA Report	Maharashtra Agricultural Competitiveness Project	<a href="http://msamb.com/english/projects/MACP.htm"><u>http://msamb.com/english/projects/MACP.htm</u></a>

Maharashtra Government	Govt. of Maharashtra	<a href="http://maharashtra.gov.in/Pages/Home.aspx">http://maharashtra.gov.in/Pages/Home.aspx</a>
Crop Weather : Rainfall	Rainfall	<a href="http://mahaagri.gov.in/rainfall/index.asp">http://mahaagri.gov.in/rainfall/index.asp</a>
Publication : Krishi Dainandini	Marathwada Krishi Vidyapeeth Parbhani	<a href="http://mkv2.mah.nic.in/diary11/AGRI11.htm">http://mkv2.mah.nic.in/diary11/AGRI11.htm</a>
SMS Services	MAHAAGRI SMS	<a href="http://www.mahaagrism.com/default.aspx?AspxAutoDetectCookieSupport=1">http://www.mahaagrism.com/default.aspx?AspxAutoDetectCookieSupport=1</a>
Important Links : Other Agriculture Related Websites	The Maharashtra Agro Industries Development Corporation Ltd (MAIDC)	<a href="http://www.maidcmumbai.com">http://www.maidcmumbai.com</a>
	Mahratta Chamber of Commerce Industries and Agriculture (MCCIA)	<a href="http://www.mcciapune.com">www.mcciapune.com</a>
	sheti.com	<a href="http://www.sheti.com">www.sheti.com</a>
	Vasantrao Naik Sheti Swavlamban Mission, Amravati	<a href="http://www.vnss-mission.gov.in">http://www.vnss-mission.gov.in</a>
Important Links	Maharashtra State Warehousing Corporation	<a href="http://www.mswarehousing.com/english">http://www.mswarehousing.com/english</a>
	Maharashtra State Small Farmers Agribusiness Consortium	<a href="http://mahaagri.gov.in/SFACNew/index.html">http://mahaagri.gov.in/SFACNew/index.html</a>
	Maharashtra Animal & Fishery Sciences University	<a href="http://www.mafsu.in">http://www.mafsu.in</a>
	Central Institute of Fisheries Education	<a href="http://www.cife.edu.in">http://www.cife.edu.in</a>
	The Marine Products Export Development Authority	<a href="http://www.mpeda.com">http://www.mpeda.com</a>
	Fisheries College, Shirgaon, Ratnagiri	<a href="http://www.dbskkv.org/education/education_fira.html">http://www.dbskkv.org/education/education_fira.html</a>
Online Micro Irrigation	National Mission on Micro Irrigation (NMMI) Scheme	<a href="http://mahanhm.gov.in/testmahdrip/admin/index.php">http://mahanhm.gov.in/testmahdrip/admin/index.php</a>

Krushi Vidyan Kendra	Krishi Vidyan Kendra, Babhaleshwar, Ahmednagar	<a href="http://www.kvk.pravara.com">http://www.kvk.pravara.com</a>
	Krishi Vigyan Kendra Akola	<a href="http://kvkakola.org">http://kvkakola.org</a>
	Krishi Vigyan Kendra Ghatkhed Amaravati	<a href="http://www.kvkamravati.org">http://www.kvkamravati.org</a>
	Krishi Vigyan Kendra Beed	<a href="http://www.drikvkbeed.org">http://www.drikvkbeed.org</a>
	Krishi Vigyan Kendra Buldhana	<a href="http://www.kvkbuldhana.org">http://www.kvkbuldhana.org</a>
	Krishi Vigyan Kendra Chandrapur	<a href="http://kvkchandrapur.org">http://kvkchandrapur.org</a>
	Krishi Vigyan Kendra Gondia	<a href="http://kvkgondia-pdkv.org">http://kvkgondia-pdkv.org</a>
	Krishi Vigyan Kendra Hingoli	<a href="http://www.kvkhingoli.com">http://www.kvkhingoli.com</a>
	Krishi Vigyan Kendra Kolhapur	<a href="http://www.kvkkolhapur.com">http://www.kvkkolhapur.com</a>
	Krishi Vigyan Kendra Nagpur	<a href="http://www.kvknagpur.org.in">http://www.kvknagpur.org.in</a>
	Krishi Vigyan Kendra Nandurbar	<a href="http://kvknandurbar.net">http://kvknandurbar.net</a>
	Krishi Vigyan Kendra Nashik	<a href="http://www.kvknashik.com">http://www.kvknashik.com</a>
	Krishi Vigyan Kendra Baramati	<a href="http://www.kvkbaramati.com">http://www.kvkbaramati.com</a>
	Krishi Vigyan Kendra Satara	<a href="http://kvkarad.org">http://kvkarad.org</a>
	Krishi Vigyan Kendra Sindhudurg	<a href="http://www.kvksindhudurg.com">http://www.kvksindhudurg.com</a>
	Krishi Vigyan Kendra Solapur	<a href="http://www.kvksolapur.org">http://www.kvksolapur.org</a>
	Krishi Vigyan Kendra Thane	<a href="http://www.kvkthane.com">http://www.kvkthane.com</a>
	Krishi Vigyan Kendra Wardha	<a href="http://www.kvkwardhapdkv.org">http://www.kvkwardhapdkv.org</a>
	Krishi Vigyan Kendra Washim	<a href="http://www.kvkwashim.com">http://www.kvkwashim.com</a>
	Krishi Vigyan Kendra Yavatmal	<a href="http://www.kvkyavatmalpdkv.org">http://www.kvkyavatmalpdkv.org</a>
	KVK Dr Panjabrao Deshmukh Krushi Vidyapeth Akola	<a href="http://www.pdkv.ac.in/ExtensionKvk.php">http://www.pdkv.ac.in/ExtensionKvk.php</a>

	Krishi Vigyan Kendra Durgapur Amaravati	<a href="http://kvkdurgapur.org">http://kvkdurgapur.org</a>
	Krishi Vigyan Kendra Dhule	<a href="http://kvkdhule.freeservers.com">http://kvkdhule.freeservers.com</a>
	Krishi Vigyan Kendra Latur	<a href="http://kvklatur.com">http://kvklatur.com</a>

### III. e-District – Agricultural related Services

e-District is one of the 27 Mission Mode Projects under National e-Governance Plan (NeGP) with the DeitY, GoI being the nodal Ministry. This project aims at providing support to the basic administrative unit, i.e. “District Administration” by undertaking backend computerization to enable electronic delivery of high volume citizen centric services which would optimally leverage and utilize the three infrastructure pillars of State Wide Area Networks (SWAN), State Data Centers (SDC) and Common Service Centers to deliver services to the citizen at his doorsteps.

e-District pilot projects have been initiated in 41 districts across 16 states. It is now proposed to rollout the e-District MMP to cover all the districts in the country<sup>3</sup>. In some state Agricultural related services have been undertaken. NeGP-AMMP will integrate with agricultural related services covered under e-District project. The details of Agricultural related services undertaken under this project have been given below-

#### i. e-District - Haryana State

Haryana State is implementing following services in Agricultural sector under e-District Project.

- ◆ License Issuance System for Seed/Fertilizer/Pesticide
- ◆ Renewal of licenses of seeds, pesticides and fertilizers
- ◆ Issuance of Animal Insurance

#### ii. e-District - Kerala State

Kerala State is implementing following services in Agricultural sector under e-District<sup>4</sup> Project-

- ◆ Soil Testing
- ◆ Crop Insurance

<sup>3</sup> Saaransh - A compendium of Mission Mode Projects under NeGP by Department of Electronics and Information Technology, Ministry of Communications and Information Technology, Government of India

<sup>4</sup> [http://www.info.edistrict.kerala.gov.in/index.php?option=com\\_content&view=article&id=65&Itemid=65](http://www.info.edistrict.kerala.gov.in/index.php?option=com_content&view=article&id=65&Itemid=65)

- ◆ Indemnity of Crop Insurance

### **iii. e-District - Maharashtra State**

- ◆ Grant of Instruments/Seeds/Chemicals
- ◆ National Biogas development scheme

### **iv. e-District - Punjab State**

- ◆ Issuance and renewal of License for sale of seeds / fertilizers / insecticides
- ◆ Issuance of duplicate Agriculture License
- ◆ License Status tracking and Monitoring

### **v. e-District – Tamilnadu State**

- ◆ Grievance redressal of farmers

## **IV. List of ICT projects in various NARS (National Agricultural Research System) Institutions as well as SASAs**

(Source: National Statistical Commission Sub-Group-V Report on “IT and IT use in Agricultural statistics, Agro-Climatic Regional planning and Small Area Farm Business”, April 2011)

<b>Serial No.</b>	<b>Organisation</b>	<b>Initiatives and Points of discussion</b>
1.	Sugarcane Breeding Institute, Coimbatore	<p><b>1. Decision Support</b> System on Sugarcane Pests</p> <p><b>2. Database :</b></p> <ul style="list-style-type: none"> <li>• Sugarcane Statistics from secondary sources;</li> <li>• Sugarcane Crop Genetic Resources;</li> </ul> <p><b>3. New Initiative:</b></p> <ul style="list-style-type: none"> <li>• To collect farm level data for developing precision farming system</li> <li>• To identify Disease prevalence in selected locations using GIS in collaboration with NRSA, Hyderabad.</li> </ul>
2.	NRC on Leech, Muzaffarpur, Bihar	1. <b>Resource Inventorisation</b> being undertaken by State Statistical Agencies, is expected to utilize Remote Sensing Technology and GIS

		<p>technology so as to exhibit accuracy; As the crops will stand for longer period, it should not be difficult;</p> <ol style="list-style-type: none"> <li>2. <b>Resources Inventorisation :</b> Crops, Animals, Fisheries, water resources, Soil resources, vegetation resources, environmental conditions etc are essential;</li> <li>3. For Perennial Crops / Commercial, Area Coverage has to be accurate; Under RKVY, NHM schemes etc, new Area Coverage to be included in the Area Statistics;</li> <li>4. For seasonal crops, <b><u>accurate data is required</u></b>; If it is not collected properly, possible consequences are to be recognised;</li> <li>5. Farmer Advisory System for <b><u>each crop</u></b> is essential;</li> <li>6. Commercial crops such as : mango, Citrus, Amla etc need to have a strong supply-chain for marketing;</li> </ol>
3.	Directorate of Medicinal and Aromatic Plants Research, Boriavi (Gujarat)& Dr. Srinivasa Road,	<ol style="list-style-type: none"> <li>1. No meaningful database is available for undertaking research;</li> <li>2. Guestimate : Backward calculation based on Market arrivals of medicinal and aromatic commodities / varieties;</li> <li>3. There are about 40 – 100 varieties being marketed;</li> <li>4. FAO Database is mainly for food crops &amp; commercial crops;</li> <li>5. Area sown and crop production from Panchayat level – <b><u>2.65 Lakh Panchayat level input</u></b> will be of great help;</li> <li>6. NARS System (300 Agri Colleges, 49 SAUS, 95 ICAR institution, 2500 Research stations of NARS to validate through GPS tools;</li> <li>7. Enriching AGMARKNET portal w.r.t medicinal and aromatic plants;</li> <li>8. GAPs and Technology transfer to farmers – Enriching NeGP-AMMP;</li> </ol>

		<p>9. Agroclimatic regional database is not updated;</p> <p>10. <b><u>Agro-ecological maps</u></b> at panchayat level are needed; <b>Upto district level</b>, now available;</p>
4.	Directorate of Mushroom Research, Chambaghat, Solan (HP)	<p>1. Expert System on mushroom cultivation technology for farmers and entrepreneurs to facilitate better decision making (on-going); Being undertaken in collaboration with IASRI, New Delhi.</p>
5.	Central Rice Research Institute, Cuttack	<p>1. Rice Knowledge Management System</p> <p>2. APY Data upto District level updated upto 2006-07</p> <p>3. Rice QTL database</p>
6.	Central Tobacco Research Institute (ICAR), Rajahmundry, Andhra Pradesh	<p>1. <b>Information System - FCV Tobacco</b> Production and Marketing Trends in India</p> <p>2. <b>Database</b> - Meteorological Database Management System on Weather Parameters</p> <ul style="list-style-type: none"> <li>• Air Temperature (Min, max)</li> <li>• Soil temperature (Min, Max)</li> <li>• Relative Humidity (Min, Max)</li> <li>• Rainfall (Total rainfall/day, # Rainy Days per month)</li> <li>• Sun Shine Hours</li> <li>• Wind Velocity</li> <li>• Vapour Pressure</li> </ul> <p>Since 1960 data is being updated every fortnight;</p> <p>3. Decision Support System - <b>Soil Fertility Evaluation and Fertiliser Recommendations</b> to FCV Tobacco Crop</p> <ul style="list-style-type: none"> <li>• <u>Provides NPK fertiliser recommendation</u> for light and heavy soils separately;</li> <li>• <u>Possible to identify</u> soil texture (soil type)</li> <li>• <u>Grouping the villages</u> having similar soil characteristics including texture for drawing rational and balanced fertiliser recommendations for Flue-cured Tobacco in</li> </ul>

		different soil types;
7.	Central Research Institute for Dryland Agriculture (CRIDA) ICAR, Hyderabad	<p>1. <b>DSS</b> on Sorghum and Weather based crop management.</p> <p>2. <b>Agromet Databank:</b> It is a large Weather and Crop database. (Ongoing);</p> <p>3. <b>Crop Weather Outlook:</b> Information on agro advisories. (Ongoing);</p> <p>4. <b>Development of agricultural statistics database of rainfed districts:</b> (viz., net sown area, net irrigated area, source-wise net irrigated area, area sown and production of major rainfed crops, fund allocated under NREGS, credit flow to agriculture, consumption of nitrogen, phosphate and potash fertilizers, number of markets, composition of livestock etc.)</p> <p>5. <b>Expert system for Castor yield prediction:</b> It is an expert system developed for estimation of crop yields of castor in Telengana region of Andhra Pradesh.</p> <p>6. <b><u>AgroWeb project:</u></b></p> <ul style="list-style-type: none"> <li>• Development of a database on land use, rainfall, and crops for rainfed districts under AgroWeb project: A database under development.</li> <li>• Development of research project information system for AICRP on dryland agriculture</li> </ul> <p>7. <b>Decision Support System (DSS)</b> for pests of rice and cotton based cropping systems (in pipeline);</p> <p>8. <b>Tank silt calculator:</b> MS-excel based macro. It is used for determining the quantity of tank silt to be recycled to farm field. Textural properties of tank silt and field soil are to be given as inputs. This will enable balanced application of tank silt in the field.</p> <p>9. Knowledge Share Center: Knowledge Share Center (KSC) at grass roots level provide</p>

