

**National e-Governance Programme (NeGP)
Agricultural Mission Mode Project (AMMP)**

Service-11:

**Providing Information on
Drought Relief and Management**

Software Services by
Agricultural Informatics Division
National Informatics Centre
Department of Electronics & Information Technology (DeitY)
Ministry of Communications & Information Technology
(Government of India)
New Delhi

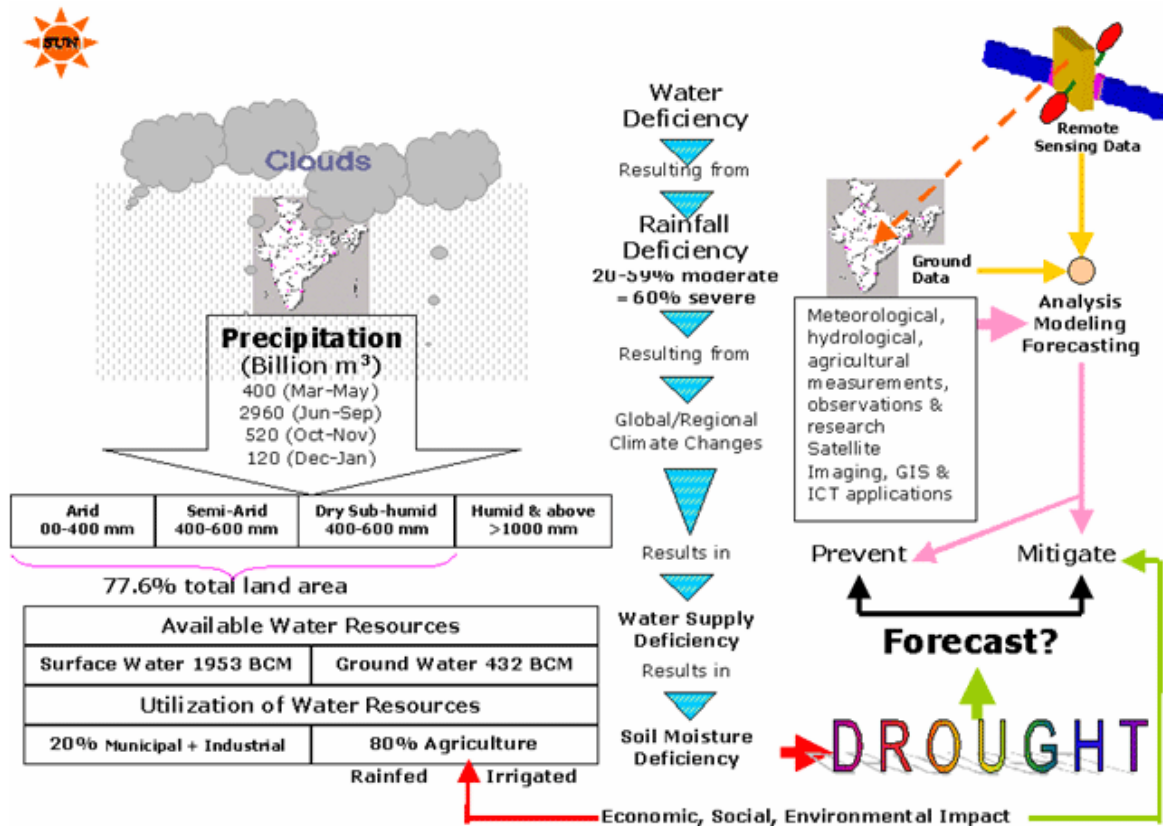
Agenda

- ▶ Understanding
- ▶ Scope of Service
- ▶ Solution (To-Be)
- ▶ Service Components
- ▶ Proposed Mechanism

Drought - Understanding

“A drought is an extended period of months or years when a region notes a deficiency in its water supply whether surface or underground water” , resulting in water shortage for vegetation, animals and human being.

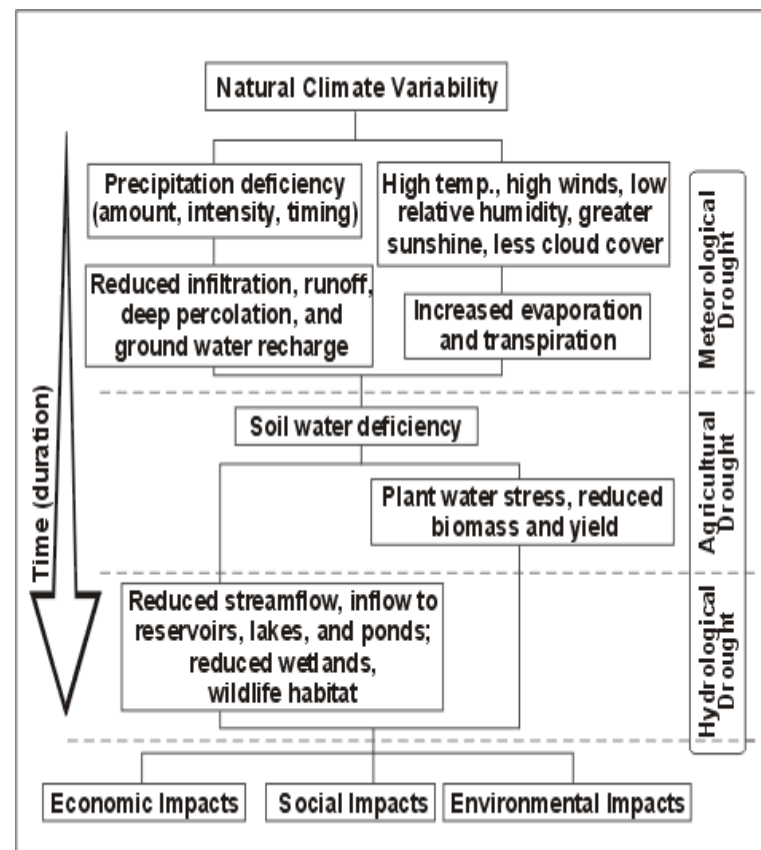
Drought



Source : DPR on Integrated Drought Management Information System, NIC Report 2009, submitted to DAC.

