



# G20 MACS Agricultural Technology Sharing Platform

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- Management Mechanism

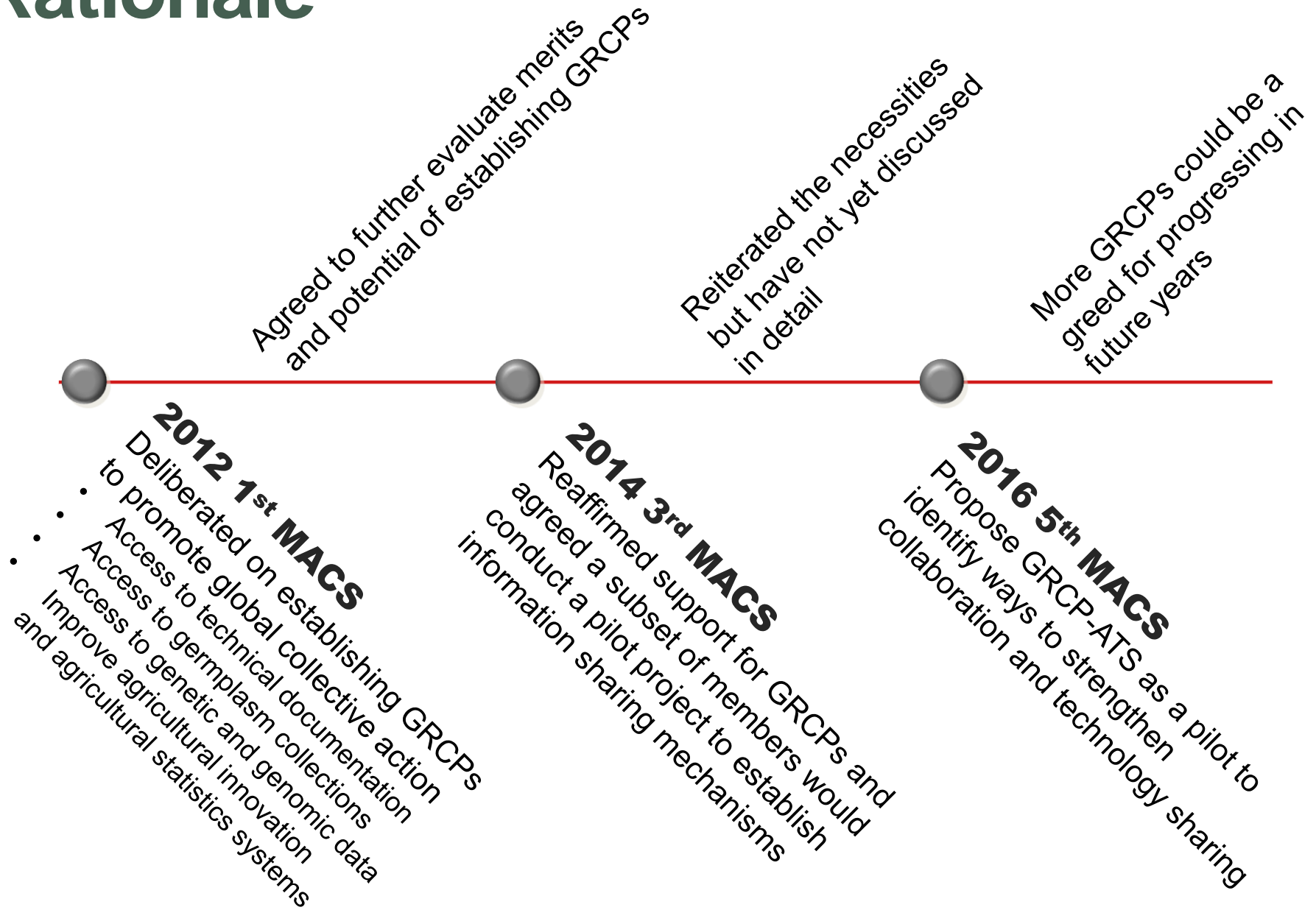
# **Part I**

## **Introduction of**

# **Agricultural Technology Sharing**

## **(ATS)**

# Rationale



# Agricultural Technology Sharing (ATS)

- We need cooperation, collaboration and partnership to meet global challenges for eliminating poverty and hunger faced today such as climate change, environmental degradation, desertification and threat of spread of epidemic diseases and pests.
- Is it easy to find which country has technologies for these agricultural challenges among mountains of the platforms ? Unless you are an expert in that field.
- There are specialized platforms targeted at different specific audiences, but there's need to serve ordinary users of these technologies, such as smallholder farmers, entrepreneurs, private sectors, with a user friendly, integrated technology information platform to:

COLLABORATE  
COOPERATE  
EXCHANGE  
SHARE

For Rapid Agricultural Innovation

That is why we need....

# Agricultural Technology Sharing Platform

## 5<sup>th</sup> G20 MACS Communiqué

14. .... *We agree to set up a working group on Agricultural Technology Sharing (ATS) led by China to map and analyze strengths and weaknesses of existing knowledge and information sharing mechanisms .....*

# Objectives

- Promote MACS cooperation mechanism:
  - To provide a platform for G20 members, interested countries, international organizations and other agencies to share data, information and knowledge;
  - To provide easy and efficient way for users such as farmers, researchers, policy makers and entrepreneur to access to agricultural technologies, facilitate technology support, share experience in skills for sustainable agriculture development;
  - To construct sources of information ready for cross-search and integration of specific problems;
  - To provide basis for exploring solutions for global issues through data mining;
  - To bring in regulatory mechanisms for data and information sharing, and enhancing cooperation of various stakeholders.

## **Part II**

# **Progress of ATS Working Group**

# Developing ATS Platform Procedure

Concept Paper as accepted by 5<sup>th</sup> G20 MACS at Xian



Constitution of the Working Group



Needs Analysis Survey by CAAS in consultation with the Working Group



Progress report to Meeting of G20 Agricultural Deputies Germany



Needs Analysis Survey responses and analysis



Conceptual Model of the Agricultural Technology Sharing Platform



Introduce ATS in G20 LOD Berlin Germany



Present ATS Platform in 6<sup>th</sup> G20 MACS Germany



Develop ATS Platform

# Concept Paper of ATS Working Group

- **Rationale**
- **Objectives**
- **Module and Content**
- **Organizational Mechanism**