		<p>access to value added information services on latest tools and technologies of agriculture for improving the rural livelihoods. The custom tailored services include:</p> <ul style="list-style-type: none"> <li>• information and knowledge dissemination of package of practices,</li> <li>• crop diagnostic services,</li> <li>• plant protection measures,</li> <li>• dynamic market information,</li> <li>• weather advisory services</li> </ul> <p>It is implemented in CRIDA's NAIP project on <b>"Sustainable rural livelihoods through enhanced farming systems productivity and efficient support systems in rainfed areas"</b> which is an action research pilot project being implemented in selected village clusters of the 8 backward districts of Andhra Pradesh.</p> <p>10. Information through <b>Touch screen kiosks</b>, queries addressal system through <b>IVRS</b>, and Display announcement system, Internet, <b>Sasyavani</b> and mobile based SMS are the essential features of the KSC.</p>
8.	Central Plantation Crops Research Institute (CPCRI), ICAR, Kasaragod. <a href="http://www.cpcri.gov.in">http://www.cpcri.gov.in</a>	<p><b>1. INARIS project:</b> Plantation crops Data Mart: Statistics, Agrotechniques and Research (coconut, Areca nut, cocoa);</p> <p><b>2. Technology dissemination – CD-ROM based E-manual on :</b></p> <ul style="list-style-type: none"> <li>• Coconut cultivation,</li> <li>• Cocoa cultivation</li> <li>• Areca nut cultivation;</li> <li>• Integrated Pest management</li> <li>• Integrated Diseases management;</li> <li>• Coconut Descriptor;</li> </ul> <p><b>3. Database:</b></p> <ul style="list-style-type: none"> <li>• Palm Database</li> </ul>

		<ul style="list-style-type: none"> <li>• Cropgene Database</li> <li>• Stress Gene Database</li> <li>• Coconut Microsatellite Database</li> <li>• Phytoplasma Database</li> <li>• MEMCO</li> <li>• Vegetable Oil Database</li> <li>• Microbial Information Systems on Plantation Crops [MIFSPC]</li> <li>• Coconut Disease Database</li> <li>• Coconut cultivar Identification</li> <li>• CORPK Database</li> <li>• Coconut Germplasm Database</li> <li>• Arecanut Germplasm Database</li> <li>• Cocoa Germplasm Database</li> <li>• Bibliographic Literature Database</li> </ul> <p><b>4. Analytical Tools:</b></p> <ul style="list-style-type: none"> <li>• Motion Analysis of Insect</li> <li>• Statistical tools for analysis of plantation crops experimental data;</li> </ul>
9.	<b>Tobacco Board, Guntur</b>	<p><b>1. Database :</b></p> <ul style="list-style-type: none"> <li>• Crop Production Regulation - Registration of the growers, barn operators and commercial nurserymen;</li> <li>• On Issue of RCMCs</li> <li>• Export statistics viz., exporter wise, variety wise, country wise and continent wise for tobacco and tobacco products separately; Data from the Form-34 and Form-18;</li> </ul> <p><b>2. Supply-Chain Model for Tobacco Growers : inputs supply, Credit / input loans,</b></p>
10.	National institute of Animal Nutrition and Physiology, ICAR,Bangalore	<p><b>1. Data base</b> on availability of feed resources and feed requirement (District wise) for the entire country;</p> <p><b>2. Information system</b>-Feed portal on Indian</p>

		<p>feed resources (being developed) presently we are accessing information from published (hard copy/ soft copy) and generally there is a time lag between information generation publishing the information. If we are allowed to access the district data through NIC this will substantially reduce the time gap and increase the speed of updation.</p> <p><b>3. Expert System (Under Development):</b> A web based expert system for computation of balanced ration for dairy animals, facilitating farmers to compute ration for his animal(s) using available resources at the household.</p> <p><b>4. Knowledge Management System (Under Development)</b> to cater to all the stakeholders.</p>
11.	<b>Central Marine Fisheries Research Institute (CMFRI), Kochi</b>	<p><b>1. Database :</b></p> <ul style="list-style-type: none"> <li>• National Marine Living Resources Data Centre;</li> <li>• NMDRS (National Marine Living Resources Data Retrieval System)</li> <li>• Biobase</li> <li>• Market database - Landing centre price</li> <li>• Ecosystem based modeling data repository</li> <li>• Marine Biodiversity-Taxonomic Ready Reckoner</li> <li>• Fishery Environment Indicators database</li> </ul> <p><b>2. DSS (Pipeline)</b></p> <ul style="list-style-type: none"> <li>• Georeferenced- Marine Resource Capture Knowledge Management System</li> <li>• DSS for Fish Stock Assessment (Frequentist &amp; Bayesian)</li> </ul>
12.	<b>National Agricultural Innovation Project (NAIP), ICAR</b> <a href="http://www.naip.icar.org.in/downloads/Summary/C1_DIPA_">http://www.naip.icar.org.in/downloads/Summary/C1_DIPA_</a>	<p><b>1. Strengthening of agricultural communication in the country</b></p> <ul style="list-style-type: none"> <li>• Dissemination of Innovative Technologies in Print Media</li> <li>• Video Films on Success Stories of</li> </ul>

	Mobilizing.pdf)	<p>Agricultural Technologies and Innovation of farmers</p> <ul style="list-style-type: none"> <li>• Audio Capsules on Agriculture Technologies</li> </ul> <ol style="list-style-type: none"> <li>2. Creation of an interactive and multi-layered communication system crossing economic, gender, language and social barriers.</li> <li>3. To build up and harness synergy of inter-institutional communication platform in participatory mode.</li> <li>4. Capacity building for agricultural communication in different modes and media.</li> </ol>
13.	<b>Indian institute of Vegetable Research, (ICAR), Varnasi</b>	<p>At present there is limited information with regard to use of IT and ICT in case of vegetables. However, following activities are in progress at IIVR in bioinformatics and database development.</p> <ol style="list-style-type: none"> <li>1. <b>Internet Use:</b> Nucleotide sequences that comprise huge data available in public domain, <u>to study</u> the recombination events/hotspots in the different strains of begomo viruses infecting tomato and causing a severe leaf curl disease, <u>under the Research project</u> entitled “<i>In silico</i> analysis and detection of recombination hotspots in begomoviruses infecting tomato in South and South East Asia” ;</li> <li>2. <b>Extensive use of Open Source Softwares</b> viz., Recombination Detection Program (RDP), CLUSTAL W, Splits-Tree, GENECONV, MAXIMUM CHI SQUARE, TreeOrder, Simmonics2005;</li> <li>3. The Software CLUSTAL W, and applications like BLAST were used to derive meaningful conclusions from the Data (the partial sequence of coat protein (AV1) and replicase enhancer protein gene (AC3) of pepper leaf curl virus was identified, cloned and sequenced). The</li> </ol>

	<p>sequence has been submitted to <b>NCBI GenBank</b> database;</p> <p>4. <b><u>CD-ROM</u></b> : for dissemination of IPM technology for Brinjal shoot and fruit borer management, under the DFID project titled “Development of an integrated pest management strategy for eggplant fruit and shoot borer in South Asia”;</p> <p>5. <b>Mass Media Support:</b> Under the NAIP project “Mobilizing Mass Media Support for Sharing Agro-information”,</p> <p>6. <b>Potential areas for ICT Applications:</b></p> <ul style="list-style-type: none"> <li>a. <b>Crop Simulation Models</b> for studying crop responses to water and nutrient management practices, yield forecasting, assessment of climate change impacts on crop yields, studying insect pest and disease infestation in relation to weather parameters for development of pest and disease forewarning systems;</li> <li>b. <b>Remote Sensing and GIS applications</b> for land and climatic suitability analyses, crop acreage and yield estimation, genetic diversity mapping, crop condition assessment, precision farming and management of soil and water resources;</li> <li>c. <b>Decision Support Systems/Expert Systems/ Information systems (Web based or Standalone mode)</b> for pest and diseases, water and nutrient management;</li> <li>d. <b>Database development</b> in the field of bioinformatics, germplasm management;</li> <li>e. Use of bioinformatics tools for identification and mapping of genes/QTLs, structural/ functional analysis of genome, transcript analysis,</li> </ul>
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		<p>and identification of single nucleotide polymorphisms;</p> <p>f. <b>Use of ICT</b> in transfer of technology/extension activities, research monitoring and planning;</p>
14.	All India Coordinated Research Project on <b>Sesame</b> and <b>Niger</b> , JNKVV, Jabalpur	<p><b>1. Database on</b></p> <ul style="list-style-type: none"> <li>• Varietal information</li> <li>• Production technologies for different states.</li> <li>• Insect pests and diseases.</li> <li>• APY Statistics</li> </ul>
15.	<b>VPKAS, ICAR</b> ( <a href="http://vpkas.nic.in/relvars.htm">http://vpkas.nic.in/relvars.htm</a> )	<ol style="list-style-type: none"> <li>1. Database on released varieties (including information area of adoption, altitude, grain, maturity, resistant to disease and potential yield). It helps in the selection of varieties for specific location and condition.</li> <li>2. <b>e-Book - Uttar paschimi parvatiya kshetron mein krishi-utpadakta ki vriddhi ke liye unnat takniken</b> (<i>Hindi version</i>). The e-book contains information for North-Western Himalayan region on high yielding, varieties, production technology, cropping system, high yielding vegetable technology, water management, protected cultivation, fodder production, pest management, farm implements and others general information. It is also available on the institute website (<a href="http://vpkas.nic.in/e_tech.pdf">http://vpkas.nic.in/e_tech.pdf</a>)</li> <li>3. <b>e-Book - Uttar paschimi parvatiya kshetron mein parmukh sabjion ki unnat kheti</b> (<i>Hindi version</i>). This e-book contains the information for North-Western Himalayan region on commonly grown vegetables, like pea, french bean, tomato, capsicum, okra, onion, garlic, cabbage, potato, pumpkin, off season vegetable in polyhouse, mushroom production technology, baby corn production technology</li> </ol>

		<p>and vegetable seed production etc.</p> <p>4. e-Book- DUS (Distinctness, Uniformity &amp; Stability) Characterization of Indian Soybean Varieties. This e-book provides the following information: Passport and distinguishing characters of each soybean variety, Key for identification of each notified soybean variety, grouping of soybean varieties on the basis of essential DUS characters. This e-book is intended to help the user for the selection of most similar soybean varieties for the DUS trials.</p> <p>5. ICT enabled “<i>Krishk Help Line</i>” - toll free no 18001802311;</p>
16.	<b>National Centre for IPM, ICAR, Pusa, New Delhi</b>	<p>1. <b>Information systems/ database/ decision supports systems :-</b></p> <ul style="list-style-type: none"> <li>• Pest Management Information System (PMIS) for Cotton, Basmati Rice, Chickpea, Mustard, Groundnut, Okra &amp; Brinjal ;</li> <li>• <b>Pesticide Advisor:</b> A decision support tool for judicious use of pesticides in pest management</li> <li>• Crop-pest database consisting of information about 65 crops;</li> <li>• On-line pest ,monitoring and advisory system for Bt Cotton;</li> <li>• e-Pest surveillance &amp; advisory system for Cotton-Soybean based cropping system in Maharashtra;</li> <li>• GIS based automated mapping of pest of major crops</li> <li>• e-pest surveillance system for Rice crop in Orissa;</li> <li>• National e-pest surveillance and alert system for pulses;</li> <li>• National Information System for Pest Management in Bt Cotton;</li> </ul>

		<ul style="list-style-type: none"> <li>• Online database of IPM package of practices for different crops;</li> <li>• Online database of pest resistance in India;</li> <li>• Online bio-pesticides database;</li> </ul>
17.	<b>Directorate of Oil Palm Research, ICAR, Pedavegi</b>	<p><b>1. Oil Palm Experimental Plot Information System:</b> This software incorporates the details of all the palms planted for the purpose of experiments that are carried out in the institute / research centres. The data of each palm for the entire life can be maintained using this software.</p> <p><b>2. Oil Palm Seed Garden Information System:</b> This software incorporates the manual methods followed in calculating and analyzing the data to help in the process of decision-making. The data on the entire life of the palms in the seed garden can be maintained along with the details of hybridization and seed germination. The data on performance of the palms aids in making technically good decisions.</p> <p><b>3. Oil Palm Germplasm Information System:</b> This software acts as a repository of information on oil palm germplasm. A vast number of parameters are incorporated in this software based on the oil palm descriptors formulated by International Plant Genetic Resources Institute and adopted by Food and Agricultural Organisation.</p> <p><b>4. Oil Palm Processing Mill Information System:</b> This software enables the user to store the data regarding the various processing facilities, products and byproducts available in the oil palm processing mills.</p> <p><b>5. Oil Palm Clinic:</b> This software records the various aspects on oil palm cultivation like management practices, harvesting details, pest and disease information, price of Fresh Fruit</p>

		<p>Bunches etc. which helps in calculating the economics of oil palm cultivation and become vigilant against pests and diseases in future years.</p> <p><b>6. Oil Palm Pest Information System:</b> This software is an information system on the pests of oil palm, the congenial conditions for their attack on oil palm, symptoms of damage and management practices to be adopted for rectification can be known.</p> <p><b>7. Oil Palm Harvesting and Processing Information System:</b> This software imparts information on various post harvest techniques in oil palm like harvesting of Fresh Fruit Bunches, grading, milling, waste utilization and value addition aspects.</p> <p><b>8. E-manual on Oil Palm Cultivation:</b> Oil palm cultivation practices from planting to harvesting, maintenance of the plantations etc. are narrated along with relevant photos in this software for creating awareness in oil palm community.</p> <p><b>9. Digital Photo Library:</b> Digital photographs relevant to oil palm cultivation viz., sprouts, nursery, planting, intercrops, irrigation and fertilizer application, pest and disease symptoms, harvesting etc. are given in a sequential manner for giving first hand information to the viewers.</p> <p>10. (Under development) :Database on oil palm plantations;</p> <p>11. (Under development) Creating a web interactive software for queries on oil palm cultivation</p> <p>12. (Under development) Development of Software for Irrigation and Fertilizer Experiment in the Institute</p>
18.	<b>Central Institute of Brackish</b>	<b>1. Intranet Application for Research Publication</b>

	<b>Water Aquaculture (CIBA), ICAR, Chennai</b>	<p>Management</p> <p>2. Aquaculture Database System –Ver 1.0 for analyzing the farming practices of Brackishwater;</p> <p>3. <b>e-Learning Material:</b></p> <ul style="list-style-type: none"> <li>• Hand book of fisheries information</li> <li>• Mud Crab Fattening (in Tamil and Telugu)</li> <li>• Soil and water management in Brackishwater shrimp aquaculture</li> </ul> <p>4. <b>Database Management / Information System</b></p> <ul style="list-style-type: none"> <li>• Brackishwater species</li> <li>• Shrimp Production statistics</li> <li>• Aquaculture Diseases</li> <li>• National Policies</li> </ul> <p>5. <b>Multi Criteria Decision Making model:</b> TOPSIS-AHP based model for prioritizing the aqua-sites for aquaculture farming development;</p> <p>6. <b>Decision Support System:</b> carrying capacity of water body for shrimp farming Ver 1.0</p>
19.	<b>NRC for Grapes, Pune</b>	<p>1. Grape Germplasm Information System;</p> <p>2. NRCG-SKAI PMEXPERT, Software for management of powdery mildew in Indian vineyards;</p> <p>3. Information System for molecular data generated by microsatellite markers;</p>
20.	<b>Central Potato Research Institute, Shimla</b>	<p>1. <b>Information Systems/Data Bases1.</b></p> <ul style="list-style-type: none"> <li>• <b>Potato crop profile</b> covering different aspects on production, post harvest management and socio-economic status.</li> <li>• <b>Information bank (Potato-E-Book):</b> an electronic book on agro-techniques for potato production gives the information on the package of practices of potato in a simple language; well illustrated with</li> </ul>