Drought – Classification

- 1. Meteorological Drought:** When there is prolonged period with less than average rainfall with reference to normal figures in a District. It usually precedes the other kinds of drought.
- 2. Agricultural Drought:** It is that affect crop production due to dry spells and uneven precipitation despite overall normal rains.
- 3. Hydrological Drought:** When there is serious depletion of ground water, decrease of water level in rivers, lakes and reservoirs resulting in scarcity of water for human and cattle consumption.



(Source: <http://www.drought.unl.edu/whatis/concept.htm>)

Drought occurrence is the product of inter-play between Meteorological, Agricultural and Hydrological conditions

Scope of Service - 11

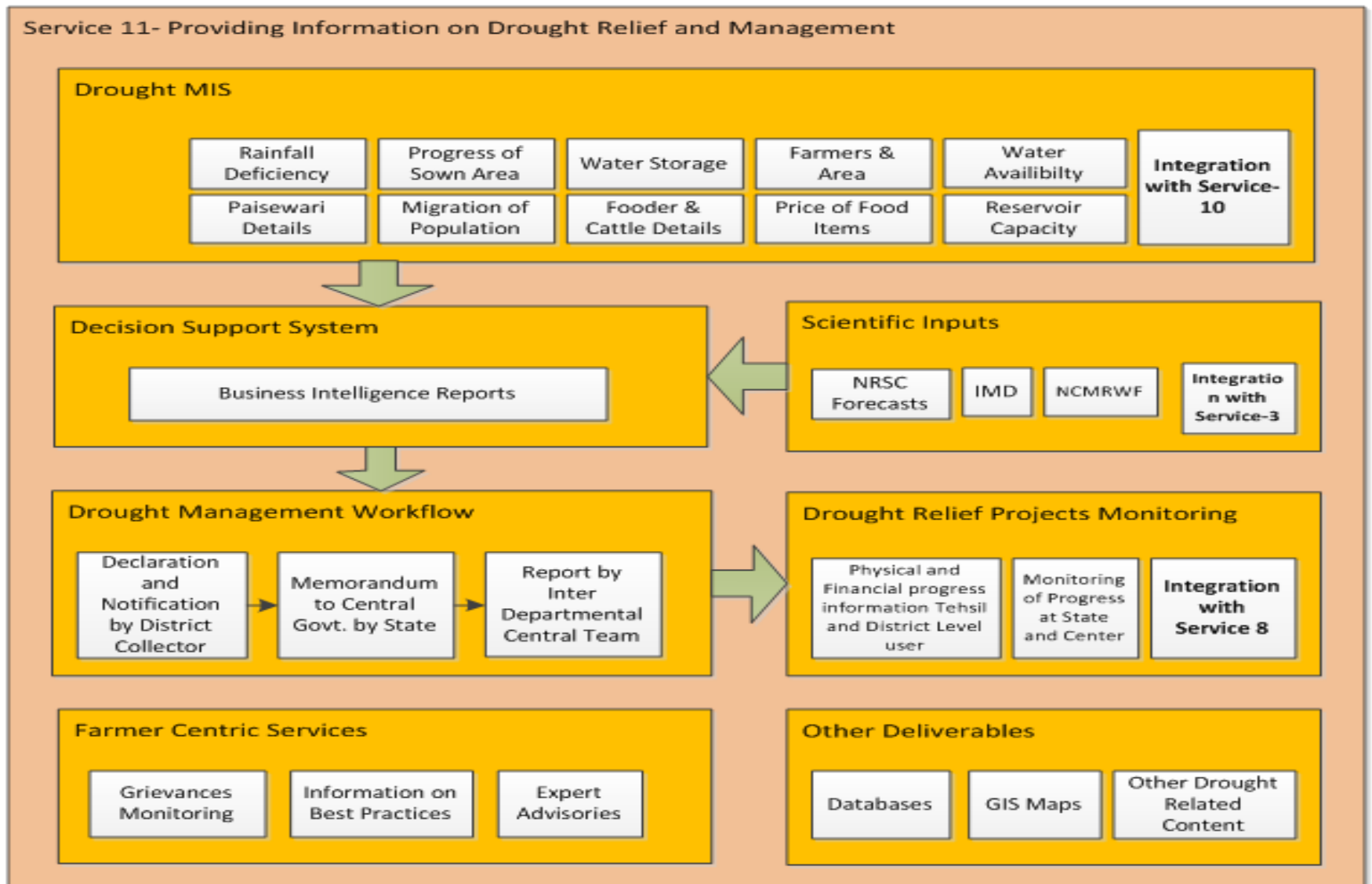
1. Up gradation of the existing Drought Management Information System (of DAC) to enable Tehsil/Block centric information flow (GIS enabled preferably) establishing linkages with Department of Space / ISRO / NRSC / SAC
2. Facilitate data entry (historic Data), even if there is no drought.
3. Development of online Templates
 - a. For submission of memorandum on drought relief under National Drought Relief Fund(NDRF) /National Calamity Contingency Fund (NCCF).
 - b. For submission of Central Team Report
4. Pre - and post-monsoon impact on crop sowing, Crops-harvesting, Crop growing , livestock, poultry, fisheries etc. (Nodal Institution to provide information)

