A reference space for information management standards, tools and methodologies: the AIMS portal

Authors: *Thembani Malapela∗, Imma Subirats∗, Sarah Dister∗, Karna Wegner∗ and Johannes, Keizer∗*

∗ *Food and Agriculture Organization of the United Nations*

Abstract: *The Agricultural Information Management Standards (AIMS) portal provides to information specialists in the agricultural domain good practices and methodologies on the management and dissemination of agricultural information by using widely accepted standards and methods. AIMS is a resource container where users can find experiences in applying semantic technologies and information standards to agricultural situations from related partnerships within (or for) the agricultural domain. AIMS is facilitated by the Food and Agricultural Organisation (FAO) of the United Nations with support from an external Consultative Group which provides feedback and guidance on technical improvements, outreach activities, new services, and strategic recommendations. This paper reviews the AIMS portal as a reference place for agricultural information management professionals with regard to standards, tools and methodologies for managing agricultural information and systems. It provides an overview of the AIMS portal content and the AIMS Community. Initiatives, such as the development and application of the AGROVOC Linked Open Data (LOD), Linked Open Data Enabled Bibliographic Recommendations (LODE-BD) or OpenAGRIS, are some of the products that are of interest to the agricultural information management community. The paper concludes with a sample re-enactment of how access to the AIMS portal may help an information management specialist to solve an archetype information management scenario.*

1. Introduction

The Web has evolved in recent years more into the Semantic Web acting as an infrastructure for disseminating research outputs. In this context, research organizations strive to improve integration, retrieval, and re-use of their information through investing in the development and use of complex knowledge structures such as taxonomies and ontologies. These structures support the exposition of research outputs as Linked Data and strive to integrate and link research data with other research outputs.

Information management professionals whose *raison d'être* is to facilitate access and retrieval of research outputs have seen potential in promoting systems interoperability, structured knowledge organization systems and thereby facilitating information re-use. The sharing of experiences and knowledge amongst professionals has never been more important than now. Donatella *et al.,*[1] acknowledged that online participatory platforms enable virtual communities to interact deriving further advantages of sharing, learning and leveraging experiences. This paper will review the AIMS portal's role is providing the agricultural information management specialists with the resources on good practices and methodologies on agricultural information management standards, tools and services and will describe the AIMS community around these areas.

2. Agricultural Information Management Standards portal

The AIMS portal provides information resources to agricultural organizations in attaining openness to research outputs. AIMS content is grouped around vocabularies, metadata, information management tools and linked data themes. In this regard, the AIMS portal seeks to advocate for the application and use of semantic technologies and standards; to promote the interoperability of agricultural information and systems; and to offer recommendations on managing research outputs.While AIMS is facilitated by FAO, it receives support from the AIMS Consultative

group – a stakeholder group that provides recommendations for the improvement and long term development of the platform. The AIMS consultative group offers recommendations through online consultations, and regularly through the AIMS Consultative Group.