	<p>photographs.</p> <ul style="list-style-type: none"> <li>• <b><u>Technology bank</u></b> on the technology developed for potato production and post harvest management</li> <li>• IPR profile covering IP portfolio and technology management status of CPRI.</li> </ul> <ol style="list-style-type: none"> <li>2. <b>GIS</b> : Maps prepared through GIS (Spatial Database) on different aspects of potato production and natural resources relevant to potato in different parts of the country.</li> <li>3. <b>Photo library</b>: Digitized photographic database of potato on all the aspects of Potato Research and Development.</li> <li>4. <b>All India Coordinated Research Project</b> (Potato) database.</li> <li>5. <b>Decision Support Systems :</b> <ul style="list-style-type: none"> <li>• Crop Scheduling (Computer Aided Advisory System for Potato crop Scheduling) which gives the estimated yield potential of 10 varieties for 5 simulated dates of planting in about 1500 places in India;</li> <li>• <b><u>Pest and Disease management</u></b> (Potato Pest Manager) which identifies the pest or disease problem, gives the preventive measures and also the recommendations for control, tailored to the user's situation;</li> <li>• <b><u>Fertilizer recommendations</u></b> (Advisory System for Nitrogen Management in Potato): A unique decision support tool Advisory System for Nitrogen Management in Potato was developed which gives the N dose to be applied for any target yield, dry matter content, harvest index, soil test values and with and without FYM application.</li> <li>• Potato Late Blight management (is being used for forecasting for WUP).</li> </ul> </li> <li>6. <b>Spatial Studies to help policy decisions (RS</b></li> </ol>
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		<p><b>&amp; GIS and Crop Modeling).</b></p> <ul style="list-style-type: none"> <li>• Develop methodologies for forecasting potato acreage and yield at national level (Operationalised and implemented under FASAL programme of GOI).</li> </ul> <p><b>7. Weed management (under development).</b></p>
21.	AICRP on Honey Bees & Pollinators (ICAR), CCS HAU, Hisar - 125004	<ol style="list-style-type: none"> <li>1. No Information Systems, databases, decision support systems etc., for producers/retailers</li> </ol>
22.	<b>Anand Agricultural University, Anan</b>	<ol style="list-style-type: none"> <li>2. <b>Decision Support System - e-Krishi Kiran (AGRISNET Project)</b> <ul style="list-style-type: none"> <li>• Direct advice to individual farmer - a new approach in extension at village, Taluka, district and state level offices;</li> <li>• <b>Soil Health Card :</b> <ol style="list-style-type: none"> <li>a. The soil analysis of 18, 21, 848 individual farmers has been made and its results are stored in the database. On that basis SHC has been generated and given to the farmers.</li> </ol> </li> <li>• <b>Village Soil Health Card</b> <ol style="list-style-type: none"> <li>a. The card based on average soil test values of the village fields are generated for 18,600 villages of the state, which is useful for farmers who's fields are not analysed.</li> </ol> </li> <li>• <b>Crop Planning / Recommendation</b> <ol style="list-style-type: none"> <li>a. Made on the established scientific approach taking into consideration of talukwise soil moisture index, crop growing period and runoff and its utilization which is useful for the all farmers of the state.</li> </ol> </li> <li>• <b>Package of practices for all the crops</b> <ol style="list-style-type: none"> <li>a. <b>Agro climatic zone</b> wise detailed crop practices given for existing crop and possible alternative crops.</li> </ol> </li> </ul> </li> </ol>

		<ul style="list-style-type: none"> <li>• <b>Research Recommendations for the Farmers</b> <ul style="list-style-type: none"> <li>a. Research Recommendations based on the research experiments conducted by university over the year are compiled and made available with scientist address.</li> </ul> </li> <li>• <b>Model Action Plan</b> <ul style="list-style-type: none"> <li>a. Taluka Action Plan</li> <li>b. Village Action Plan</li> </ul> <p>It is a year wise action plan for each Taluka and village extension officials with complete agricultural database.</p> </li> </ul> <p><b>Frequently Asked Question</b></p> <ul style="list-style-type: none"> <li>• <b>Queries and Solutions</b> - With help of online query form farmer can send his queries and get solutions.</li> <li>• <b>Recommendation for fertilizer usages for each farm, based on <u>soil analysis</u></b> <ul style="list-style-type: none"> <li>a. Suggest <u>alternate cropping pattern</u> based on moisture availability index.</li> <li>b. Provide <u>Soil Health Card</u> to each farmer to guide him about his soil conditions and cropping practices to be followed.</li> </ul> </li> </ul>
23.	<p>Directorate of Economics &amp; Statistics, Assam  <a href="http://www.ecostateassam.nic.in">http://www.ecostateassam.nic.in</a></p>	<p><b>1. Use of ICT in Agricultural Statistics</b></p> <ul style="list-style-type: none"> <li>• A project named '<u>Micro Fiscal Project</u>' at the initiative of the Finance Department; Govt. of Assam to be funded by ADB is being initiated for quick processing and easy retrieval of Agricultural data.</li> <li>• There is a proposal to link the District and Sub-divisional offices of the Directorate including the Block Offices with the Directorate head quarter under this project for quick retrieval of different statistics under various sectors of the economy.</li> </ul> <p><b>2. Not in Database Form:</b> The data on <u>thirty</u></p>

		<p><b>eight crops</b> are available at Sub-divisional /District and State level for different uses. Different Agricultural Statistics pertaining to the State is available in the departmental Web site <a href="http://www.ecostateassam.nic.in">http://www.ecostateassam.nic.in</a></p>
24.	<b>Central Institute Sub-Tropical Horticulture (CISH), Lucknow</b>	<p><b>1. Information system</b></p> <ul style="list-style-type: none"> <li>• CISH technologies and farmers' advisory through CISH website;</li> <li>• Mango, Climatic parameters associated with off-season flowering in mango;</li> </ul> <p><b>2. Database</b></p> <ul style="list-style-type: none"> <li>• Genetic Resources databases</li> </ul> <p><b>3. Decision support system</b> for mango</p>
25.	<b>NRC on Citrus, Nagpur</b>	<p><b>1. Information System</b></p> <ul style="list-style-type: none"> <li>• Development of network based web component resource information system including improvement, production, protection, post-harvest management and value addition.</li> </ul>
26.	<b>NRC on Banana, Trichy</b>	<p><b>1. Database</b></p> <ul style="list-style-type: none"> <li>• <i>Musa</i> Germplasm Information System (MGIS) containing detailed and standardized information on various <i>Musa</i> accessions stored in different <i>Musa</i> gene banks around the world.</li> </ul>
27.	<b>NRC for Pomegranate, Solapur:</b>	<p><b>1. Decision Support System (DSS):</b></p> <ul style="list-style-type: none"> <li>• Weather based Crop Insurance System</li> <li>• Weather based Disease Forecasting System</li> </ul>
28.	<b>Directorate of Cashew Research, Puttur</b>	<p><b>1. Knowledge Based System</b> for IPM of Cashew Stem and Root Borers (CSRB), ,</p> <p><b>2. DSS:</b> A Nutrient Decision Support System for Rainfed Cashew,</p> <p><b>3. Cashew CD Packages.</b></p>

		4. <b>Database:</b> Cashew Germplasm Database
29.	<b>Central Agricultural Research Institute, Port Blair</b>	<p>1. <b>Database:</b></p> <ul style="list-style-type: none"> <li>• Potato crop profile, Technology bank,</li> <li>• IPR profile,</li> </ul> <p>2. <b>GIS:</b> Spatial Database</p>
30.	<b>NRC for Orchids, Sikkim</b>	<p>1. <b>Database :</b></p> <ul style="list-style-type: none"> <li>• Germplasm and information on plant growth and flowering habit</li> <li>• compilation and analysis of various growth habit data,</li> <li>• Day-to-day weather reports through data logger.</li> </ul>
31.	<b>Indian Institute of Spices Research, Kozhikode</b>	<p>1. <b>Database:</b></p> <ul style="list-style-type: none"> <li>• Germplasm</li> <li>• <i>PhyDisH</i> (<i>Phytophthora</i> Diseases of Horticulture Crops)</li> </ul>
32.	<b>Project Directorate on Foot-and-Mouth Disease</b>	<p>2. Constraints in developing GIS for strengthening epidemiology of animal diseases</p> <ul style="list-style-type: none"> <li>• Whatever GIS maps are available; these are down to District level, not below. This becomes handicap in mapping animal diseases accurately.</li> <li>• One district might have more than ten villages, and <b>a particular disease might occur in one or two villages</b>, therefore it will be more appropriate and accurate to map the diseases at village or Block level, instead the entire district.</li> <li>• Therefore, if a GIS map of India is constructed down to village or Block level, <b>it will help in accurate surveillance and mapping of animal diseases</b> that will be useful in exact planning of disease control.</li> <li>• It is needless to mention that about 60% of human diseases are zoonotic; from animal to human.</li> </ul>

## Annexure – B Context Diagram



## I. External Entities that will interact with Central Agricultural portal for Information contribution and consumption

### i. Central Government Ministries & Departments

1. Ministry of Agriculture
  - a. Department of Agriculture & Cooperation (DAC)
    - i. DAC Headquarters and attached offices, Public Sector Undertakings, Autonomous Organisations as given in organisation structure in Annexure – D.
  - b. Department of Agricultural Research and Education (DARE)
    - i. Indian Council of Agricultural Research (ICAR)
    - ii. ICAR Institutions(45), Deemed Universities(4), National Research Centres(17), National Bureaux(6) & Directorate/Project Directorates(25) as given in organisation structure in Annexure – D.
    - iii. Central Agricultural University (CAU), Imphal
  - c. Department of Animal Husbandry, Dairying and Fisheries (DADF)
    - i. Animal Husbandry Division – Central Cattle Breeding Farms (CCBF), Central Frozen Semen Production and Training (CFSPT), Central Herd Registration Unit, Regional Stations, Central Fodder Seed Production Unit, Animal Quarantine & Certification Service Stations, Central Poultry Development Organisations and other institutes as given in Organisation Structure in Annexure - D
    - ii. Dairy Development Division – Delhi Milk Scheme
    - iii. Fisheries Division - Institutes as given in Organisation structure in Annexure - D
2. Ministry of Chemical and fertilizers
  - a. Department of Fertilizers
3. Ministry of Food and Civil Supplies
  - a. Department of consumer affairs
    - i. Bureau of Indian Standards
  - b. Department of food and public distribution
    - i. Warehousing Development and Regulatory Authority (WDRA)
4. Ministry of Water Resources
  - a. Central Water Commission (CWC) and State Regional Office of Suptd. Engineer (Hydrology Observation Circle) SE (Monitoring)
  - b. Central Ground Water Board (CGWB)
5. Ministry of Rural Development
  - a. Department of Rural development and Poverty Alleviation
  - b. Department of Land Resources
  - c. National Rainfed Area Authority (NRAA)
  - d. Council for Advancement of People's Action and Rural Technology (CAPART)
6. Ministry of Commerce and Industry

- a. Directorate General of Foreign Trade
  - b. Export Inspection Council
  - c. Marine Products Export Development Authority (MPEDA)
  - d. Agricultural and Processed Food Products Export Development Authority (APEDA)
  - e. Directorate General of Commercial Intelligence and Statistics (DGCIS)
  - f. Commodity Boards
    - i. Coffee Board
    - ii. Rubber Board
    - iii. Tea Board
    - iv. Tobacco Board
    - v. Spices Board
  - g. Export Inspection Council
  - h. Export Promotion Councils (EPCs)
7. Ministry of Environment & Forest
- a. Central Arid Zone Research Institute (CAZRI)
  - b. Institute for Ocean Management (IOM)
8. Ministry of Home (for Disaster Management)
- a. Department of Home (Disaster Management Division)
9. Planning Commission
- a. Unique Identification Authority of India (UIDAI)
10. Ministry of Finance
- a. Department of Revenue
  - b. Banks Public Centre Units(PSU)
  - c. Centre for Agricultural Banking (CAB), RBI, Pune
  - d. National Bank for Agriculture and Rural Development (NABARD)
  - e. Insurance PSUs
  - f. Customs, Excise and Service Tax (CEST)
11. Ministry of Earth Sciences
- a. Indian Meteorological Department (IMD) Pune
  - b. National Centre for Medium Range Weather Forecasting (NCMRWF)
12. Department of Space
- a. Indian Space Research Organization (ISRO)
  - b. National Remote Sensing Centre (NRSC)
13. Ministry of Panchayati Raj Institutions
14. Ministry of Science & Technology
- a. Department of Bio-Technology (DBT)
    - i. National Agri-Food Biotechnology Institution (NABI)
    - ii. National Institute Of Plant Genome Research (NIPGR)
    - iii. National Institute of Animal Biotechnology (NIAB)
15. Ministry of Communications and Information Technology
- a. Department of Electronics and Information Technology(DeitY)
    - i. National informatics Centre (NIC)
    - ii. Standardisation Testing and Quality Certification (STQC)

- iii. Centre for Development of Advanced Computing (C-DAC)
- 16. Ministry of Food Processing Industries
  - i. Indian Institute of Crop Processing Technology (IICPT)
  - ii. Indian Grape Processing Board (IGPB)
- 17. Ministry of MSMEs
  - i. Agro and Rural industries division
  - ii. Coir Board
- 18. Ministry of Defence
  - a. DRDO
    - i. Institutions dealing Hill Agricultural Development
    - b. Military Farms

## **ii. State Government Ministries & Departments**

- 1. Department of Agriculture
  - i. State Agriculture Deptt./Extension
  - ii. State Agricultural Management & Extension Training Institute (SAMETI)
  - iii. State Agriculture Universities (SAUs) & State Agriculture Colleges
  - iv. Extension Education Institutes (EEIs)
  - v. Agriculture Technology Management Agency (ATMA)
  - vi. State Remote Sensing Applications Centers
  - vii. Krishi Vigyan Kendras (KVKs)
  - viii. Farmers Training Centre (FTCs)
- 2. Department of Soil Conservation
- 3. Department of Irrigation
- 4. Department of Revenue
- 5. Department of Public Health
- 6. Department of Horticulture
- 7. Department of Panchayati Raj & Rural Development (Panchayati Raj Institution like Zila Parishad, Panchayat Samiti, Gram Panchayat etc.)
- 8. Department of Fisheries
- 9. Department of Animal Husbandry & Veterinary
  - i. State Livestock Development Boards/Agencies
  - ii. State Veterinary and Animal Sciences University
  - iii. Colleges of Veterinary and Animal Sciences
  - iv. Livestock Farms (cattle, buffalo, goat, sheep, pig, camel etc)
  - v. Poultry and Duck farms
  - vi. Feed & Fodder farms, Regional feed Testing Laboratories
- 10. State Veterinary Hospitals including Central & Regional Disease Diagnostic Laboratories

11. State Agricultural Marketing Board & Agricultural Produce Marketing Committee(APMC)
12. Food and Civil Supply Departments
13. State Transport Authority
14. State Warehousing Corporation (SWC)
15. State level Banking Committees (SLBC)
16. District level Banking Committees (DLBC)
17. Directorate of Agricultural Engineering
18. Water Resource Department, Govt. of Jharkhand
19. Integrated Watershed Management Programme, State Level Nodal Agency, Dispur
20. Directorate of Fisheries and its subordinate offices
21. MATSYAFED, BENFISH
22. Fisheries Colleges/Universities
23. NIFAM - (National Institute of Fisheries Adm. & Management)
24. FFDA ( Fish Farmers Development Agency )
25. BFDA (Brackish Water Fish Farmers Development Agency)
26. HED (Harbour Engineering Department)
27. FIRMA – Fisheries Resource Management Society

### **iii. Other Institutes**

1. IIT
2. The Director of Research / Registrar, State Agricultural Universities
3. Directorate of Research, CSK Himachal Pradesh Krishi Vishva-Vidyalaya, Palampur-176062 (HP)
4. Secretary, I & PH, Government of HP, Shimla-2
5. National Dairy Development Board (NDDB)
6. National Bureau of Animal Genetic Resources (NBAGR), Karnal
7. National Institute of Animal Health, Baghpat, Uttar Pradesh
8. Forward Markets Commission(FMC)
9. Commission for Agricultural Costs & Prices(CACP)
10. Agro Industries Corporations
11. Food Corporation of India(FCI)
12. National Horticulture Board (NHB)
13. Indian institute of Soil Sciences
14. Central Institute of Agriculture Engineering, Bhopal, MP
15. Rural Development and Self Employment Training Institute (RUDSETI) Centres
16. Association of Agricultural Librarians and Documentalists of India (AALDI)
17. Agriculture Department of Public Sector Banks
18. Regional Rural Bank and Other Financial Institutions

19. Primary Agriculture Cooperative Societies
20. Coast Guard, MMD ( Ministry of Surface Transport)
21. INCOIS ( Indian National Centre for Ocean Information Services)
22. DGCI&S (Directorate General of Commercial Intelligence and Statistics ) (Kolkata),  
MPEDA,EIC
23. FSSAI (Food Safety and Standard Authority of India)
24. NRSA (National Remote Sensing Agency)
25. Commodity Boards Under Ministry of Commerce

**iv. International, Multilateral and Bilateral Institutions**

1. Food and Agriculture Organisation of United nations
2. World Bank
3. International Development Research Centre(IDRC)
4. Asian Development Bank (ADB)
5. South Asian Association for Regional Cooperation (SAARC)

**v. National Institutions – NGOs**

1. M. S. Swaminathan Research Foundation (MSSRF), Chennai
2. BAIF, Pune
3. ...

## Data Dictionary

### I. Common Data entities

For each master directory corresponding directories for local languages will be maintained.