Scope of Service – 11 (Cont'd)

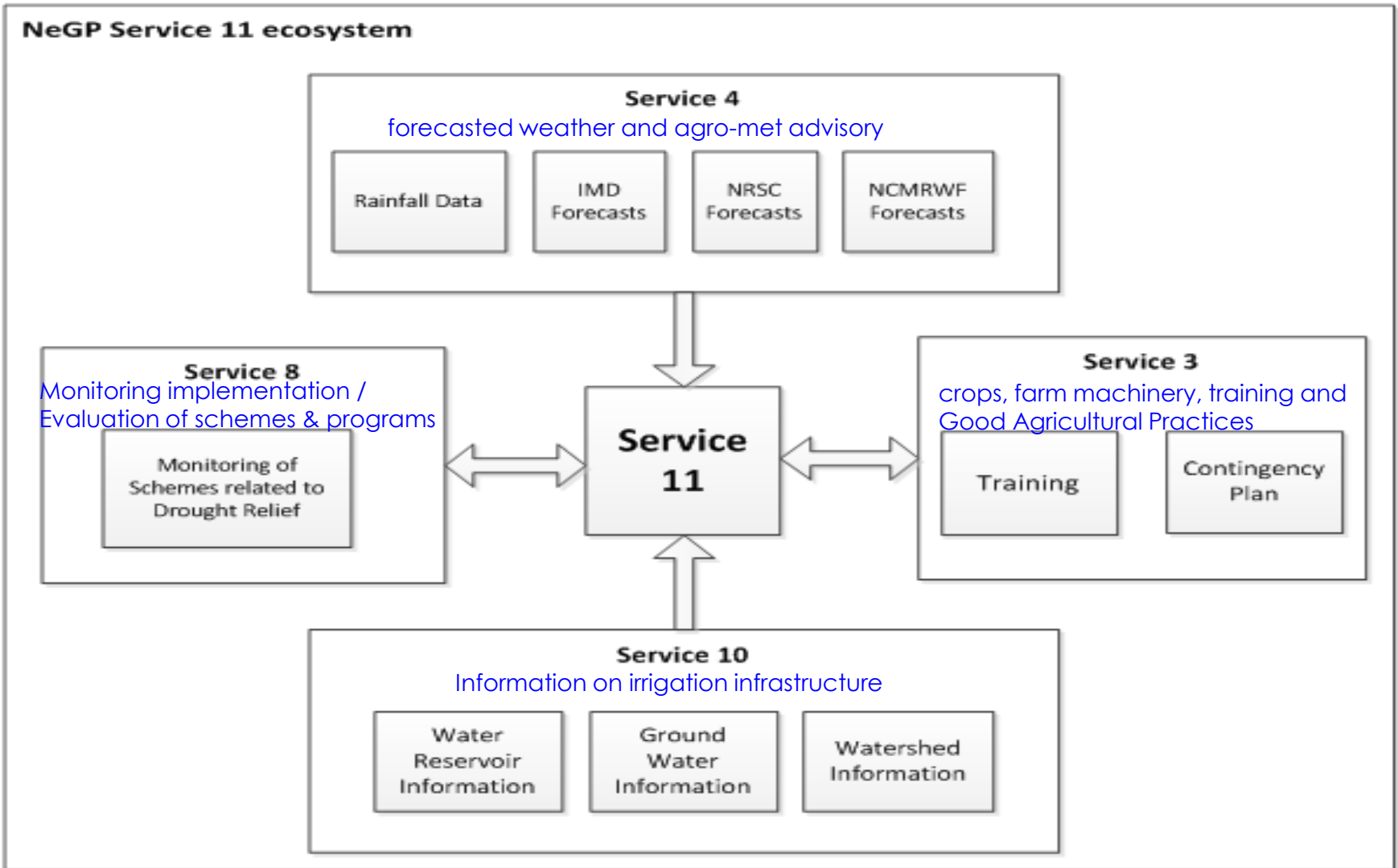
5. Providing Information on Past / Present Trends and Management (Inputs from State Agricultural Departments (Agriculture, Livestock, Fisheries etc), India Meteorological Department, State Agricultural Universities, CRIDA (ICAR), etc.)
6. Grievance Management and Redressal through multiple channels to farmers – Kisan Call Centre Services (1800-180-1551) to be augmented for this service
7. Expert Advisory on Cattle camps/Drinking Water/ Fodders and Others (in the event of drought situation) – based on Guidelines published by both State Livestock and Central Government Livestock Departments
8. Decision Support System (Tools) for making recommendations

Solution (To-Be)