- **Constitution**

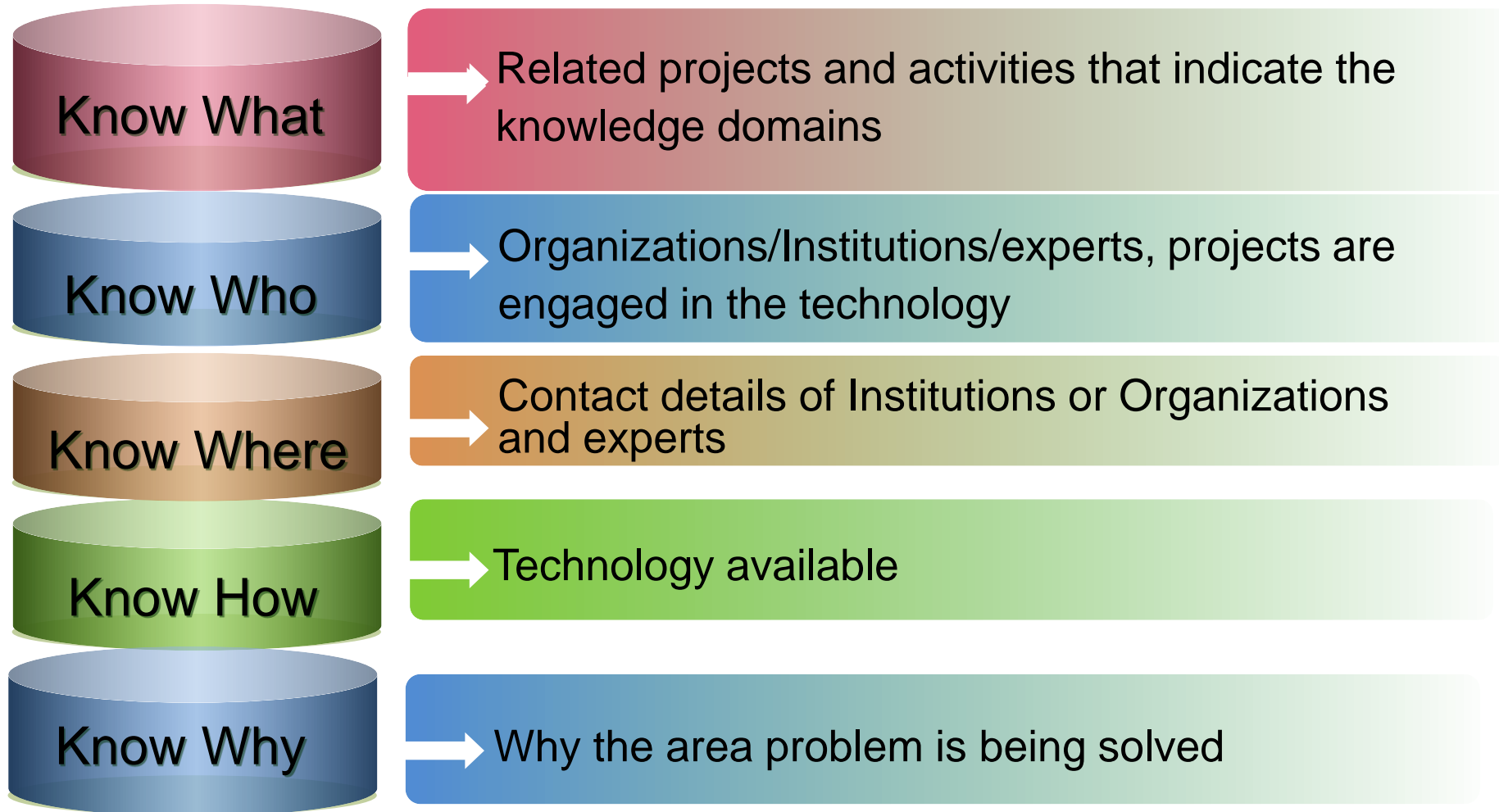
- 10 G20 members

Australia, China, Germany, India, Indonesia, Italy, Japan, Spain, Russian Federation, Republic of Korea


- 6 International Organizations

OECD, FAO, IFPRI, CABI, GFAR, GODAN

# Need Analysis Survey-Content



# Need Analysis Survey-Procedure



Needs Analysis Survey designed by the Working Group led by CAAS with support from GFAR, July-August 2016

CAAS Generated the questionnaire, August-September 2016

The questionnaire shared to the Working Group for comments and revision, 6 September -10 October 2016

Feedbacks received from Japan, Germany, and Spain and the questionnaire was revised and finalized, on 8 November 2016

The questionnaire was open to participants of 5<sup>th</sup> G20 MACS through SurveyMonkey, 9 -26 November 2016

22 Respondents , 15 from Heads of Delegations at the G20 5th MACs

The analysis conducted and completed, November 2016-30 March 2017

Comments and revisions received from the Working Group, May 2017

# Need Analysis-Know What

**Q: What are the key agricultural technologies areas that the ATS should focus on in providing information on collaboration, partnership, sharing and exchange**