#### I.1 Table Name: State

This master table contains the list of all States of India

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique Row Id
State_Code	Primary key		Char	2	State code will be same as GIS code if RGI codes 2011 adopted
State_Name			Varchar	50	State Name in English

#### I.2 Table Name: District

This master table contains the list of all districts in states of India.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique Row Id
State_Code	Primary key Foreign Key	State	Char	2	State Code
District_Code	Primary key		Char	3	District Code
District_Name			Varchar	50	District Name in English

### I.3 Table Name: Sub\_District

This master table contains the list of all Sub District regions. Nomenclature used for Sub District region may vary from States to States. Sub\_District\_Type field has been used for States to define locational Hierarchy followed by them.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique Row Id
State_Code	Primary key Foreign Key	State	Char	2	State Code
District_Code	Primary key	District	Char	3	District Code
Sub_District_Code	Primary key		Char	5	Sub District Code
Sub_District_Type			Varchar	15	Nomenclature of Sub-District used in the state: -Tahsil -Taluk -C.D. Blocks -Sub Division -Circle -R.D Blocks -Mandal -Police Station ( For the purpose of standardization, the above nomenclatures used by various states would mean Sub-District only)
Sub_District_Name_English			Varchar	50	District Name in English
Agro_Climatic_Zone_Code	Foreign key	Agro Climatic Zone	Char	10	Agro Climatic Zone Code

#### I.4 Table name : Village (Rural Land Region)

This master table contains the list of all villages.

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
State_Code	Primary key Foreign Key	State	Varchar	2	State Code
District_Code	Primary key Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Primary key Foreign Key	Sub_District	Varchar	5	Sub District Code
Village_Code	Primary key		Varchar	6	Village Code
Village_Name			Varchar	50	Village Name
Latitude			Float	6	Latitude
Longitude			Float	6	Longitude

#### I.5 Table name : Urban Land Region

This master table contains the details of Urban Land Region

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
State_Code	Primary key Foreign Key	State	Varchar	2	State Code
District_Code	Primary key		Varchar	3	District Code

	Foreign Key	District			
Sub_District_Code	Primary key Foreign Key	Sub_District	Varchar	5	Sub District Code
ULR_Code	Primary key		Varchar	6	Urban Land Region code
ULR_Name			Varchar	50	Urban Land Region name
Latitude			Float	6	Latitude
Longitude			Float	6	Longitude
Soil_Type_Code			Integer	2	Clay, loamy, peaty, chalky etc

### I.6 Table name : Soil\_Type

This master table contains the list of types of Soil

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Soil_Type_Code	Primary key		Integer	2	Soil type code
Soil_Type			Varchar	20	Clay, loamy, peaty, chalky etc.

### I.7 Table name : Village\_Soil\_Types

This master table contains the list of types of soil found in villages. One village may have more than one soil types.

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
State_Code	Primary key Foreign Key	State	Varchar	2	State Code

District_Code	Primary key Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Primary key Foreign Key	Sub_District	Varchar	5	Sub District Code
Village_Code	Primary key Foreign Key	Village	Varchar	6	Village Code
Soil_Type_Code	Primary key Foreign Key	Soil_Type	Integer	2	Soil type code

### I.8      Table name : Agro\_Climatic\_Zone

This master table contains the list of Agro Climatic Zones

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Agro_Climatic_Zone_Code	Primary key		Integer	2	Agro climatic Zone Code
Agro_Climatic_Zone_Name			Varchar	50	Eastern Himalayan region, central plateau hills region etc.

### I.9      Table name : Ministry

This master table contains the list of Ministries

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique		Integer	6	Unique row id

	key				
Ministry_code	Primary key		Integer	3	Code of Ministry
Ministry_Name			Varchar	50	Name of Ministry
Ministry_Short_Name			Varchar	10	
Ministry_Address_Line1			Varchar	60	Address of Head Quarters of Ministry
Ministry_Address_Line2			Varchar	60	Address of Head Quarters of Ministry
Ministry_Address_Line3			Varchar	60	Address of Head Quarters of Ministry
Ministry_Address_Pin_Code			Integer	6	Pin Code

### I.10 Table name : Department

This master table contains the list of Departments in various Ministries

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Ministry_code	Primary key Foreign Key	Ministry	Integer	3	0 for State Department
State_Code	Primary key Foreign Key	State	Varchar	2	“00” for Central Department
Department_Code	Primary key		Integer	2	Department Code
Department_Name			Varchar	50	For e.g. Department of Agriculture & Cooperation
Department_Short_Name			Varchar	10	Department Short Name For e.g. DAC, DARE, DAHDF
Department_Address_Line1			Varchar	60	Address of Head Quarters of Department

Department _Address_Line2			Varchar	60	Address of Head Quarters of Department
Department _Address_Line3			Varchar	60	Address of Head Quarters of Department
Department _Address_Pin_Code			Integer	6	Pin code

### I.11 Table name : Organization Type

This master table contains the list of types of Organizations

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Organisation_Type_Code	Primary key		Integer	2	Organisation Type Code
Organisation_Type_Name			Varchar	50	<ul style="list-style-type: none"> <li>• Attached Offices</li> <li>• Subordinate Offices</li> <li>• Public Sector Undertakings</li> <li>• Autonomous Organisations</li> <li>• National Level Cooperative Organisations</li> <li>• ICAR Institutes</li> </ul>

### I.12 Table name : Organization Sub Type

This master table contains the list of types of Organization Sub-Types

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Organisation_Type_Code	Primary key		Integer	2	Organisation Type Code

	Foreign Key	Organization Sub Type			
Organisation_Sub_Type_Code	Primary key		Integer	2	Organisation Sub Type Code
Organisation_Sub_Type_Name			Varchar	50	<ul style="list-style-type: none"> <li>• Deemed Universities</li> <li>• Institutions</li> <li>• National Research Centers</li> <li>• National Bureau</li> <li>• Project Directorates (All India Coordinated Research Projects), Network Projects, Other projects</li> <li>• Directorates</li> <li>• KVK</li> <li>• Plant Quarantine Stations</li> <li>• Farm Machinery Training &amp; Testing Institutes</li> <li>• Central Integrated Pest Management Centres (CIPMCs)</li> </ul>

### I.13 Table name : Organisation\_Main

This master table contains the list of Organizations

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Organisation_code	Primary key		Integer	5	Organisation code
Ministry_code	Foreign Key	Ministry	Integer	2	Only for Central organisations. 0 for State organisations
Organisation_State_Code	Foreign Key	State	Varchar	2	State Organisations - state code Central organisations

					- “00”
Department_code	Foreign Key	Department	Integer	2	Department code
Division_code	Foreign Key	Division	Integer	2	Division code
Organisation_Type_Code	Foreign Key	Organisation Type	Integer	2	Organisation Type Code
Organisation_Sub-Type_Code	Foreign Key	Organisation Sub Type	Integer	2	Organisation Sub-Type Code
Organisation_Name			Varchar	50	Organisation_Name
Organisation_Short_Name_English			Varchar	10	Short Name for Organisation in English
User_id	Foreign Key	User_Internal	Integer	6	User-id of Office-In-Charge
Organisation_Address_Line1			Varchar	60	Address of Head Quarters of Organisation
Organisation_Address_Line2			Varchar	60	Address of Head Quarters of Organisation
Organisation_Address_Line3			Varchar	60	Address of Head Quarters of Organisation
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	2	District Code
Pin_code			Integer	6	Pin code
TelePhone1			Varchar	16	TelePhone1
TelePhone2			Varchar	16	TelePhone2
TelePhone3			Varchar	16	TelePhone3
Fax1			Varchar	16	Fax1
Fax2			Varchar	16	Fax2
e-mail			Varchar	20	e-mail

### I.14 Table name : Office Type

This master table contains the list of types of Offices

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Office_Type_Code	Primary key		Integer	2	Office Type Code
Office_Type_Name			Varchar	50	<ul style="list-style-type: none"> <li>• Headquarters</li> <li>• Regional Office</li> <li>• Sub Office</li> </ul>

### I.15 Table name : Division

This master table contains the list of Divisions

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Ministry_code	Foreign Key	Ministry	Integer	2	Only for Central organisations. 0 for State organisations
Department_code	Foreign Key	Department	Integer	2	Department Code
Division_Code	Primary key		Integer	2	Division Code
Division_Name			Varchar	50	Division Name

### I.16 Table name : Organisation\_Offices

This master table contains the details of Offices under various organisations

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Organisation_code	Primary		Integer	5	Organisation code

	key Foreign Key	Organisatio n_main			
Office_code	Primary key		Integer	4	Office code
Office_Type_Code	Foreign Key	Organisatio n Type	Integer	2	Office Type Code
Office_Name			Varchar	50	Office Name
Office_Short_Name			Varchar	50	Office Short Name
User_id	Foreign Key	User_Inter nal	Integer		User id of the Office- In-Charge
Office_Address_Line1			Varchar	60	Address of Head Quarters of Office
Office_Address_Line2			Varchar	60	Address of Head Quarters of Office
Office_Address_Line3			Varchar	60	Address of Head Quarters of Office
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	2	District Code
Pin_code			Integer	6	Pin code
TelePhone1			Varchar	16	TelePhone1
TelePhone2			Varchar	16	TelePhone2
TelePhone3			Varchar	16	TelePhone3
Fax1			Varchar	16	Fax1
Fax2			Varchar	16	Fax2
e-mail			Varchar	20	e-mail

### I.17 Table name : Designation

This master table contains the list of Designations

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
Designation_code	Primary key		Integer	2	Designation code
Designation_name			Varchar	30	Joint Secretary, Additional Secretary,

				Section Officer, etc.
Designation_Short		Varchar		Short Name for Designation Like JS, AS, DS, US, SO etc.

### I.18 Table name : Id-Card\_Type

This master table contains the list of types of Identity Cards

Field name	Key	Reference Table	Data type	Max length	Remark
Card_Type_Code	Primary Key		Varchar	3	Card Type Code
Card_Type_Name			Varchar	25	Ration Card, Driving License, Passport, Voter Id, UID, etc.

### I.19 Table Name : Marital\_Status

This master table contains the list of types of Marital Status

Field Name	Key	Reference Table	Data Type	Max Length	Remark
MStatus_Code	Primary Key		Integer	1	Marital Status code
MStatus_Type			Varchar	10	1 - Never married 2 - Currently married 3 - Widow / Widower 4 - Divorced 5- Separated

### I.20 Table Name: Language

This master table contains the list of all official languages of India

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique Row Id

Language_id	Primary key		integer	2	Language Id
Language_Name_English			varchar	30	Language Name in English
Language_Name_Local			Nvarchar	50	Language Name in Local Language

### I.21 Table Name : Krishibhavan (Kerala State)

This master table contains the list of Krishi Bhavans in Kerala. It is state specific requirement.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
State_Code		State	Varchar	2	State Code
District_Code		District	Varchar	3	District Code
Sub_District_Code		Sub District	Varchar	5	Sub-District Code
Village_Code	Primary key	Village	Varchar	6	Village Code
Krishi_Bhavan_Code			Varchar	15	Krishi Bhavan Code
Name_of_Krishibhavan			varchar	50	Name of Krishibhavan
Address1			varchar	30	Address1
Address2			Varchar2	30	Address2
pincode			Char	7	Pincode
Contact_no			Integer	10	Contact no
E_mail_id			varchar	25	email

## II. Data entities for User Management

### II.1 Table name: User\_Internal (For all Government Users)

This table contains the list of Government officials. These official will be given user id and passwords and will participate in various activities like knowledge management, workflow applications, content updations etc.

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	For tracking purpose
User_id (login_name)	Primary key		Integer	6	Distinct code for user
Appellation			Varchar	8	Mr., Mrs. Ms., Shri, Dr., CA, Er., Prof.
Officer_name			Varchar	70	Officer Name
Designation_code	Foreign Key	Designation	Integer	2	Designation code
Marking			Varchar	15	JS(IT), JS(PP), SO/Admin), etc.
Organisation_code	Foreign Key	Organisation_main	Integer	5	Organisation code
Office_code	Foreign Key	Organisation_offices	Integer	4	Office code
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign Key	Tehsil	Varchar	5	Sub-District Code
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign Key	Urban Land Region	Varchar	6	Town/municipality code
Password			Nvarchar	20	Password
email			Varchar	254	email
Phone			Varchar	21	Phone number with

					Country Code and STD code (00-91-11-24305692 for Delhi) Format is xxx-xxx-xxxx-XXXXXXXX
Mobile			Integer	16	Mobile no. with country code 0091(For India) Format is (xxx)(xxx)xxxxxxxxx x
User_role_id			Integer		User Role Id
Isactive			Char	1	Active, Inactive
Registration_by			Varchar	20	User registration by e-mail, SMS, web based interface
Govt_id_number			Varchar	15	Id number provided by the Government to its employee

## II.2 Table name : User\_External

This table will store information about External Users.