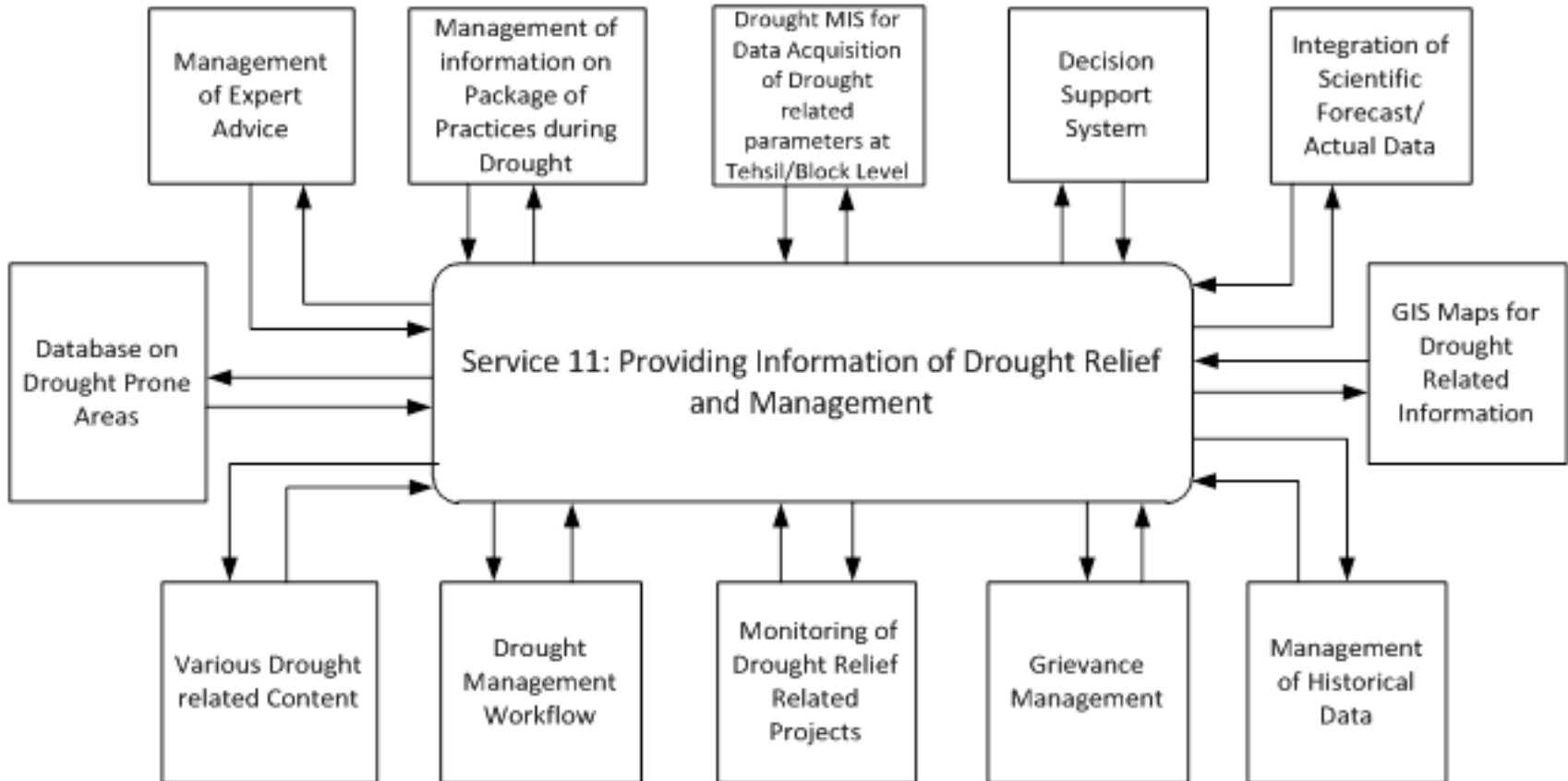
Solution (To-Be) - Functional Map



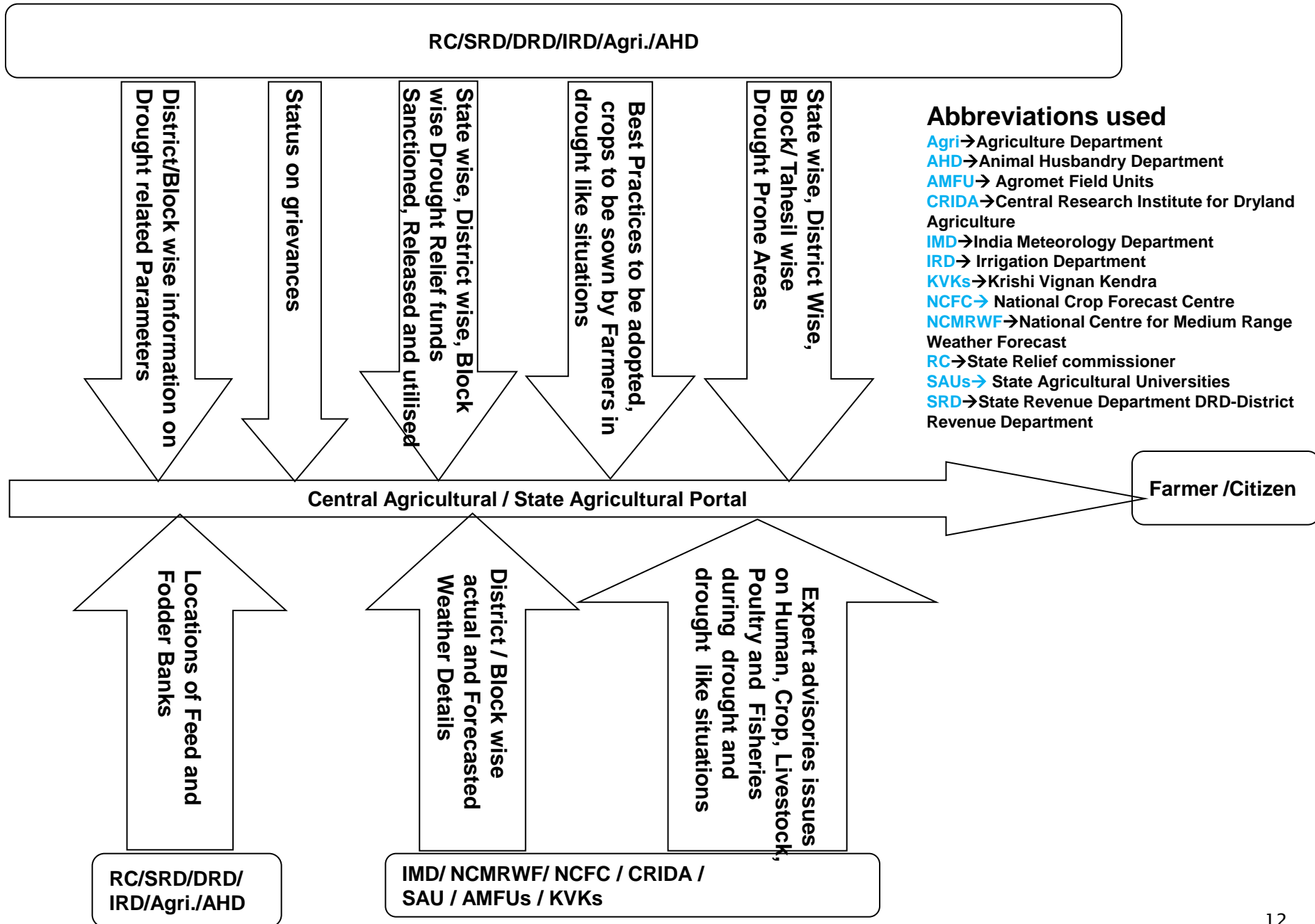
NeGP-A Service 11- Ecosystem



System Context



Service to Farmer Linkage



Abbreviations used

- Agri→Agriculture Department
- AHD→Animal Husbandry Department
- AMFU→ Agromet Field Units
- CRIDA→Central Research Institute for Dryland Agriculture
- IMD→India Meteorology Department
- IRD→ Irrigation Department
- KVKs→Krishi Vignan Kendra
- NCFC→ National Crop Forecast Centre
- NCMRWF→National Centre for Medium Range Weather Forecast