Partnerships and collaborations have been established with key agricultural institutions in the area of information management to provide information management standards and tools. AIMS portal can be defined as a twofold platform: firstly, it is a resource container providing information on agricultural information management standards, tools and methodologies. Secondly, it is an active community of practice that is currently hosting ten groups of interest. In this way, AIMS is able to disseminate good practices in agricultural information management; to consolidate a community of practice centred on interoperability and reusability of agricultural outputs and to contribute to the implementation of structured and linked information to enable institutions to share easily agricultural research information.
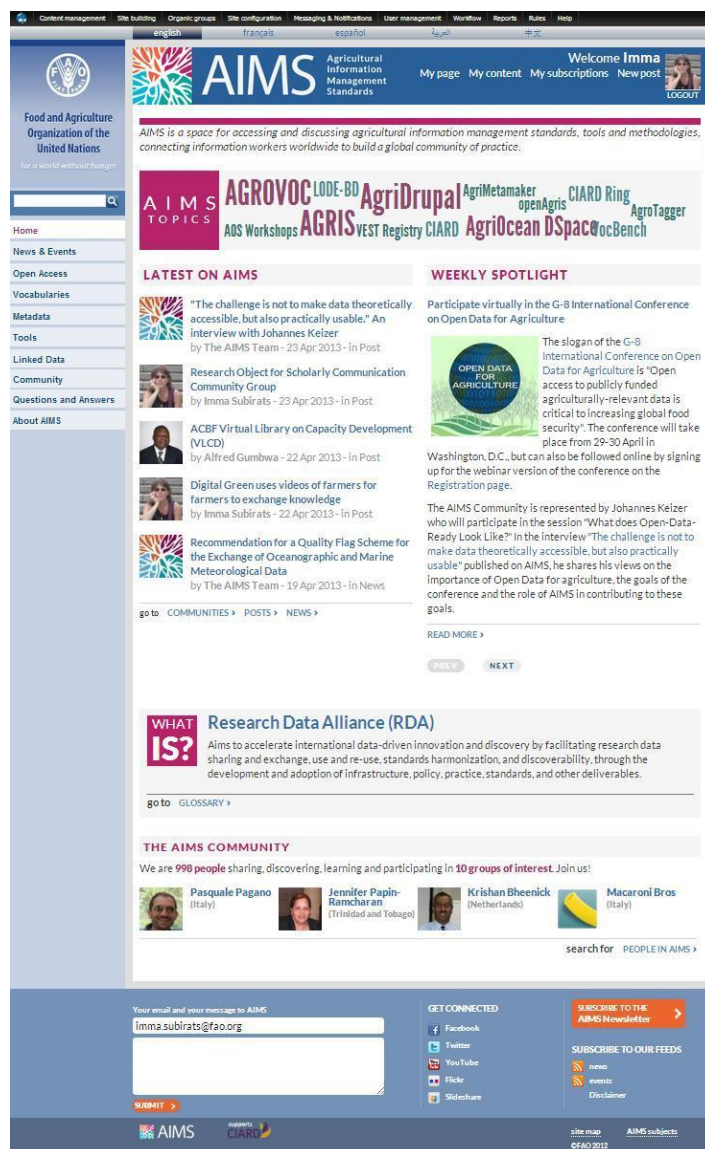

Figure 1. The AIMS Portal Homepage

3. Information resources available on AIMS

The goal of AIMS is to enable that agricultural research outputs become available freely and openly accessible to the global agricultural research organizations for re-use and further igniting scientific inquiry and discovery. Institutions at various technological developments find AIMS portal resources relevant for their local needs. The following two points influence the recommendations available on AIMS portal. Firstly, AIMS provides recommendations on the widely used metadata standards. For example the *Meaningful Bibliographic Metadata (M2B[1])* recommendations are intended to assist content providers in selecting appropriate metadata properties for the creation, management and exchange of meaningful bibliographic information in open repositories and information systems.

Secondly, AIMS encourage the use of controlled vocabularies to index information resources. In this regard, AGROVOC, curated by FAO in collaboration and support from an international community of experts, is provided with this objective. To date, AGROVOC has been used by a widely different type of information systems and entities, from agricultural libraries, digital libraries, to webmasters, or repositories amongst many of its uses. [3] Semantic technologies have enabled the web to be platform for sharing and accessing information. AGROVOC has been published as Linked Open Data and aligned to major controlled vocabularies in the agricultural domain such as NAL and ASFA thesaurus. Additionally it has been also linked to vocabularies in other domains like EUROVOC or the Library of Congress Subject Headings (LCSH). Therefore, information professionals that use AGROVOC to index information resources are enhancing interoperability, *findability* and '*retrievability*' of indexed resources.

---

[1] **Meaningful Bibliographic Metadata (M2B)** http://aims.fao.org/metadata/m2b Date accessed 21/04/2013

3.1 An overview of information resources available AIMS.

The information resources available on the AIMS platform comprises of information describing FAO's supported products and services, such as the AGROVOC, OpenAGRIS, AgriDrupal amongst others. Beyond this, AIMS portal exposes similar agricultural information management topics from related institutions and partner organisation in the agricultural domain. Information resources available on AIMS are grouped under the following themes:-

a) *Open Access*- AIMS promotes open access through providing methodologies and good practices that facilitate the availability of research outputs. In this way, AIMS supports the Coherence for Information for Agricultural Research for development (CIARD) - a movement working towards making available research information and knowledge . The Open Access section on AIMS, therefore, collects key open access reference materials useful for agricultural institutions to move to openness; open access case studies and selected Open Access mandates of key institutions in the agricultural domain.