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	For tracking purpose
User_id (login_name)	Primary key		Integer	6	Distinct code for user
Appellation			Varchar	8	Mr., Mrs. Ms., Shri, Dr., CA, Er., Prof.
User_name			varchar	70	User Name
Address_Line_1			Varchar	50	Address
Address_Line_2			Varchar	50	Address
Address_Line_3			Varchar	50	Address
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign	Sub_Distri	Varchar	5	Sub-District Code

	Key	ct			
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign Key	Urban_Land_Region	Varchar	6	Urban Land Region
email			Varchar	20	Email Address
Phone			Varchar	21	Phone number with Country Code and STD code (00-91-11-24305692 for Delhi) Format is xxx-xxx-xxxx-xxxxxxxx
Mobile			Integer	16	Mobile no. with country code 0091(For India) Format is (xxx)(xxx)xxxxxxxxxx x
User_type_code	Foreign Key	User_Type	Varchar	2	User type code like govt. User /farmer/dealer /ngo/private firm/research scholar / etc...
User_Status			Char	1	A -Active, I-Inactive, B-Blocked
User_role_id	Foreign Key	User_Role	Integer		User Role Id
Registration_by			Varchar	20	User registration by e-mail, SMS, web based interface
Id_proof_number			Varchar	10	Id number of govt. Card. (Service specific need)
Id_proof_type			Varchar	10	Rationcard_id , voter_id etc.
Caste			Varchar	10	SC,ST, OBC, General, Other
LastAccessDate			Date	10	Last time when user accessed via his account

### **II.3      Table name : User\_Login**

This table contains the list of credentials of External Users.

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
User_Id	Primary key		Varchar	2	User Id
Password			Varchar	20	Password in encrypted form
User_Type_Code	Foreign Key	User_Type	Varchar	2	Farmer /dealer wholesalers/retailer/exporter/importer/research scholar / private firm / NGO/ other

### **II.4      Table name : User\_Type**

This table contains the list of Types of Users

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
User_type_code	Primary key		Varchar	2	User type code
User_type			Varchar	20	Govt. User/farmer /dealer wholesalers/retailer/exporter/importer/research scholar / private firm / NGO/ other

## II.5 Table name : User\_Role

This table contains the list of User Roles

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Unique key		Integer	6	Unique row id
User_role_id	Primary Key		Integer	2	User role id
User_role			Varchar	30	Role description as defined by administrator

## II.6 Table Name : Sector

This table contains the list of Agricultural Sectors

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Sector_Code	Primary Key		Integer	2	Sector Code
Sector_Name			VarChar	25	Sector Name (Agriculture, horticulture, floriculture, Livestock, Fisheries)

### III. Data entities for Grievance Redressal and Management

#### III.1 Table Name : Grievance\_Type

This table contains the list of Types of Grievances.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Grievance_Type_Code	Primary Key		Integer	2	Grievance Type Code
Grievance_Type			VarChar	50	Grievance Type for e.g. crop related, loan related, subsidy related etc.
User_id_Level1	Foreign Key	User_Internal	Integer	6	User Id of Level 1 officer in Escalation Matrix
User_id_level2	Foreign Key	User_Internal	Integer	6	User Id of Level 2 officer in Escalation Matrix
User_id_level3	Foreign Key	User_Internal	Integer	6	User Id of Level 3 officer in Escalation Matrix

#### III.2 Table Name : Grievance\_Registration

This table contains the details of Grievances registered.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Grievance_Id	Primary Key		VarChar	25	Unique number assigned to the grievance for reference and send to

					the Kisan Call Center application system in the form “YYYYSSDDDNN NNNN” where YYYY-YEAR SS-State Code, Central Department Code DDD-District Code NNNNNNN-06 Digit Application Number
Grievance_Registration_Date			Date	10	Grievance Registration Date
Sector_Code	Foreign Key	Sector	Integer	2	Sector Code
Grievance_Type	Foreign Key	Grievance Type	Integer	2	Grievance Type
User_id	Foreign Key	User_id (login_name)	Integer	6	Distinct code for user
Grievance_Description			Nvarchar	100	Description of Grievance

### III.3 Table Name : Grievance\_Attached\_Documents

This table contains the list of documents linked to a registered grievance.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Grievance_Id	Primary Key Foreign Key	Grievance_Registration	Nvarchar	25	Unique number assigned to the grievance for reference and send to the Kisan Call Center application system in the form “YYYYSSDDDNN NNNN” where YYYY-YEAR SS-State Code,

					Central Department Code DDD-District Code NNNNNN-64 Digit Application Number
Attachment_serial_number	Primary key		Integer	2	Distinct code for attachment
Attachment_scan			Image		To store the scan copy of application and any other attachment with the application

### III.4 Table Name : Grievance\_Flow

This table contains the details of workflow of grievances.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Grievance_Id	Primary Key Foreign Key	Grievance_Registration	Nvarchar	25	Unique number assigned to the grievance for reference and send to the Kisan Call Center application system in the form “YYYYSSDDDNNNNN” where YYYY-YEAR SS-State Code, Central Department Code DDD-District Code NNNNNN-06 Digit Application Number
Marked_By	Primary Key Foreign Key	User_Internal	Integer	6	User_id of the officer who has forwarded the Grievance
Marked_By_Date	Primary Key		DateTime		Date and time at which grievance is forwarded

Marked_To	Primary key Foreign Key	User_Internal	Integer	6	User_id of the officer to whom Grievance is marked
Marked_To_Date	Primary Key		DateTime		Date and time at which grievance is marked
Remarks			Char	1000	Remarks by officer
Appl_Status			Char		Status of Application (Resolved/Pending/Closed/Under Process/Spam(No action required)

## IV. Data entities for Expert Advisory System

### IV.1. Table Name : EA\_Sub\_Category

This table contains the list of Expert Advisory Categories

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
EA_Type_Code	Primary Key		Integer	2	Expert Advisory type code.
EA_Type					Subject Category in which Expert Advisory is needed For e.g. Pest Management, Fertilisers to be used, Crops to be grown, etc.
User_id_Level1	Foreign Key	User_Internal			User Id of Level 1 officer in Escalation Matrix
User_id_level2	Foreign Key	User_Internal			User Id of Level 2 officer in Escalation Matrix
User_id_level3	Foreign Key	User_Internal			User Id of Level 3 officer in Escalation Matrix

#### IV.2. Table Name : EA\_Queryposting

This table contains details of queries posted for Expert Advise by the users.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
EA_Id	Primary Key		Nvarchar	25	Unique number assigned to the Query for reference and send to the Kisan Call Center application system in the form “YYYYSSDDDDNN NNNN” where YYYY-YEAR SS-State Code, Central Department Code DDD-District Code NNNNNNN-06 Digit Application Number
EA_Posting_Date			Date		Date on which Query has been Posted to get Expert advice
EA_Category_Code	Foreign Key	EA-Category	Integer	2	Subject Category in which Expert Advisory is needed
Sector_Code	Sector		Integer	2	Sector Code
User_id	Primary key		Integer	6	Distinct code for user who has posted the query to get Expert Advice
EA_Description			Nvarchar	100	Query Description

#### **IV.3. Table Name : EA\_Attached\_Documents**

This table contains the list of documents attached and their scanned copies along with Expert Advisory Queries.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
EA_Id	Primary Key Foreign Key	EA-QueryPosting	Nvarchar	25	Unique number assigned to the query for reference and send to the Kisan Call Center application system in the form “YYYYDDDDNNNN NN” where YYYY-YEAR SS-State Code, Central Department Code DDD-District Code NNNNNN-06 Digit Application Number
Attachment_id	Primary key		Integer	2	Distinct code for attachment
Attachment_scan			Image		To store the scan copy of the application or any other attachment provided with the application

#### **IV.4. Table Name : EA\_Query\_Flow**

This table captures the flow of Expert Advisory Queries.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique key		Integer	6	Unique row id
Query_Id	Primary		Nvarchar	25	Unique number

	Key Foreign Key	EA_QueryPo sting			assigned to the query for reference and send to the Kisan Call Center application system in the form “YYYYSSDDDDNN NNNN” where YYYY-YEAR SS-State Code, Central Department Code DD-District Code NNNNNNN-06 Digit Application Number
Marked_By	Primary Key Foreign Key	User_Internal	Integer	6	User_id of the Expert who has forwarded the query
Marked_By_Date	Primary Key		DateTime		Date and time at which query is forwarded
Marked_To	Primary key Foreign Key	User_Internal	Integer	6	User_id of the Expert to whom Query is marked
Marked_To_Date	Primary Key		DateTime		Date and time at which query is marked
Expert_Advice			Char	1000	Advice by Expert
Query_Status			Char		Status of the Query (Resolved/Pending/Un der Process/Closed/No action required)

## V. Data entities for National Farmers' database

### Master Tables

#### V.1.Table Name : Education

This master table contains the list of Education Qualification Types

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Education_code	Primary Key		Integer	3	Education Code
Education_type			varchar	25	Illiterate , Non-Matric, Matric, graduate, post-graduate, Diploma, Other

#### V.2.Table Name : Irrigation

This master table contains the list of types of Irrigation facilities

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Irrigation_code	Primary Key		Integer	3	Irrigation Code
Irrigation_type			Varchar	25	Wells, tube wells, drip irrigation, etc.

#### V.3.Table Name : Area

This master table contains the list of types of Area

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique		Integer	6	Unique Row Id

	Key				
Area_code	Primary Key		Integer	2	Area Code
Area_type			Varchar	25	Area under Nursery, Area under vegetable crops , Area under permanent crops , Area under progeny orchard , Planting materials , Tuber crops

#### V.4. Unit

This master table contains the list of units used for measures.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Unit_code	Primary Key		Integer	1	Unit Code
Unit_Name			VarChar	30	Sq. Meters, Sq. Hectares, etc
Measure_Type			Varchar	10	Area, Volume, Length, Weight, Width, amount Etc.

#### V.5. Table Name : Conversion\_Factor

This master table contains the list of Conversion formulas between the two units

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Unit_Code_1	Primary Key Foreign Key	Unit	Varchar	25	Unit Code of the unit which is to be converted
Unit_Code_2	Primary Key	Unit	Varchar	25	Unit Code of the unit in which above

	Foreign Key				Unit is to be converted
Conversion_formula			Integer	10	Conversion formula value xxx 1 Unit1 = xxx Unit2

#### V.6.Table Name : Dealers

This table contains the list of Dealers

Same structure as envisaged in Service 1: Providing information on Quality Seeds, Pesticides and Fertilisers

#### V.7. Table Name : Market

This table contains the list of Markets

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Market_center_code	Primary Key		smallint		Market Centre Code
Market_center_name			Varchar	50	Market Centre Name
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Smallint		District Code
Address			Varchar	200	Address of Market
Phone_no1			Varchar	16	Phone Number
Phone_no2			Varchar	16	Phone Number
Phone_no3			Varchar	16	Phone Number
Email			Varchar	150	Email Address

### V.8. Table Name: Bank

This table contains the list of Markets

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Bank_code			integer		Bank Code
Bank_Name			Varchar	30	Bank Name
Bank_Address_Line1			Varchar	60	Bank Address Line 1
Bank_Address_Line2			Varchar	60	Bank Address Line 2
Bank_Address_Line3			Varchar	60	Bank Address Line 3
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign Key	Sub_District	Varchar	5	Sub District Code
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign Key	Town	Varchar	6	Town/municipality code
Branch_email			Varchar	254	Branch Email
Branch_phone1			Varchar	16	Branch Phone 1
Branch_phone2			Varchar	16	Branch Phone 2
Branch_phone3			Varchar	16	Branch Phone 3

### V.9.Table Name : Bank\_Branches

This master table contains the list of Branches of Banks

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id

Bank_code			integer		Bank Code
Branch_code			Varchar	15	Branch Code
MICR_Code	Primary Key		Varchar	9	9 digit MICR Code, in which first 3 digit corresponds to city code, next 3 digit to bank code and later 3 digit to branch code. It is unique for each branch and bank
RTGS_Code			Varchar	15	RTGS Code of the bank
Branch_name			Varchar	30	Branch Name
Branch_Address_Line1			Varchar	60	Branch Address Line 1
Branch_Address_Line2			Varchar	60	Branch Address Line 2
Branch_Address_Line3			Varchar	60	Branch Address Line 3
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign Key	Sub_District	Varchar	5	Sub District Code
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign Key	Town	Varchar	6	Town/municipality code
Branch_email			Varchar	254	Branch Email
Branch_phone1			Varchar	21	Branch Phone 1
Branch_phone2			Varchar	21	Branch Phone 2
Branch_phone3			Varchar	21	Branch Phone 3

#### V.10. Table Name : Insurance\_Agency

This master table contains the list of Insurance Agencies

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id

Agency_code	Primary Key		Integer	5	Agency Code
Agency_Name			Varchar	100	Agency Name
Agency_Address-Line1			Varchar	60	Agency Address Line 1
Agency_Address_Line2			Varchar	60	Agency Address Line 2
Agency_Address_Line3			Varchar	60	Agency Address Line 3
Agency_Phone			Varchar	21	Agency Phone
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign Key	Sub_District	Varchar	5	Sub District Code
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign Key	Town	Varchar	6	Town/municipality code

### V.11. Table Name :Agency\_ Insurance\_Type

This master table contains the list of types of Insurances

Field Name	Key	Reference Table	Data Type	Max length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Agency_code	Foreign Key	Insurance	Integer	5	Agency Code
Insurance_Type_Code	Primary Key		Varchar	15	Insurance Type Code
Insurance_Type			Varchar	25	Insurance Type

### V.12. Table Name : Society

This master table contains the list of Societies

Field Name	Key	Reference Table	Data Type	Max Length	Remark

<b>Id</b>	<b>Unique Key</b>		<b>Integer</b>	<b>6</b>	<b>Unique Row Id</b>
<b>Society_code</b>	<b>Primary Key</b>		<b>Integer</b>	<b>6</b>	<b>Society code</b>
<b>Society_Name</b>			<b>Varchar</b>	<b>25</b>	<b>District Specific Society Detail</b>
<b>Society_Address_Line 1</b>			<b>Varchar</b>	<b>60</b>	<b>Society Address Line 1</b>
<b>Society_Address_Line 2</b>			<b>Varchar</b>	<b>60</b>	<b>Society Address Line 2</b>
<b>Society_Address_Line 3</b>			<b>Varchar</b>	<b>60</b>	<b>Society Address Line 3</b>
<b>Society_Phone</b>			<b>Varchar</b>	<b>21</b>	<b>Society Phone</b>
<b>State_Code</b>	<b>Foreign Key</b>	<b>State</b>	<b>Varchar</b>	<b>2</b>	<b>State Code</b>
<b>District_Code</b>	<b>Foreign Key</b>	<b>District</b>	<b>Varchar</b>	<b>3</b>	<b>District Code</b>
<b>Sub_District_Code</b>	<b>Foreign Key</b>	<b>Tehsil</b>	<b>Varchar</b>	<b>5</b>	<b>Sub District Code</b>
<b>Village_Code</b>	<b>Foreign key</b>	<b>Village</b>	<b>Varchar</b>	<b>6</b>	<b>Village Code</b>
<b>ULR_Code</b>	<b>Foreign Key</b>	<b>Town</b>	<b>Varchar</b>	<b>6</b>	<b>Town/municipality code</b>
<b>Society_email</b>			<b>Varchar</b>	<b>254</b>	<b>Society email</b>
<b>Society_Fax</b>			<b>Varchar</b>	<b>16</b>	<b>Society Fax</b>
<b>Society_Telephone</b>			<b>Varchar</b>	<b>16</b>	<b>Society Telephone</b>

### **V.13.      Table Name : Seed**

This master table contains the list of Seeds.