- RC→State Relief commissioner
- SAUs→ State Agricultural Universities
- SRD→State Revenue Department DRD-District Revenue Department

Service Components (To-Be)

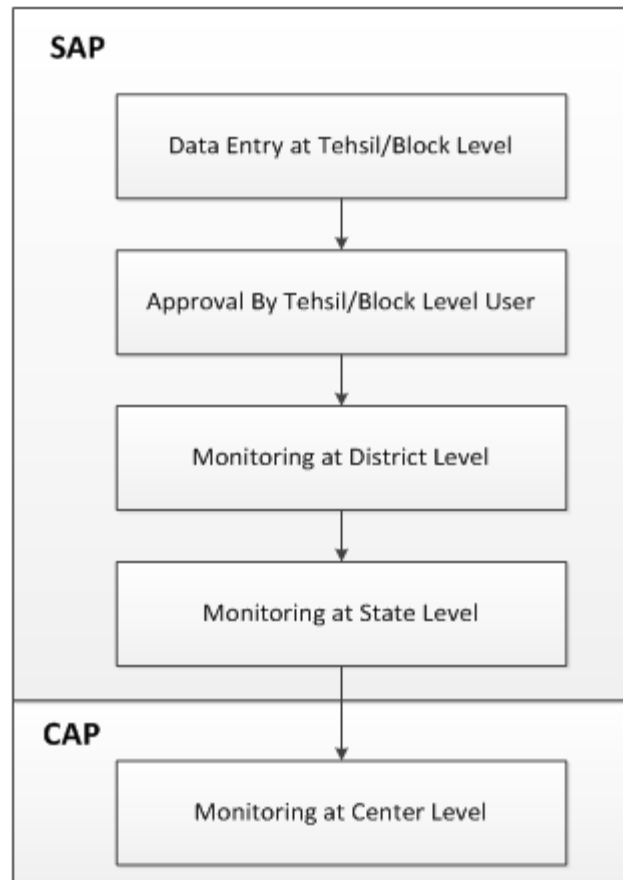
Service Components

- ▶ Drought MIS
- ▶ Drought Management Workflow
- ▶ Monitoring of Drought Relief Related Projects
- ▶ Management of Resources
- ▶ Decision Support System
- ▶ Grievance Management
- ▶ GIS based Expert Advisory System on Drinking Water, Feed and Fodder Availability for Cattle Camps (location-specific).