S.No.	Information on Technologies	No. HOD Responses	HOD	No. Non-HOD responses	Non-HOD	Total responses	All
1	Technologies combatting Climate Change impacts on agriculture and environment	15	100.00 %	7	100%	22	100%
2	Technologies improving water conservation and use	12	80.00%	3	42.86%	15	68.18%
3	Technologies enabling sustainability and improving crop and farm productivity and incomes	13	86.67%	6	85.71%	19	86.36%
4	Technologies combatting desertification, land and environmental degradation and enabling rejuvenation	11	73.33%	3	42.86%	14	63.64%
5	Technologies preventing and managing impacts and transboundary spread of plant, animal and zoonotic diseases	13	86.76%	3	42.86%	16	72.73%
6	Technologies preventing loss of Agricultural Biodiversity	9	60.00%	2	28.57%	11	50.00%
	Total Survey Responses	15		7		22	

# Need Analysis-Know What

**Q: What are the key agricultural technologies areas that the ATS should focus on in providing information on collaboration, partnership, sharing and exchange**

S.No.	Information on Technology	Ranking by HODs	Ranking by others	Ranking by all
1	Climate Change	1	1	1
3	Sustainable Improvement of Crops and Incomes	2	2	2
5	Transboundary Diseases and Pests	2	3	3
2	Water Conservation and Use	4	3	4
4	Land degradation	5	3	5
6	Biodiversity	6	4	6

# Need Analysis-Know What

- The other key areas suggested by respondents were technologies:
  - that help manage and improve value addition chains, reduce and use waste and biomass from food and non-food products
  - that improve nutrition and food safety especially of the poor
  - for sustainable Intensification
  - plant (and animal) breeding technologies
  - that facilitate global trade in agricultural commodities and products
  - that enable resource poor especially women to participate in agribusiness
  - Innovations in technology mapping and dissemination
  - technologies that improve labor use efficiency

# Need Analysis-Know Who and where

- **Q: What information do agricultural stakeholders need for making decisions on collaboration, partnerships, sharing and exchange**

- Brief description of technologies and innovations developed in the key area, 19 out of 22 respondents
- Institutions/Organizations involved in the Key area, 19/22
- Brief Project Outputs and Technology developed, 17/22
- Contact details of the Organizations, 16/22
- Expert group/Experts involved in the key area, 16/22
- Contact details of Expert group, 13/22
- Respective funding projects undertaken in the Key area, 12/22
- Bibliography on the project, 8/ 22

# Need Analysis-Know Why

- Q: What models should the Working Group consider for developing the framework for the ATS?
  - TECA (<http://teca.fao.org/>) that provides technologies and practices for small agricultural producers
  - Agropedia (<http://agropedia.iitk.ac.in/>) that provides “wiki” like consolidated information related to agriculture
  - Agris (<http://agris.fao.org/agris-search/index.do>) that provides agricultural science and technology information on published papers, data, statistics, and multimedia materials
  - CIARD.RING (<http://ring.ciard.info/>) which is a directory to information services and datasets in agriculture
  - Agriprofiles (<http://www.agriprofiles.net/>) which provides information that can contribute to collaboration and partnerships in agricultural research and innovation such as organizations, experts, projects and project outputs with bibliographies.

# Need Analysis-Know Why

- Gap Analysis of Current Models**

S.No.	Information	TECA	Agropedia	AGRIS	CIARD. RING	Agriprofiles
1	Brief Descriptions of Technology and Innovations	Yes	Yes	No	(Keyword Tag)	Yes/?
2	Institutions Involved in Key Area	?	?	No	Yes	Yes
3	Brief Project Outputs			Yes	Yes	Yes
4	Contact Details of Organization	?	?	Yes	Yes/?	Yes
5	Experts Involved in Project/Key Area	?	Yes	Yes	Yes/?	Yes
6	Contact Details of Experts	?	?	Yes	Yes/?	Yes
7	Respective Funding Projects	?	?	No	No/?	Yes/?
8	Bibliography	?	Yes/?	Yes	Yes	Yes