Same structure as envisaged in Service 1: Providing information on Quality Seeds, Pesticides and Fertilisers

### **V.14.      Table Name : Farming\_Inputs**

This master table contains the list of Farming Inputs

Same structure as envisaged in Service 1: Providing information on Quality Seeds, Pesticides and Fertilisers

**V.15. Table Name : Schemes**

This table contains the list of Schemes

As defined in Service 8: Monitoring implementation / Evaluation of schemes & programs

**V.16. Table Name : Commodity**

This master table contains the list of commodities. Commodities include processed commodities. Code will be used as per FAO classifications

<http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm>

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Comm_code	Primary Key		Char	4	As per FAO classification <a href="http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm">http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm</a>
Comm_name			Varchar	50	Commodity Code
MSP			Varchar	50	Market Selling price
HS_code			Integer	8	Harmonized System Code

**V.17. Table Name : Farmer\_Sub\_Type**

This master table contains the list of sub types of Farmer, like Cotton farmer, Sugarcane farmer, etc.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Farmer_Sub_Type_Code	Primary Key		Varchar	3	Farmer Sub Type Code
Farmer_Sub_Type			Varchar	25	Crop Farming-

					Cotton, Rice, Maze, sugarcane etc. Fish farming- Trout, Lobsters etc. Horticulture Farming(Apple, Mango etc
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### V.18. Table Name : Training

This master table contains the list of types of Trainings

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Training_Code	Primary Key		Varchar	3	Training Code
Training_type			Varchar	25	Extension works, knowledge on inputs, mechanical operations of farm equipment, repairs of farm equipment etc...

### V.19. Table Name : Knowledge\_Source

This master table contains the list of source of knowledge

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Source_Code	Primary Key		Varchar	3	Source Code
Source_Type			Varchar	30	State Agriculture

					Departments, KVK, SAU, ICAR, Helpline (toll Free numbers), Meetings, Trainings/ Workshops, TV, Radio, SMS, progressive farmers, extension workers, etc.
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#### V.20.      Table Name : Equipments (same as AG Census)

This master table contains the list of Equipments

Field Name	Key	Reference tbale	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Equipment_Code	Primary Key		Integer	3	Equipment Code
Equipment_Name			Varchar	50	Self / Hired Basis etc...
Equipment_image					Image of Equipment
Equipment_video					Video providing information about the Equipment like how to operate, etc.
Equipment_specification			varchar	100	Equipment Specifications

Equipments: 1. Tractor 2. Tiller 3. Coconut Climbing Machine 4. Sowing Machine  
 5. Sealing Machine 6. Harvesting Machine, 7. Digging Machine, 8. Bund Construction Equipment , 9. Winnowing Machine, 10. Milk Rearing Machine

**Transaction Tables****V.21. Table Name: Farmer\_Personal\_Details**

This table contains the details of Farmers registered

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
State_Code	Foreign Key	State	Varchar	2	State Code
District_Code	Foreign Key	District	Varchar	3	District Code
Sub_District_Code	Foreign Key	Sub District	Varchar	5	Sub District Code
Village_Code	Foreign key	Village	Varchar	6	Village Code
ULR_Code	Foreign key	Ward	Varchar	6	Ward code
Krishi_Bhavan_code	Foreign Key	Krishi_Bha van	Varchar	15	Krishi Bhawan Code
Farmer_Id	Primary Key		Integer	10	Farmer Id
Photo			Image		Photo of Farmer
UID			Integer	12	UID Number Aadhaar number
Ration_Card_No			Varchar	15	Ration Card Number
Voter_ID_No			Varchar	15	Voter Id Number
Kisan_Credit_Card_No			Varchar	15	Kisan Credit Card Number
PAN Card No			Varchar	15	PAN Card Number
Driving_License_No			Varchar	15	Driving License Number
NPR_No			Varchar	15	National Population Register Number
Other_ID_No			Varchar	15	Other Id Number

Other_ID_Name			Varchar	25	Other Id Name
Visible_Id_Mark			Varchar	50	Visible Identification
Farmer_Name			Varchar	99	FirstName+Middle Name+Lastname
Father_Name			Varchar	99	Father Name
Mother_Name			Varchar	99	Mother Name
Spouse_Name			Varchar	99	Spouse Name
Education_code	Foreign Key	Education	Integer	3	Education Code
Date_of_Birth			Date	10	dd/mm/YYYY
Gender			Char	6	Male/Female
Religion_code	Foreign Key	Religion Code	Integer	2	Education Code
Caste_Code	Foreign Key	Caste	Varchar	2	Caste Code
Marital_Status_Code	Foreign Key	Marital Status	Integer	1	1 - Never married 2 - Currently married 3 - Widow / Widower 4 - Divorced 5- Separated
Family_member_number			Integer	2	Number of Family Members
Adults			Integer	2	Number of Adults in Family
Children			Integer	2	Number of Children in Family
No_of_Comp_literate			Integer	2	No. of Computer literate
House_no			Varchar	5	House Number
Pincode			Integer	10	Pin code
Phone			Varchar	21	Phone Number
Mobile			Integer	14	Mobile Number
Email			Varchar	254	Email address
Annual_Income			Integer	6	Annual Income
Nearest_Market_code			Integer	5	Nearest market Code
Distance_to_Nearest_Market			Integer	3	Distance in km
Mode_of_marketing			Integer	1	1-Through Middleman

					2-2Direct Market 3-As value added product
House_Ownership			Varchar	6	Owned/Rental
House_Type			Varchar	6	Pakka/Kaccha
House_Area			Integer	6	House Area
Area_Unit_code	Foreign Key	Unit	Integer	2	Sq. Meters, Sq. Hectares, etc
Category_Code			Varchar	3	SC/ST/BC/ OBC/Gen
Biogas_Plant			Varchar	2	Yes/No
Minority_status			Varchar	10	Yes/No

## V.22.      Table Name: Farmer\_Type

This table contains the list of types of Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Integer	10	Farmer Id
Farmer_Type		Farmer Type	Varchar	25	Agricultural Crops, Horticulture, Floriculture Livestock, Sericulture, etc.
Farmer_Sub_Type_C ode	Foreign Key	Farmer Sub Type	Varchar	3	Crop Farming – Rice, Wheat Hort – Apple, Mango, Multiple Commodities

### V.23. Table Name : Farmer\_Field\_Knowledge\_details

This table contains the details of field knowledge with Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Source_Code	Primary Key Foreign Key	Knowledge_Source	Integer	3	Source Code

### V.24. Table Name : Farmer\_Land\_details

This table contains the details of farming land

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Khata_No	Primary Key		Varchar	10	Khata Number
Khasra_No	Primary Key		VarChar	10	Khasra Number
Rin_Pustika_No	Primary Key		VarChar	15	Rin Pustika Number
Survey_No	Primary Key		Varchar	15	Survey Number
Sub_Survey_No	Primary Key		Varchar	15	Sub Survey Number

Farm_Size			Varchar	10	Farm Size
Land_Type		Land Type	Varchar	10	Irrigated/Rainfed/Dry Land)
Soil_Type_code	Foreign Key	Soil Type			Soil Type Code
Area_type_code	Foreign Key	Area Type			Area under Nursery, Vegetable crops, etc.
Manpower_code					Self/Hired Manpower

Remark : Service 2 will have soil test and fertilizer usage as per soil test related tables

### **V.25.      Table Name : Farmer\_Irrigation\_Details**

This table contains the list of Irrigation Equipments used by the Farmer for farming and related activities

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Khata_No	Primary Key		Varchar	10	Khata Number
Khasra_No	Primary Key		VarChar	10	Khasra Number
Rin_Pustika_No	Primary Key		VarChar	15	Rin Pustika Number
Survey_No	Primary Key		Varchar	15	Survey Number
Sub_Survey_No	Primary Key		Varchar	15	Sub Survey Number
Cultivation_Type			Varchar	6	Self/Leased/Shared
Irrigation_Code	Primary Key Foreign Key	Irrigation	Integer	3	Wells, tube wells, Drip Irrigation
Nature_of_electric_connection			Integer	1	1-Single Phase 2-Three Phase

**V.26. Table Name : Farmer\_Crop\_Details**

This table contains the list of Crops produced by Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year			Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Crop_Code	Primary Key Foreign Key	Commodity	Varchar	3	Commodity Code of the crop grown by farmer As per FAO classification <a href="http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm">http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm</a>
Crop_Cycle	Primary Key		Integer	2	1. April-September 2. September-December 3. December-April 4. Whole Year 5. Seasonal

**V.27. Table Name : Farmer\_Animals\_Owned**

This table contains information about number of animals owned by farmer

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year

Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Animal_Name	Primary Key Foreign Key	Animal	Integer	3	Animal Name as cattle, Buffalo, Dog, etc. Same as NADRS database
Animal_Breed					Breed of the animal. Will be taken from NADRS database
Animal_Type			Char	1	C- Crossbreed, E- Exotic, I-Indigenous
Animal_Count			Integer	2	Number of Animals owned by farmer

### V.28. Table Name : Farmer\_Equipment\_Owned

This table contains the list of equipments owned by Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Equipment_Code	Primary Key Foreign Key	Equipment	Integer	3	Equipment Code
Count			Integer	3	Number of Equipments owned by farmer

**V.29. Table Name : Farmer\_Equipment\_Type\_Owned**

This table contains the details of Equipments types, make and model owned by Farmer

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Equipment_Code	Primary Key Foreign Key	Equipment	Integer	3	Equipment Code
Serial Number			Varchar	30	Serial number of Equipment
Model			Varchar	15	Model of the equipment
Make			Varchar	15	Make of the equipment
Purchase_Type			Varchar	15	Self Finance/Loan (separate table is to be made)

**V.30. Table Name : Farmer\_Dealers\_Approached**

This table contains the list of dealers farmer is dealing with.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Dealer_Code	Primary Key Foreign Key	Dealer	Integer	2	Dealer Code

**V.31. Table Name : Farmer\_Bank**

This table contains the list of bank accounts of Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
MICR_Code	Primary Key Foreign Key	Bank	Varchar	15	MICR Code
Account_Number	Primary Key		Integer	30	Account Number of the farmer
Loan_code	Primary Key		Varchar	10	Loan Code
Loan_Source			Varchar	25	Loan Source
Loan_Amount			Integer	6	Loan Amount
Kisan_Credit_Card			Char	3	Kisan Credit Card Number / Status
Kisan_Credit_limit			Integer	6	Kisan Credit Limit

**V.32. Table Name : Farmer\_Insurance\_Details**

This table contains the details of Farmer's insurances

Field Name	Key	Reference Table	Data Type	Max length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Agency_code	Primary	Insurance	Varchar	15	Agency Code

	Key Foreign Key				
Insurance_Type_Code	Primary Key		Varchar	15	Insurance Type Code
Insured_On			Date	10	Insurance Date
Policy_No	Primary Code		Varchar	15	Policy Number
Maturity_Date			date	10	Maturity Date
Premium			Integer	6	Premium
Payment_Mode			Varchar	10	Payment Mode

### V.33. Table Name : Farmer\_Economical\_Status

This table contains the economic details of Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year			Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Integer	10	Farmer Id
Poverty_Status			Varchar	15	Poverty Status
Annual_Income_Far m			Integer	6	Annual Income from Farm
Annual_Income_Liv estock			Integer	6	Annual Income from Lives Stock
Annual_Income_Fis heries			Integer	6	Annual Income from Fisheries
Annual_Income_Oth er			Integer	6	Annual Income from Other Source
Other			Varchar	30	Name of Other Source

**V.34. Table Name : Farmer\_Society\_membership**

This table contains the details of societies with which farmer is linked

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Coce		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Integer	10	Farmer Id
Society_code	Primary Key Foreign Key	Society	Varchar	3	Society Code
Membership_No			Varchar	25	Membership Number
Issue_date			Varchar	10	Issuing Date
Validity_date			Varchar	10	Validity Date

**V.35. Table Name : Farmer\_Seed\_Procurement\_details**

This table contains the list of Seed Procurements done by Farmer

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Varchar	15	Farmer Id
Commodity_code	Primary Key Foreign Key	Commodity	Varchar	2	Commodity Code
Seed_Variety_code	Primary Key		Varchar	25	Seed Variety Code

	Foreign Key				
Quantity			Integer	6	Quantity
Unit			Varchar	3	(Nos, KGs, Packets etc)
Source_of_Procurement			Varchar	25	1. Govt. Agencies 2. Pvt. Agencies

### V.36. Table Name :Farmer\_Inputs\_Used (Fertilizers/ Pesticides/Fodder Etc.)

This table contains the details of Fertilizers/ Pesticides/ Fodder used by the Farmer

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Varchar	15	Farmer Id
Input_code	Primary Key Foreign Key		Varchar	3	Input Code
Quantity			Integer	5	Quantity
Unit_Code			Varchar	3	(Nos,KGs,Packets etc)
Purchased_From			Varchar	25	(Dealer/Agency etc.)

### V.37. Table Name :Farmer\_ Farming\_Details

This table contains the farming details related to Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary		Varchar	15	Farmer Id

	Key Foreign Key	Farmer_Per sonal_Detail s			
Khata_No	Primary Key Foreign Key	Land	Varchar	10	Khata Number
Khasra_No	Primary Key Foreign Key	Land	Varchar	10	Khasra Number
Rin_Pustika_No	Primary Key Foreign Key	Land	Varchar	15	Rin Pustika Number
Survey_No	Primary Key Foreign Key	Land	Varchar	15	Survey Number
Sub_Survey_No	Primary Key Foreign Key	Land	Varchar	15	Sub Survey Number
Commodity_code	Primary Key Foreign Key	Commodity	Varchar	3	Commodity Code
Crop_Pattern			Varchar	1	(Rabi/Khariff/Both)
Area_Number_unde r_cultivation			Varchar	10	(Area for Agriculture and Number for Livestock)
Annual_Production			Integer	6	
Unit_Code			Varchar	3	(Nos, KGs, Packets etc)

### V.38. Table Name : Farmer\_Harvesting\_Details

This table contains the harvesting details

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year			Integer	4	Year

Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Varchar	15	Farmer Id
Khata_No	Primary Key Foreign Key	Land	Varchar	10	Khats Number
Khasra_No	Primary Key Foreign Key	Land	Varchar	10	Khasra Number
Rin_Pustika_No	Primary Key Foreign Key	Land	Varchar	15	Rin Pustika Number
Survey_No	Primary Key Foreign Key	Land	Varchar	15	Survey Number
Sub_Survey_No	Primary Key Foreign Key	Land	Varchar	15	Sub Survey Number
Crop_Produce_code	Primary Key Foreign Key	Commodity	Varchar	3	Crop Produce Code
Crop_Pattern			Varchar	1	(Rabi/Khariff/Both)
Area_Number_unde r_cultivation			Varchar	10	(Area for Agriculture and Number for Livestock)
Expected_Productio n			Integer	6	Expected Production
Unit			Varchar	3	(Nos, KGs, Packets etc)
Quantity_ready_for_ Market			varchar	6	Quantity ready for market
Converted_to_value _added_ptoduct			varchar	1	(Yes/No)
Expected_Productio n_Month			Varchar	2	Expected Month Of Production
Expected_Productio n_Year			Varchar	4	Expected Year Of Production

**V.39. Table Name : Farmer\_Loan\_Details**

This table contains the details of the loans issued to farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year			Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Personal_Details	Varchar	15	Farmer Id
Agency_Code	Primary Key Foreign Key		Varchar	3	Agency Code
Branch_Code	Primary Key Foreign Key		varchar	15	Branch Code
RTGS_Code	Primary Key Foreign Key		Varchar	20	RTGS Code
Loan_No	Primary Key		varchar	25	Loan Number
Loan_Amount			Integer	6	Loan Amount
Loan_from			Date	10	Loan From Date
Loan_To			Date	10	Loan To Date
Mode_of_Payment			Varchar		Monthly, Bi-monthly, Quarterly, Yearly
Installment_Amount					Installment amount
Balance_As_On_Date			Integer	6	Balance as on Date

**V.40. Table Name : Farmer\_Commodities\_Processed**

This table contains details of the commodities being processed by the farmer.