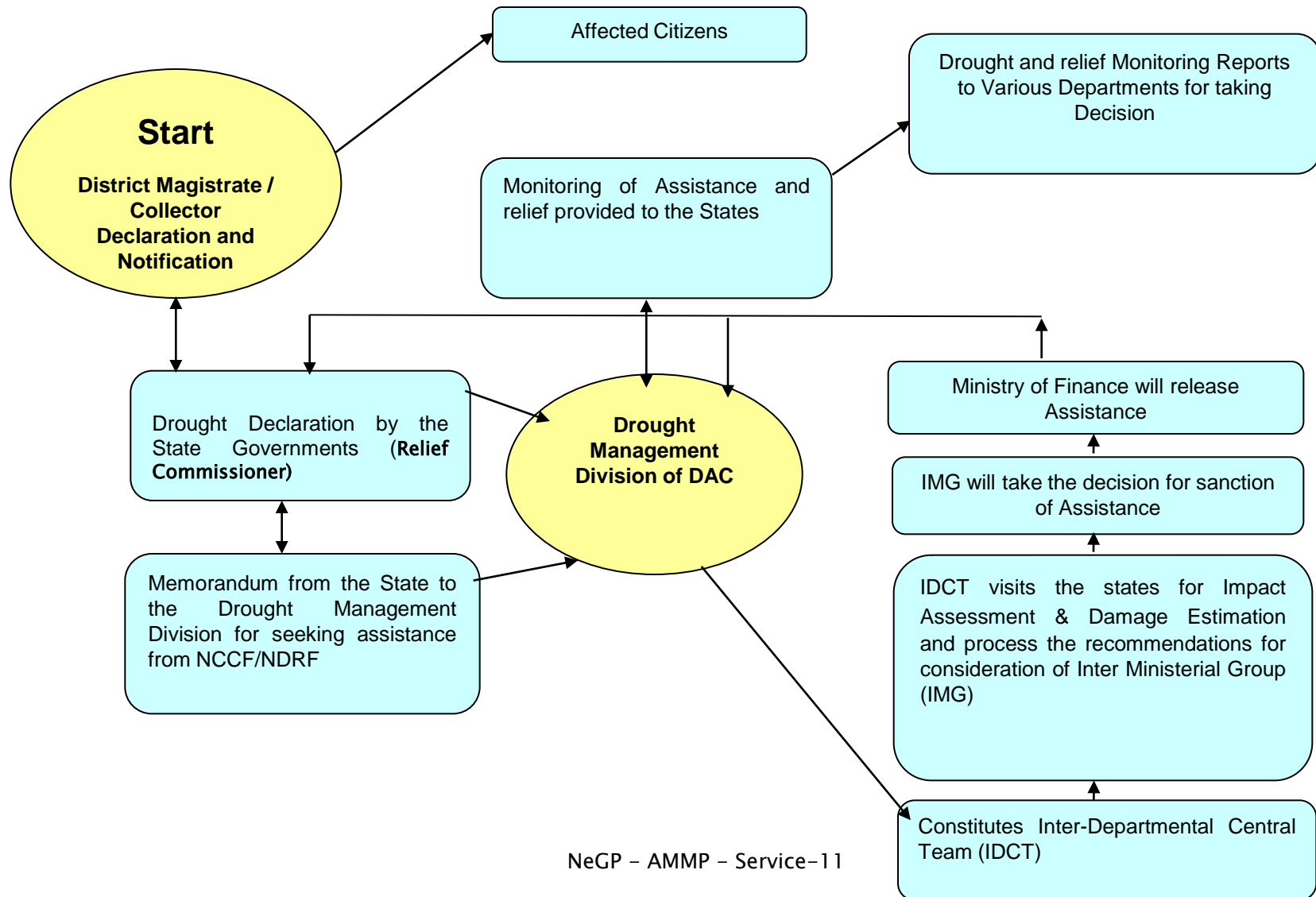
Drought MIS

- ▶ Drought Related Data Capture at Tehsil/Block Level
- ▶ Approval and Submission
- ▶ Reports
- ▶ Monitoring and Alerts
- ▶ Role based Access