b) *Vocabularies* – In this section, AIMS promotes vocabularies that facilitate the retrieval of content and indexing of information resources. Through the VEST Registry, AIMS further offers other types of vocabularies like authority files, classification systems, concept maps, controlled lists, ontologies, taxonomies or subject headings.

c) *Metadata* – Recommendations for the creation of quality metadata that facilitate the exchange of data and information through choosing the right metadata properties are available in this section. The Meaningful Bibliographic Metadata (M2B) recommendations and the Agricultural Metadata Element Set (AgMES) are its key products.

d) ***Information Management Tools*** – In order to encourage the publication and production of rich metadata, information management tools were customised to accommodate the use of vocabularies and metadata formats to enable these tools to expose rich metadata compliant with the OAI-PMH protocol. The examples for these customisations include: within the document management software – Dspace customized as AgriOcean DSpace, and within the Content Management Software (CMS), Drupal was published as AgriDrupal.

e) ***Linked Data-*** In order to support institutions towards the semantic web, the AIMS portal provides recommendations and products in the area of linked data. For instance, AGROVOC is published as linked data and the OpenAGRIS[2] as a means of interlinking and enriching the AGRIS database. Additionally users can access to the recommendations on how to select appropriate encoding strategies for producing

f) Linked Open Data (LOD)-enabled bibliographic data (LODE-BD)[3]. LODE-BD recommendations are applicable for structured data describing bibliographic resources such as articles, monographs, theses, conference papers, presentation materials, research reports, learning objects, etc. – in print or electronic format.

3.2 AIMS Services

AIMS also provides services that include the dissemination of news and events, organization of Webinars, information directories on metadata, tools and vocabularies in and outside agriculture, collection of case studies, and publication of interviews with key players in

the community. These services are essential to help leverage different user appreciation of information management standards and methodologies, and are also instrumental to facilitate sharing of experiences amongst community members worldwide. For example, with regard to online events, the AIMS team in conjunction with the Global Forum on Agricultural Research (GFAR), the Inter-American Institute for Cooperation on Agriculture (IICA) and the International Association of Agricultural Information Specialists (IAALD) jointly organized the 2012 Open Access Week@AIMS webinars. This was a series of webinars during the international open access week to commemorate the openness in agricultural research outputs. The theme of the webinars was Making Agricultural Research Information Publicly Available and Accessible.

4. AIMS Community of Practice (CoP)

AIMS is a global community on agricultural information management professionals. Its main function is to provide a space to exchange ideas, suggestions, questions, solutions around the core areas of information management standards, tools and methodologies. To participate in the AIMS community is open and free.

The AIMS community members are information professionals from all over the world with different technical backgrounds. These include (but are not limited to) librarians, information managers, publishers, information technology specialists, researchers, software developers, and students with an affiliation or interest to agriculture.

The AIMS community (which is currently around 1,400 registered users) hosts ten topic groups of interests. After the registration, every user can subscribe to a specific group. A list of all groups of interests and their brief descriptions are provided in figure 3 below. Only the AIMS Consultative Group, and the CIARD Content Management Task Force are restricted, the rest of the groups are by voluntary subscription.

---

[2] **OpenAGRIS**. http://aims.fao.org/openagris. Date accessed 07/05/2013
[3] **Linked Open Data (LOD)-enabled bibliographic data (LODE-BD)** http://aims.fao.org/lode/bd. Date accessed 15/05/2013

The groups of interest have been created to articulate the distribution of news and discussions around specific topics. In addition, those related to information management tools such as AgriOcean DSpace and AgriDrupal are used to get support from the community members when implementing and using tools.

Groups of Interest	Description	Members
AgriDrupal	To discuss new features and developments of AgriDrupal	251
AgriMetaMaker	To discuss and share experiences or troubleshoots using AgriMetaMaker	43
AgriOcean DSpace	To discuss the functionalities and development of AgriOcean DSpace	158
AGRIS Network	To collaborate and get involved in the AGRIS Network	198
AGROVOC	To participate and contribute to the AGROVOC thesaurus	343
AIMS Consultative Group	To participate in the latest proposals and ideas to improve AIMS in 2013	30
Announcements	News and announcements to the AIMS community at large	1,306
CIARD CMTF	To be part of the CMTF of the CIARD initiative	39
Metadata	To assure quality in the creation, management and exchange of metadata	768
Open Access	To share news, case studies and ideas on Open Access in the agricultural domain	797

Figure 3. Existing Groups of Interests in the AIMS Community of Practice

5. AIMS Portal use case scenario

***How is the AIMS portal of use to agricultural information management specialist*?**

The following use case provides some insight.