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique		Integer	6	Unique Row Id

	Key				
Year	Primary Key		Integer	4	Year
State_Code	Primary Key Foreign Key	State	Varchar	2	State Code
District_Code	Primary Key Foreign Key	District	Varchar	3	District Code
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Varchar	15	Farmer Id
Commodity_code	Primary Key Foreign Key	Commodity	Varchar	2	Commodity Code
Quantity			Integer	6	Quantity
Unit_code			Varchar	3	(Nos, KGs, Packets etc)

#### V.41. Table Name : Farmer\_Dairy\_Production\_details

This table contains the details of dairy production related to Farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Varchar	15	Farmer Id
Animal_Name	Primary Key Foreign Key	Animal	Integer	3	Animal Name as cattle, Buffalo, Dog, etc. Same as NADRS database
Animal_Breed					Breed of the animal. Will be taken from

					NADRS database
Animal_Type			Char	1	C- Crossbreed, E- Exotic, I-Indigenous
Daily_Production					
Current_Price_of_Milk			Interger	3	
Milk_procured_by			Integer	1	1.Consumers 2.Milk Society

#### V.42. Table Name : Farmer\_Poultry\_Details

This table contains the details of poultry production related to farmers

Field Name	Key	Reference Table	Data Type	Max Length	Remark
Id	Unique Key		Integer	6	Unique Row Id
Year	Primary Key		Integer	4	Year
Farmer_Id	Primary Key Foreign Key	Farmer_Per sonal_Detail s	Varchar	15	Farmer Id
Poultry_Category	Primary Key Foreign Key		Interger	1	1.Broiler 2.Country Chicken 3.Hen 3.Duck 4.Quail 5.Swan
Daily_Meat_Product ion			Integer	5	
Daily_Egg_Producti on			Interger	5	
Own_Hatchery			Integer	1	1.Yes 2.No

## VI. Audit Trail

If database selected for development has automatic audit trail generation feature and if it is adequate to satisfy the needs of the project, then it will be used. Otherwise the following strategy will be adopted for generating audit trails.

- A. Following fields will be created in each table to maintain audit trail of actions (i) creation (insertion) and (ii) deletion of records from the database tables -

Field name	Key	Reference Table	Data type	Max length	Remark
Created_by					id number of the user who created this record
Created_date					date and time the record was created
Active_Inactive					Active_Inactive status of the record  If deleted, the record will be marked as “D” and user_id will be stored in the field Modified_by. Date of deletion will be stored in Modified_date

- B. To keep audit trail of each action of modification, history table will be created for each table depending upon the sensitivity of the information with the following fields -

Table\_Name: XXXXXXXX\_History (XXXXXXX will be the name of the original table)

Field name	Key	Reference Table	Data type	Max length	Remark
Id	Primary Key  Foreign Key	Original Table XXXXXXXXXX			
Modified_by	Primary				id number of the user

	Key				who created this record
Modified_date	Primary key				date and time the record was created
Field_name	Primary Key		Varchar		Name of the field which is being modified
Field_Value_Old			Varchar	Maximum Field length in the table	Old value of the field
Field_Value_New				Maximum field length in the table	New Value of the field

## Ministry of Agriculture – Organisation Structure

### Departments under Ministry of Agriculture

- Department of Agriculture & Cooperation (DAC)
- Department of Agricultural Research and Education (DARE)
- Department of Animal Husbandry, Dairying and Fisheries (DHDF)

#### I. Department of Agriculture & Cooperation (DAC)

##### a. DAC Headquarters

##### b. Attached offices

1. Commission for Agricultural Costs and Prices Shastri Bhawan "F" wing New Delhi-110001.(Ph.No. 23385216)
2. Directorate of Economics and Statistics, Shastri Bhawan "B" wing New Delhi-110001 (Ph. No.23382719)
3. Directorate of Plant Protection, Quarantine and Storage N.H.-IV, Faridabad (Haryana)(Ph.No. 3384182 & 91-213985)
  - a) Plant Protection Division
  - b) Directorate of Plant Protection Quarantine & Storage(DPPQ&S)
  - c) Central Integrated Pest Management Centres (CIPMCs) (31 centers)
  - d) Pesticides Registration
  - e) Plant Quarantine Stations (35 PQS)
  - f) Locust Control Centers (15)
  - g) Human Resources & Training
4. Directorate of Marketing & Inspection, N.H. IV, Faridabad

##### c. Subordinate offices

#### Crops Division

1. Directorate of Sugarcane Development, 8th Floor, Hall No.3, Kendriya Bhavan, Aliganj, Lucknow -226024

2. Directorate of Jute Development, 234/4, Acharya Jagdish Bose Road, Nizam Palace Campus, Calcutta-700020 (West Bengal) (Ph. No. 2479337 )
3. Directorate of Tobacco Development, 26 Haddows Road, 3rd Floor, Shastri Bhavan Annexe, Chennai-600006 (Tamil Nadu) (Ph. No. 8270076 )
4. Directorate of Rice Development, 191, Patilputra Colony, Patna - 800013 (Bihar) (Ph. No.262720)
5. Directorate of Millets Development, Mini Secretariat Building, Room No. 710, Bani Park Jaipur (Rajasthan) (Ph.No. 200038)
6. Directorate of Cotton Development, 14, Ramjibhai Kamani Marg, Ballard Estate P.B. No.1002, Mumbai-400030 (Maharashtra) (Ph. No. 2611449 )
7. Directorate of Wheat Development C.G.O. Building Hapur Road Chauraha, Kamla Nehru Nagar, Ghaziabad.

**Extension Division**

1. Directorate of Extension, Krishi Vistar Bhawan, Dr. K.S. Krishna Marg, IARI Campus Pusa, New Delhi - 110012 (Ph.No. 5725924 )

**Technology Mission on Oilseeds and Pulses**

1. Directorate of Oilseeds Development, Telhan Bhavan, Himayat Nagar, Hyderabad-500029 (Andhra Pradesh) (Ph.No. 235257 )
2. Directorate of Pulses Development, 8th Floor, Vindhya Bhawan, Bhopal (Madhya Pradesh)

**Horticulture Division**

1. Directorate of Areca nut and Spices Development, Cannanore Road, Kozhikode - 673005 (Kerala). (Ph.No. 765777)
2. Directorate of Cashewnut and Cocoa Development, M.G. Road, Cochin-682011 (Kerala). (Ph. No. 373239)

**International Cooperation Division**

1. Minister (Agriculture), Embassy of India, Rome (Italy).

Telephone No. : 003906-4826371(direct), 003906-4884642-45 : Extension 934, Fax No. 48904470

**Fertilizer Division**

1. Central fertilizer Quality Control and Training Institute, N.H. IV, Faridabad (Haryana)
2. National Centre of Organic Farming, C.G.O Complex, Kamla Nehru Nagar, Hapur Road Chungi, Ghaziabad (U.P.)

**Agricultural Implements and Machinery Division**

1. Central Farm Machinery Training and Testing Institute, Budni (Madhya Pradesh)
2. Northern Region Farm Machinery Training and Testing Institute, Hissar (Haryana)
3. Southern Region Farm Machinery Training and Testing Institute, Garladinne, Distt. Anantpur, (Andhra Pradesh)
4. North Eastern Region Farm Machinery Training and Testing Institute, Biswanath Chariali, Distt. Sonitpur, (Assam).

**Natural Resource Management Division**

1. Soil and Land Use Survey of India (SLUSI) , IARI, Pusa, New Delhi - 110012. (Ph.No. 25841263, 25849486)

**Seed Division**

1. National Seeds Research and Training centre(NSRTC), varanasi(Uttar Pradesh)

**d. Public sector undertakings**

1. State Farms Corporation of India, Farm Bhawan, 14-15, Nehru Place, New Delhi 110019.
2. National Seeds Corporation, Beej Bhawan, Pusa Complex, New Delhi -110012.

**e. Autonomous organisations**

1. Coconut Development Board, Mahatma Gandhi Road, Ernakulam, Cochin - 682011 (Kerala)
2. National Cooperative Development Corporation, 4, Siri Fort Institutional Area, New Delhi.
3. National Oilseeds and Vegetable Oils Development Board, 86, Sector - 18, Gurgaon - 122001 (Haryana). (Ph.No.91-343181)
4. National Horticulture Board, 85, Sector - 18, Institutional Area, Gurgaon - 122001 (Haryana) (Ph.No.91-342990)
5. Small Farmers Agri-Business Consortium (SFAC),4th Floor, PHD House, Siri Fort Institutional Area, Hauz Khas, New Delhi - 110016.

6. National Institute of Agricultural Marketing, Kota Road, Bambala, (Near Sanganer), Jaipur
7. National Institute for Agricultural Extn. Management (MANAGE), Rajendranagar, Hyderabad-500030.

#### **f. National level cooperative organisations**

1. National Cooperative Union Of India, 3, Siri Institutional Area, Khelgaon Marg, New Delhi - 110016. (Ph.No. 6512750)
2. National Agricultural Cooperative Marketing Federation of India Ltd., NAFED House, Sidhartha Enclave, Ashram Chowk, New Delhi. (Ph.No.6831807)
3. National Federation of Cooperative Sugar Factories Ltd., Ansal Plaza, Block C, 2nd Floor, Khelgaon Marg, New Delhi-110049.
4. National Heavy Engineering Cooperative Ltd., 16, Mahatma Gandhi Road, Pune-400001 (Maharashtra) (Ph.No.660507)
5. National Federation of Urban Cooperative Bank and Credit Society Ltd., B-14, 3<sup>rd</sup> Floor, Naraina Shopping Complex, Naraina Vihar, New Delhi - 110028.
6. The All India Federation of Cooperative Spinning Mills Ltd., Canada Building,2nd Floor, 266- D.N.Road, Mumbai- 400001(Ph.No.2040995)
7. National Cooperative Agriculture and Rural Development Banks Federation, "Takshila" 2nd Floor, G.M. Pasta Road, Dadar(East), Mumbai-400014
8. National Federation of State Cooperative Banks Ltd.;J.K Chambers,5th Flor,Plot No.76,Sector-17.Vashi,Navi Mumbai-400703.
9. National Federation of Fishermen Cooperative Ltd.;7-A,Sarita Vihar Institutional Area, New Delhi-110044.
10. National Federation of Labour Cooperative Ltd.,Plot No.11 Sarita Vihar Institutional Area,Near Telephone Exchange, New Delhi-110044
11. National Cooperative Tobacco Grower's Federation Ltd. , Anand , Gujarat (Ph.No.22737)

## **II. Department of Agricultural Research And Education**

The Department of Agricultural Research and Education (DARE) has the following two autonomous bodies under its administrative control:

- Indian Council of Agricultural Research (ICAR)
- Central Agricultural University (CAU), Imphal

**a. ICAR Institutions, Deemed Universities, National Research Centres, National Bureaux & Directorate/Project Directorates****A. Deemed Universities - 4**

1. Indian Agricultural Research Institute, New Delhi
2. National Dairy Research Institute, Karnal
3. Indian Veterinary Research Institute, Izatnagar
4. Central Institute on Fisheries Education, Mumbai

**B. Institutions - 45**

1. Central Agricultural Research Institute, Port Blair
2. Central Arid Zone Research Institute, Jodhpur
3. Central Avian Research Institute, Izatnagar
4. Central Inland Fisheries Research Institute, Barrackpore
5. Central Institute Brackishwater Aquaculture, Chennai
6. Central Institute for Research on Buffaloes, Hissar
7. Central Institute for Research on Goats, Makhdoom
8. Central Institute of Agricultural Engineering, Bhopal
9. Central Institute of Arid Horticulture, Bikaner
10. Central Institute of Cotton Research, Nagpur
11. Central Institute of Fisheries Technology, Cochin
12. Central Institute of Freshwater Aquaculture, Bhubneshwar
13. Central Institute of Research on Cotton Technology, Mumbai
14. Central Institute of Sub Tropical Horticulture, Lucknow
15. Central Institute of Temperate Horticulture, Srinagar
16. Central Institute on Post harvest Engineering and Technology, Ludhiana
17. Central Marine Fisheries Research Institute, Kochi
18. Central Plantation Crops Research Institute, Kasargod

19. Central Potato Research Institute, Shimla
20. Central Research Institute for Jute and Allied Fibres, Barrackpore
21. Central Research Institute of Dryland Agriculture, Hyderabad
22. Central Rice Research Institute, Cuttack
23. Central Sheep and Wool Research Institute, Avikanagar, Rajasthan
24. Central Soil and Water Conservation Research & Training Institute, Dehradun
25. Central Soil Salinity Research Institute, Karnal
26. Central Tobacco Research Institute, Rajahmundry
27. Central Tuber Crops Research Institute, Trivandrum
28. ICAR Research Complex for Eastern Region including Centre of Makhana, Patna
29. ICAR Research Complex for NEH Region, Barapani
30. ICAR Research Complex Goa
31. Indian Agricultural Statistical Research Institute, New Delhi
32. Indian Grassland and Fodder Research Institute, Jhansi
33. Indian Institute of Horticultural Research, Bangalore
34. Indian Institute of Natural Resins and Gums, Ranchi
35. Indian Institute of Pulses Research, Kanpur
36. Indian Institute of Soil Sciences, Bhopal
37. Indian Institute of Spices Research, Calicut
38. Indian Institute of Sugarcane Research, Lucknow
39. Indian Institute of Vegetable Research, Varanasi
40. National Academy of Agricultural Research & Management, Hyderabad
41. National Institute of Abiotic Stress Management, Malegaon, Maharashtra
42. National Institute of Animal Nutrition and Physiology, Bengaluru

43. National Institute of Research on Jute & Allied Fibre Technology, Kolkata
44. Sugarcane Breeding Institute, Coimbatore
45. Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora

**C. National Research Centres - 17**

1. National Centre for Agril. Economics & Policy Research, New Delhi
2. National Centre for Integrated Pest Management, New Delhi
3. National Research Centre for Agroforestry, Jhansi
4. National Research Centre for Banana, Trichi
5. National Research Centre for Citrus, Nagpur
6. National Research Centre for Grapes, Pune
7. National Research Centre for Litchi, Muzaffarpur
8. National Research Centre for Pomegranate, Solapur
9. National Research Centre on Camel, Bikaner
10. National Research Centre on Equines, Hisar
11. National Research Centre on Meat, Hyderabad
12. National Research Centre on Mithun, Medziphema, Nagaland
13. National Research Centre on Orchids, Pakyong, Sikkim
14. National Research Centre on Pig, Guwahati
15. National Research Centre on Plant Biotechnology, New Delhi
16. National Research Centre Seed Spices, Ajmer
17. National Research Centre on Yak, West Kemang