Drought MIS – Application Flow



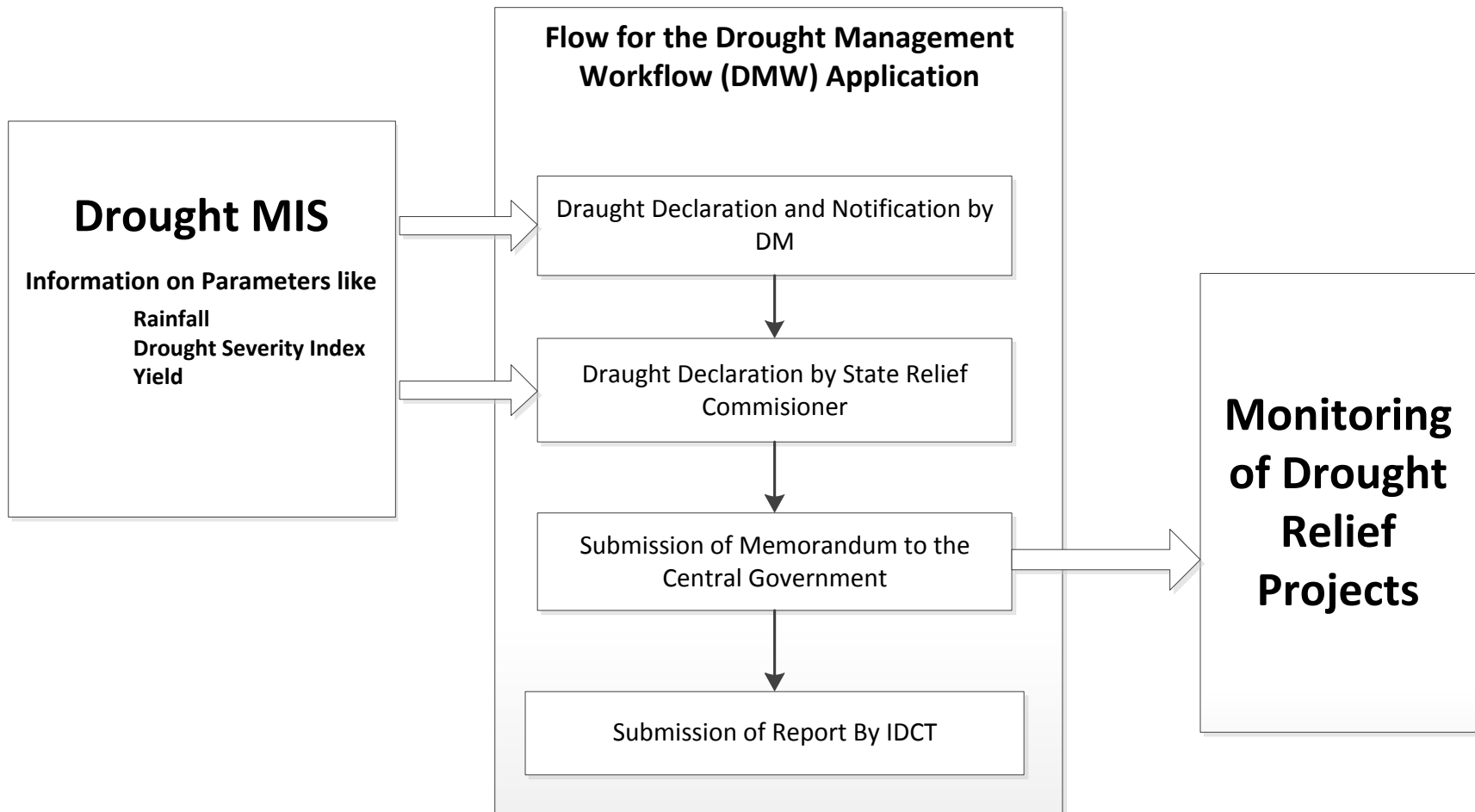
Information Flow for Drought Memorandum and Release for Relief Assistance (workflow based application)



Drought Management Workflow

- ▶ Drought Declaration by District Collector
- ▶ Drought Declaration by State Relief Commissioner/Secretary Disaster Management
- ▶ Submission of Memorandum for Drought Relief under National Calamity Contingency Fund (NCCF)
- ▶ Submission of Report By Inter-Departmental Central Team
- ▶ Generation of required certificates (i) Drought declaration by the District Collector/Deputy Commissioner (ii) Drought declaration by state relief commissioner/Secretary Disaster Management)
- ▶ Integration with Drought MIS (iii) Drought Notification by the District Collector

Drought Management Workflow



Monitoring of Drought Relief Projects (Integration with Service -8)

Monitoring of Drought Relief Projects are required to ensure

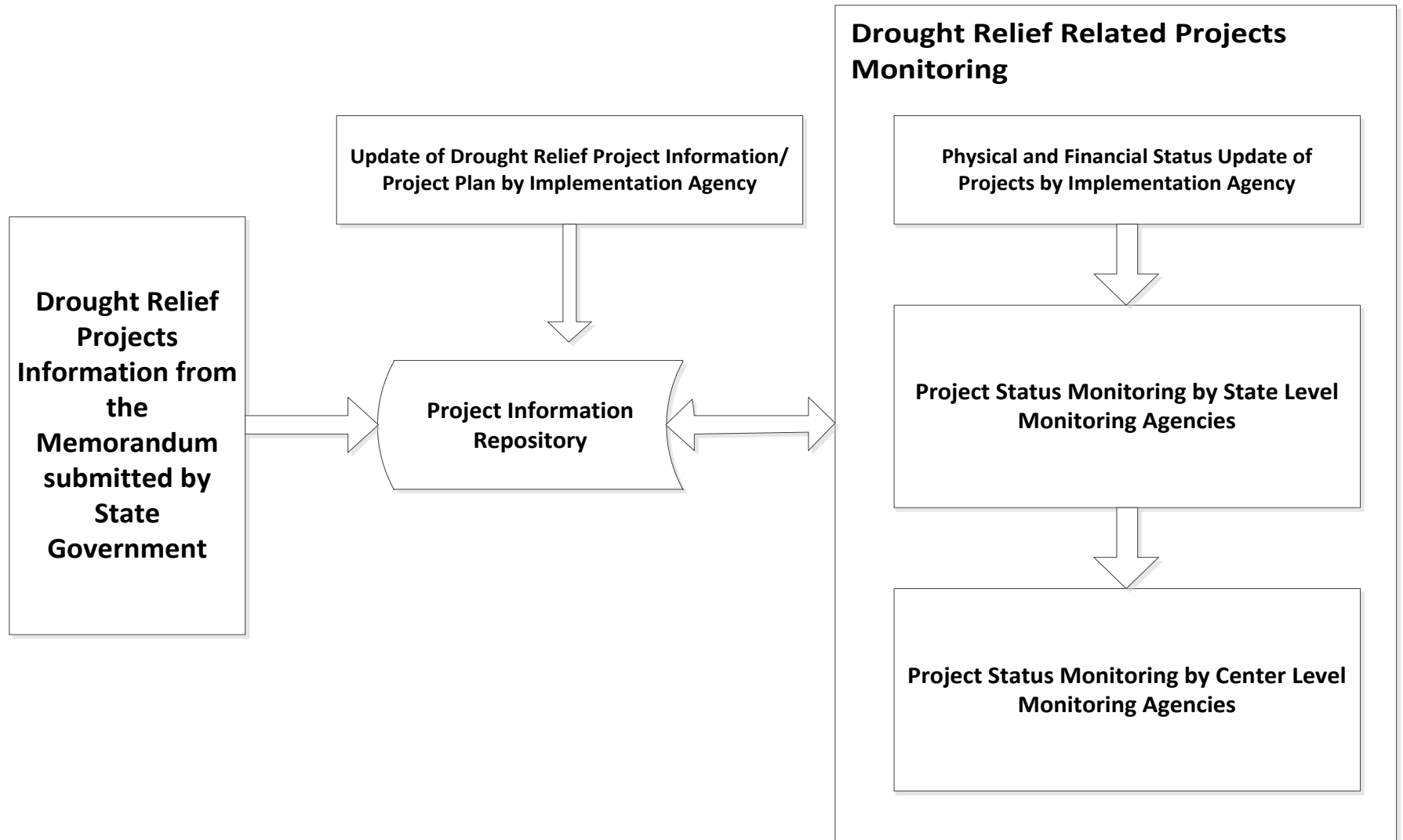
1. Health of Humans , Animals, Livestock and Fisheries
 2. The restriction of migration, unrest and strife
 3. Availability of food, fodder and water to human beings and animals
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- ▶ Integration with Drought Management Workflow for Project Plan submitted as part of Memorandum