# **Part III**

## **Plan for ATS Platform**

# Conceptual Model of ATS Platform

- Metadata Information
- Metadata Standards
- Metadata Storage
- Search Engine
- Data Management
- Interfaces

# Metadata Information

- The platform will include searchable information on:
  - Technologies descriptions organized on the basis of the ontological classification of Agrovoc
  - Description of Technologies with key documented references available country wise
  - Description of Technologies available organization wise in each country with the organizations contact details (address, web URL etc)
  - Description of Technologies as per expert ,organization wise and country wise with Contact Details

# Metadata Standards

- **Development of Metadata Standards for sharing, exchanging and integrating information on ATS platform**
  - Use metadata shared by country level databases that are managed by participating G20 and other countries and organisations contributing to the platform.
  - A set of internationally accepted metadata standards will be needed to share information at the platform level between distributed databases maintained by countries and organizations.
  - The ATS Working Group and other International Institutions and Experts will develop the Metadata standard for the ATS platform that will be shared publicly.

# Metadata Storage

- A registry on an Internet Cloud which can with appropriate cyber-safety be accessed universally
- The Meta database or registry will be open data shared through a general creative commons license
- China offers to develop, facilitate and manage the ATS Platform Cloud

# Search Engine

- **ATS Platform Search Engine Development**
- A unique search engine that can search the distributed databases managed by individual countries and organization at their levels
- Use the metadata and provide outputs through a Web based and App based interface
- China offers facilitation of the development of ATS Platform Search engine
- The algorithm of the search engine will be protected by a delegated committee of G20 MACS and appropriately protected

# Data Management

- FAIR principles for ATS data management
- ☐ Findable
  - F1. (meta)data are assigned a globally unique and eternally persistent identifier.
  - F2. data are described with rich metadata.
  - F3. (meta)data are registered or indexed in a searchable resource.
  - F4. metadata specify the data identifier.
- ☐ Accessible
  - A1 (meta)data are retrievable by their identifier using a standardized communications protocol.
    - A1.1 the protocol is open, free, and universally implementable.
    - A1.2 the protocol allows for an authentication and authorization procedure, where necessary.
  - A2 metadata are accessible, even when the data are no longer available.