**D. National Bureaux - 6**

1. National Bureau of Plant Genetics Resources, New Delhi
2. National Bureau of Agriculturally Important Micro-organisms, Mau, Pradesh
3. National Bureau of Agriculturally Important Insects, Bangalore

4. National Bureau of Soil Survey and Land Use Planning, Nagpur
5. National Bureau of Animal Genetic Resources, Karnal
6. National Bureau of Fish Genetic Resources, Lucknow

**E. Directorates/Project Directorates - 25**

1. Directorate of Maize Research, New Delhi.
2. Directorate of Rice Research, Hyderabad
3. Directorate of Wheat Research, Karnal
4. Directorate of Oilseed Research, Hyderabad
5. Directorate of Seed Research, Mau
6. Directorate of Sorghum Research, Hyderabad
7. Directorate of Groundnut Research, Junagarh
8. Directorate of Soybean Research, Indore
9. Directorate of Rapeseed & Mustard Research, Bharatpur
10. Directorate of Mushroom Research, Solan
11. Directorate on Onion and Garlic Research, Pune
12. Directorate of Cashew Research, Puttur
13. Directorate of Oil Palm Research, Pedavegi, West Godawari
14. Directorate of Medicinal and Aromatic Plants Research, Anand
15. Directorate of Floriculture Research, Pusa, New Delhi
16. Project Directorate for Farming Systems Research, Modipuram
17. Directorate of Water Management Research, Bhubaneshwar
18. Directorate of Weed Science Research, Jabalpur
19. Project Directorate on Cattle, Meerut
20. Project Directorate on Foot & Mouth Disease, Mukteshwar
21. Project Directorate on Poultry, Hyderabad
22. Project Directorate on Animal Disease Monitoring and Surveillance, Hebbal, Bangalore

23. Directorate of Knowledge Management in Agriculture (DKMA), New Delhi
24. Directorate of Cold Water Fisheries Research, Bhimtal, Nainital
25. Directorate of Research on Women in Agriculture, Bhubaneshwar

### **III. Department of Animal Husbandry, Dairying and Fisheries**

#### **a. Animal Husbandry Division**

- Central Cattle Breeding Farm, P.O. Dhamrod, District Surat Gujarat
- Central Cattle Breeding Farm, Andesh Nagar, District Lakhimpur (UP).
- Central Cattle Breeding Farm, Similiguda, P.O. Sunabada (Koraput) Orissa.
- Central Cattle Breeding Farm, Suratgarh (Rajasthan).
- Central Cattle Breeding Farm, Chiplima, P.O. Basantpur, District Samalpur (Orissa).
- Central Cattle Breeding Farm, Avadi, Alamadhi (Chennai).
- Central Cattle Breeding Farm, P.O. Hessarghatta, Bangalore North.
- Central Frozen Semen Production and Training Institute, Hessarghatta, Bangalore North.
- Central Herd Registration Unit, W-15, Jagdish Colony, Rohtak (Haryana).
- Central Herd Registration Unit, W-34, G.N.M. Colony, Christian Ganj, Ajmer - 305 001.
- Central Herd Registration Unit, 10, Gautam Vihar, Cooperative Society Building, Usmanpura, Ahmedabad.
- Central Herd Registration Unit, Santhapat, Ongole 523 001, District Prakasam (A.P.).
- Regional Station for Forage Production & Demonstration, P.O. Netaji Subhash Sanitorium, Kalyani, Distt Nadia (W.Bengal).
- Regional Station for Forage Production & Demonstration, 48, Rajbagh (Extension) Srinagar (J&K).
- Regional Station for Forage Production & Demonstration, Suratgarh (Rajasthan).
- Regional Station for Forage Production & Demonstration, P.O. Textile Mill Hissar (Haryana).
- Regional Station for Forage Production & Demonstration, GA 128/2, Sector No. 30, Gandhinagar, (Gujarat).
- Regional Station For Forage Production & Demonstration, Avadi, Alamadhi, (Chennai)-600052.
- Regional Station for Forage Production & Demonstration, Mamidipally, Via Keshavagiri, Hyderabad - 500005.
- Central Fodder Seed Production Farm, Hessarghatta, Bangalore North.
- Animal Quarantine & Certification Service Station, Delhi -Gurgaon Road, Kapashera Village, New Delhi.
- Animal Quarantine & Certification Service Station, Velachery Main Road, P.O. Pallikarni Village, Chennai - 601 302.

- Animal Quarantine & Certification Service Station, Village Gopalpur, P.O. Gopalpur, Distt Choubis parganas (W Bengal).
- Animal Quarantine & Certification Service Station, Mumbai - 400 065.
- Central Sheep Breeding Farm, P.O. Box No. 10, Hissar - 125 001 (Haryana).
- Central Poultry Development Organization, Southern Region, Hessarghatta, Bangalore North.
- Central Poultry Development Organization, Eastern Region, Bhubaneshwar.
- Central Poultry Development Organization, Western Region, Aarey Milk Colony, Mumbai.
- Central Poultry Development Organization, Northern Region, Industrial Area Chandigarh.
- Random Sample Poultry Performance Testing Centre, 69/4, Urban Estate, Gurgaon (Haryana).

**b. Dairy Development Division**

- Delhi Milk Scheme, West Patel Nagar, New Delhi.

**Fisheries Division**

**c. Fisheries Division**

- Central Institute of Coastal Engineering For Fishery, Bangalore
- Central Institute of Fisheries Nautical and Engineering Training, Cochin.
- Integrated Fisheries Project, Cochin.
- Fisheries Survey of India, Mumbai.
- Aquaculture Authority, Chennai.

## W3C Guidelines for Accessibility

### **Guideline 1.1: Provide text alternatives for all non-text content**

#### **Success Criterion**

##### **1.1 LI SC1:**

For all non-text content that is used to convey information, text alternatives identify the non-text content and convey the same information. For multimedia, provide a text-alternative that identifies the multimedia.

##### **1.1 LI SC2:**

For functional non-text content, text alternatives serve the same purpose as the non-text content. If text alternatives can not serve the same purpose as the functional non-text content, text alternatives identify the purpose of the functional non-text content

##### **1.1 LI SC3:**

For non-text content that is intended to create a specific sensory experience, text alternatives at least identify the non-text content with a descriptive label.

##### **1.1 LI SC4:**

Non-text content that is not functional, is not used to convey information, and does not create a specific sensory experience is implemented such that it can be ignored by assistive technology.

##### **1.1 LI SC5:**

For live audio-only or live video-only content, text alternatives at least identify the purpose of the content with a descriptive label.

##### **1.1 L3 SC1:**

For prerecorded multimedia content, a combined transcript of captions and audio descriptions of video is available.

**Guideline 1.2:** Provide synchronized alternatives for multimedia.**Success Criterion****1.2 L1 SC1:**

Captions are provided for prerecorded multimedia.

**1.2 L1 SC2:**

Audio descriptions of video are provided for prerecorded multimedia

**1.2 L2 SC1:**

Real-time captions are provided for *live* multimedia.

**1.2 L3 SC1:**

Sign language interpretation is provided for multimedia

**1.2 L3 SC2:**

Extended audio descriptions of video are provided for prerecorded multimedia.

**1.2 L3 SC3:**

Audio descriptions of video are provided for live multimedia.

**Guideline 1.3:** Ensure that information, functionality, and structure can be separated from presentation.**Success Criterion****1.3 L1 SC1:**

Structures within the content can be programmatically determined.

**1.3 L1 SC2:**

When information is conveyed by color, the color can be programmatically determined or the information is also conveyed through another means that does not depend on the user's ability to differentiate colors.

**1.3 L2 SC1:**

Information that is conveyed by variations in [presentation](#) of text is also conveyed in text or the variations in presentation of text can be [programmatically determined](#).

**1.3 L2 SC2:**

Any information that is conveyed by color is visually evident when color is not available.

**1.3 L3 SC1:**

When content is arranged in a sequence that affects its meaning, that sequence can be [determined programmatically](#).

**Guideline 1.4:** Make it easy to distinguish foreground information from background images or sounds.

**Success Criterion****1.4 L1 SC1:**

Any text that is presented over a [background image](#), color, or text can be [programmatically determined](#).

**1.4 L2 SC1:**

Text and diagrams that are presented over a [background image](#), color, or text have a contrast greater than X1 where the whiter element is at least Y1 as measured by \_\_\_\_.

**1.4 L2 SC2:**

Text that is presented over a background pattern of lines which are within 500% +/- of the stem width of the characters or their serifs must have a contrast between the characters and the lines that is greater than X2, where the whiter element is at least Y2.

**1.4 L2 SC3:**

A mechanism is available to turn off background audio that plays automatically.

**1.4 L3 SC1:**

Text is not presented over any background (image, text, color or pattern), or if any background is present, the contrast between the text and the background is greater than X2.

#### **1.4 L3 SC2:**

Audio content does not contain background sounds or the background sounds are at least 20 decibels lower than the foreground audio content, with the exception of occasional sound effects.

#### **Guideline 2.1: Make all functionality operable via a keyboard interface.**

##### **Success Criterion**

#### **2.1 L1 SCI:**

All of the [functionality](#) of the content, where the functionality or its outcome can be described in a sentence, is operable through a [keyboard interface](#).

#### **2.1 L3 SCI:**

All [functionality](#) of the content is designed to be operated through a [keyboard interface](#).

#### **Guideline 2.2: Allow users to control time limits on their reading or interaction.**

##### **Success Criterion**

#### **2.2 L1 SCI:**

Content is designed so that time-outs are not an essential part of interaction, or at least one of the following is true for each time-out that is a function of the content:

- the user is allowed to deactivate the time-out or;
- the user is allowed to adjust the time-out over a wide range which is at least ten times the length of the default setting or;
- the user is warned before time expires, allowed to extend the time-out with a simple action (for example, "hit any key") and given at least 20 seconds to respond or;
- the time-out is an important part of a real-time event (for example, an auction), and no alternative to the time-out is possible or;
- the time-out is part of an [activity where timing is essential](#) (for example, competitive gaming or time-based testing) and time limits can not be extended further without invalidating the activity.

#### **2.2 L2 SCI:**

Content does not blink for more than 3 seconds, or a method is available to stop any blinking content in the delivery unit.

**2.2 L2 SC2:**

Moving or time-based content can be paused by the user.

**2.2 L3 SC1:**

Except for real-time events, timing is not an essential part of the event or activity presented by the content.

**2.2 L3 SC2:**

Non-emergency interruptions, such as the availability of updated content, can be postponed or suppressed by the user.

**2.2 L3 SC3:**

When an authenticated session has an inactivity timeout, the user can continue the activity without loss of data after re-authenticating.

**Guideline 2.3: Allow users to avoid content that could cause seizures due to photosensitivity.**

**Success Criterion**

**2.3 L1 SC1:**

Content that violates international health and safety standards for general flash or red flash is marked in a way that the user can avoid its appearance.

**2.3 L2 SC1:**

Content does not violate international health and safety standards for general flash or red flash.

**2.3 L3 SC1:**

Content does not violate international health and safety standards for spatial pattern thresholds or red flash.

**Guideline 2.4: Provide mechanisms to help users find content, orient themselves within it, and navigate through it.**

**Success Criterion****2.4 L1 SC1:**

Navigational features can be programmatically identified.

**2.4 L2 SC1:**

More than one way is available to locate content within a set of delivery units.

**2.4 L2 SC2:**

Blocks of content that are repeated on multiple perceivable units are implemented so that they can be bypassed.

**2.4 L2 SC3:**

Delivery units have descriptive titles

**2.4 L2 SC4:**

The destination of each programmatic reference to another delivery unit is identified through words or phrases that either occur in text or can be programmatically determined.

**2.4 L3 SC1:**

When a page or other delivery unit is navigated sequentially, elements receive focus in an order that follows relationships and sequences in the content.

**2.4 L3 SC2:**

Information about the user's location within a set of delivery units is available.

**Guideline 3.1: Make text content readable and understandable.****Success Criterion****3.1 L1 SC1:**

The primary natural language or languages of the delivery unit can be programmatically determined.

**3.1 L2 SC1:**

The natural language of each foreign passage or phrase in the content can be programmatically determined.

**3.1 L3 SC1:**

A mechanism is available for finding definitions for all words in text content.

**3.1 L3 SC2:**

A mechanism is available for identifying specific definitions of words used in an unusual or restricted way, including idioms and jargon.

**3.1 L3 SC3:**

A mechanism for finding the expanded form of acronyms and abbreviations is available.

**3.1 L3 SC4:**

Section titles are descriptive.

**3.1 L3 SC5:**

When text requires reading ability at or above the upper secondary education level, one or more of the following supplements is available:

- a. A text summary that requires reading ability no higher than primary education level.
- b. Graphical illustrations of concepts or processes that must be understood in order to use the content.
- c. A spoken version of the text content.

**Guideline 3.2: Make the placement and functionality of content predictable.****Success Criterion****3.2 L1 SC1:**

Any change of context is implemented in a manner that can be programmatically determined.

**3.2 L2 SC1:**

Components that are repeated on multiple [delivery units](#) within a set of delivery units occur in the same order each time they are repeated.

**3.2 L2 SC2:**

When any component receives focus, it does not cause a [change of context](#).

**3.2 L2 SC3:**

Changing the setting of any input field does not automatically cause a [change of context](#).

**3.2 L2 SC4:**

Components that have the same functionality in multiple [delivery units](#) within a set of delivery units are labeled consistently.

**3.2 L3 SC1:**

Graphical components that appear on multiple pages, including graphical [links](#), are associated with the same text equivalents wherever they appear.

**3.2 L3 SC2:**

[Changes of context](#) are initiated only by user action.

**Guideline 4.1: Use technologies according to specification.**

**Success Criterion**

**Guideline 4.2: Ensure that user interfaces are accessible or provide an accessible alternative(s)**

**Success Criterion**

**4.2 L1 SC1:**

If content does not meet all level 1 success criteria, then an alternate form is provided that does meet all level 1 success criteria.

**4.2 L1 SC2:**

Content using [baseline](#) technologies or non-baseline technologies, must meet the following criteria:

- a. Content that violates international health and safety standards for general flash or red flash is marked in a way that the user can avoid its appearance
- b. If the user can enter the content using the keyboard, then the user can exit the content using the keyboard.

**4.2 LI SC3:**

The role, state, and value can be [programmatically determined](#) for every user interface component of the web content that accepts input from the user or changes dynamically in response to user input or external events.

**4.2 LI SC4:**

The label of each user interface control that accepts input from the user can be [programmatically determined](#) and is explicitly associated with the control.

**4.2 LI SC5:**

The states and values of content that can be changed via the user interface can also be changed programmatically.

**4.2 LI SC6:**

Changes to content, structure, selection, focus, attributes, values, state, and relationships within the content can be [programmatically determined](#).

**4.2 L2 SC1:**

Accessibility conventions of the markup or programming language (API's or specific markup) are used.

**4.2 L3 SC1:**

Content implemented using technologies outside of [baseline](#) follows all WCAG requirements supported by the technology.

## Central Agricultural Portal – Home Page

## Central Agricultural Portal - Software Requirement Specifications

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