 - ▶ Modification and Finalization of Project Plan

 - ▶ Status update for projects

 - ▶ Monitoring of Projects

Monitoring of Drought Relief Projects (Integration with Service -8) (Cont'd)



Management of Resources required for Drought Relief

- ▶ Master of resources required for drought relief
- ▶ Availability status of resources at different locations
- ▶ Requisition of resources
- ▶ Reports

Decision Support System

- ▶ Business Intelligence Tools to provide Decision Support Capabilities to support the users in analyzing the situation and take necessary mitigation measures.

Any of the following business Intelligence tools can be implemented, either independently or in conjunction for decision support systems and making recommendations .

- Microsoft SQL Server 2012 Suite along with SharePoint Server 2010 Enterprise
- Statistical Analysis System-Business Intelligence(SAS-BI)
- Oracle Hyperion

Decision Support System (Cont'd)

- ▶ Interactive tools to provide following capabilities for assessment of various drought related parameters (like Rainfall, Yield, Drought Severity Index etc.)
 - Time based Trends assessment
 - Year-on-Year
 - Rainfall analysis by day of the Season
 - Key Performance Indicators
 - Distribution of Drought Prone/affected areas by Drought Severity Index
- ▶ Capabilities to provide **Automatic Action and Advisory Triggers** based on the various drought related events like
 - Changes in drought severity index
 - Uneven Rainfall Distribution
 - Forecasts predicting scarcity in rainfall
 - Significant drop in yield

GIS Maps for Drought Related Information

The system should provide the GIS maps for the various drought related information. The following maps are required by the system:

- ▶ Drought Prone Areas
- ▶ Drought Declared areas
- ▶ Drought Vulnerability Map
- ▶ Rainfall deficiency
- ▶ Crop Sown Area
- ▶ Reservoir Capacity Details
- ▶ Crop Damages
- ▶ Relief Assistance Provided
- ▶ Soil Moisture
- ▶ Cropping Patterns
- ▶ Land Use Pattern
- ▶ Land Holdings

Content Management System

A Content Management System would be provided for the management of the following drought related content

- ▶ Drought Declaration Procedures
- ▶ Water harvesting procedures
- ▶ Drought resistance crops & their Varieties and methods of Irrigation
- ▶ Information on malnutrition or disease
- ▶ Crops covered under insurance and Crop insurance Procedures, eligibility criteria, agencies involved and all other related information
- ▶ Livestock insurance scheme details and insurance agencies
- ▶ Health related information and services for human and cattle (Source: Integrated Disease Surveillance System (IDSS), National Animal Disease Reporting System (NADRS))
- ▶ Information about fodder banks and cattle camps.
- ▶ Area wise Drought relief packages available and procedures for utilising the relief packages
- ▶ Credit facilities available

Other Service Components

- ▶ Package of best practices (from CRIDA /DAC/State Agricultural Departments/State Relief Commissioner/State Government may be District specific also) during drought
- ▶ Grievance Management & Redressal (Information System Component to be included)
- ▶ Expert Advisory Services on water restriction crops, water harvesting, nutrition food, human, animal, livestock and fisheries health etc.

Proposed Mechanism

- Data repository to be created with available information from all sources
- Historical Data to be used as input to the DSS tools for Trends and Predictive Analysis to generate Information and alerts
- Available data sources will be linked through web-services to the State/Central Agricultural Portal for Information delivery
- Impact Analytics on Crop / Livestock / Fisheries related to drought sensitive operations to mitigate drought based risk on crop cultivation / livestock / fisheries to be evolved
- The State Specific information as and when released by State Governments will be linked to State Agricultural Portal (SAP) and there-on to the Central Agricultural Portal (CAP)
- Various Delivery Channels will be used to disseminate the information
- Drought management Information System to be strengthened
- Various Online Templates to be developed

Thank You