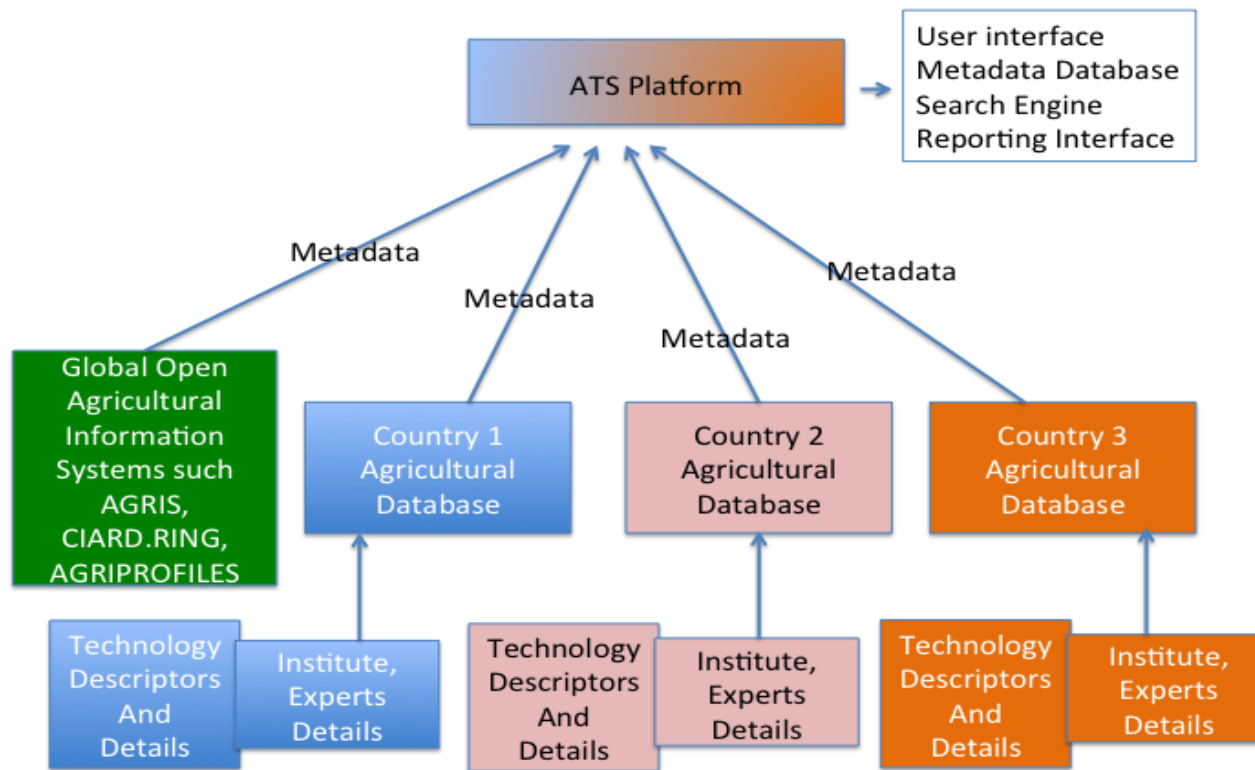
# Data Management

- FAIR principles for ATS data management
- Interoperable
  - I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
  - I2. (meta)data use vocabularies that follow FAIR principles.
  - I3. (meta)data include qualified references to other (meta)data.
- Reusable
  - R1. meta(data) have a plurality of accurate and relevant attributes.
  - R1.1. (meta)data are released with a clear and accessible data usage license.
  - R1.2. (meta)data are associated with their provenance.
  - R1.3. (meta)data meet domain-relevant community standards.

# Interfaces

- **Two specific interfaces**
- Input of details for the metadata of databases being shared by the country or organization
- Output of the search engine providing the desired information according to technology descriptor. The technology descriptors, country, organization and expert level information will be integrated and inter-related enabling searches to be made by technology, country, organization and/or expert individually or in combination
- The Interface will be developed concurrently along with the Standards and Search Engine as an entire ATS platform in close consultation with a group of experts delegated the G20 MACS working Group

# Schema of ATS Platform



# Application Scenario Demonstration



**Users (Government ,Enterprises ,Smallholders ,Researchers)**

**Requirements**

**Crop Technology and Knowledge (e.g. Corn)  
(Knowledge ,Technology Transfer)**

**Search & Browsing**



**Semantic Info.& Knowledge Organization**

**Big Data Governance & Analysis**



**Governments**

**Scientists**

**NGOs**

**Farmers  
Other Info. Providers**

# Features

- Enable differently constructed sources of information to be seamlessly integrated, so that they can be searched to respond to queries by stakeholders and use such knowledge to acquire and enable successful agricultural practices be innovated and adapted to the local context and needs
- Act as a directory of shared information collated by partnering countries and representative organizations. The countries and organizations will themselves collate and store such information in each country, retaining all rights to the information provided
- Consolidated standards for sharing and exchange of agricultural data, information and technology, a unique search engine for metadata and distributed databases will be developed with appropriate input and output interfaces for the platform

# Organizational Mechanism

- Working Group from G20 countries and international organizations for regular joint work
- Collaboration with G20 members and GFAR, FAO, GODAN, IFPRI, etc.
- Reporting to G20 MACS regularly
- Coordination base set in CAAS, China organize global consultation and communication events collaborating with G20 members and GFAR, FAO, GODAN, IFPRI, etc.

Thank you for your attention.

Comments and suggestions for ATS are appreciated.

Welcome to join ATS Working Group.

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