Thomas is an information management specialist in a developing country and is working in a quasi-government research institution for crops and livestock, and he is based in the headquarters. His initial users are researches employed by the institution and also have a national duty to expose the research outputs to the public. The institution is underfunded, and he has no technical support; however a lot of research outputs are deposited to his library both in print and electronic since a number of funded projects are running. His researchers constantly request from him key research reports from their fields of interests and also from the region. He clearly discerns the need of collecting, managing and disseminating agricultural research outputs. Thomas attends a workshop in information management and gathers from a colleague that the AIMS Portal might be of help to his situation. Upon return, Thomas logs on to AIMS and learns about how agricultural information management standards, tools and methodologies

- He learns that he can influence his institution towards openness to agricultural research outputs, and has accessed a lot of resources on AIMS about Open Access and also how to craft an advocacy programme

- He is able to download or use AGROVOC to index the records he has been collecting.

5

- He learns about M2B as a standard for metadata to describe his content.

- Besides, he can access AGRIS repository and in a click get access to 4.5 million records and over 25% of them providing links to the full record.

- He learns that he can even contribute to AGRIS repository if he either uses the AgriMetaMaker[4] or implement M2B standards in any of the available repository tools listed on Vest Registry tools.

- He joins AIMS, and since he has no technical support, he chooses to install an AgriOcean DSpace, and with the help of the AgriOcean DSpace Group of Interest – he configures his installation. He and his team are able to upload their full text papers and also use AgriOcean DSpace as a catalogue of their library. Now he can share his records with AGRIS and participates in other agricultural related networks such as VOA3R[5]

- He sets up a workflow whereby his researchers can deposit their papers to the repository. He also learns that he can provide also other value added services on his installation

- Now he learns through a blog post the start of an Open Data Group through a blog on AIMS, and he has some datasets in his institutions he intends to also publish them online.

- After 9 months, Thomas shares his experiences on AIMS as a case study and Abdul who is in a similar situation learns about this experience through a friend who is an AIMS registered user. Moved by Thomas experience, Abdul registers on AIMS too!

6.Conclusion

AIMS portal is a space for accessing and discussing agricultural information management standards, tools and methodologies and connects information specialists. The content available on the AIMS portal includes information on Open Access, Vocabularies, Metadata, Information Management Tools, Automatic Indexing, and Tools for managing vocabularies as well as linked data resources. In these topics, AIMS offer advice on standards and methodologies that can be used by various agricultural research institutions to manage and share their research outputs. Agricultural information management professionals are encouraged to belong to the AIMS Community to benefit from AIMS services and current examples happening within the agricultural domain. Finally AIMS resources benefit and have an impact on agricultural information specialists to improve their content management skills and their sharing of agricultural information.

---

[4] **AgriMetaMaker.**
http://aims.fao.org/agrimetamaker Date accessed 09/05/2013
[5] **VOA3R website**. http://voa3r.eu/ Date accessed 09/04/2013

References

1. Donatella, Fazio, Salema Gulbahar, Angela,Hariche (2012) The power of sharing information The e-Frame European Network on Measuring Progress and the Wikiprogress platform. http://www.cros-portal.eu/sites/default/files//NTTS2013fullPaper_118.pdf date accessed 18/04/2013

2. Anibaldi, S, Yves Jaques, Fabrizio Celli, Armando Stellato and Johannes Keizer.(2013). Migrating Bibliographic Datasets to the Semantic Web: the AGRIS case. *Semantic Web Interoperability, Usability, Applicability* (In print)

3. Caterina Caracciolo, Armando Stellato, Ahsan Morshed, Gudrun Johannsen, Sachit Rajbahndari, Yves Jaques, and Johannes Keizer.(2011)*The AGROVOC Linked Data Set*. http://eprints.rclis.org/17010/1/AGROVOC%20Dataset_vFinal_Preprint.pdf date accessed 08/04/2013

4. Zhang Wenqing, Li Yuan, Liao Yong (2012).Research on Agriculture Information Retrieve based on Neural networks and ontology. *Computer Science and Service System 2012* ,242-245.