

## VOA3R: VIRTUAL OPEN ACCESS AGRICULTURE & AQUACULTURE REPOSITORY: SHARING SCIENTIFIC AND SCHOLARLY RESEARCH RELATED TO AGRICULTURE, AQUACULTURE AND ENVIRONMENT

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**Abstract:** VOA3R is a 3-year European project launched in June 2010 and funded by the European Commission under the seventh framework ICT Policy Support Program. The general objective of the VOA3R project is to improve the spread of European agriculture and aquaculture research results by using an innovative approach to sharing open access research products. That will be achieved by carrying out innovative experiments with open access to scientific agriculture and aquaculture contents and by developing and providing services that integrates existing open access repositories and scholarly publication management systems by means of a federation approach. The technology used will itself become open source, so that the model of the service can be adopted by enterprises (including SMEs) or other kinds of institutions as a value-added, community-oriented model for open access content.<sup>1</sup>

**Keywords:** Open access, scholarly research, agriculture, aquaculture, information.

### VOA3R: An Introduction

VOA3R is a 3-year European project launched in June 2010 and funded by the European Commission under the seventh framework ICT Policy Support Program. The ICT Policy Support Programme aims at stimulating innovation and competitiveness through wider uptake and best use of ICT by citizens, governments and businesses.

VOA3R started with 14 organizations from 10 European countries and 2 external organizations:

- University of Alcalá, Spain
- Agricultural University of Athens, Greece
- Greek Research and Technology Network, Greece
- Technological Educational Institute of Athens, Greece
- University of Duisburg-Essen, Germany
- Swedish University of Agriculture Sciences, Sweden
- Hasselt University, Belgium
- International Center for Research in Organic Food Systems, Denmark
- French National Institute for Agricultural Research (INRA), France
- Association de Coordination Technique Agricole, France
- ACTAInfo, France
- Czech University of Life Sciences, Czech Republic
- Agricultural Research Institute, Cyprus
- Consorzio Interuniversitario CINECA, Italy
- Food and Agriculture Organization of the United Nations (FAO)
- UNESCO-IOC/IODE

New partners will join during the project. VOA3R is also connected with the European projects OpenAire (<http://www.openaire.eu/>) and Driver (<http://www.driver-repository.eu/>) and with Eurocris (<http://www.eurocris.org>).

Under a strict open access policy, the VOA3R service will connect libraries, archives and other publication systems by providing advanced search interfaces that include the specific aspects of research work (methods, variables, measures, instruments, techniques, etc.) that are specific of the particular domain. The users of the VOA3R service are academics and researchers but also students and practitioners who either want to search for or to publish

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<sup>1</sup> <http://voa3r.eu/>

scientific research results (for these roles, learning material related to the application of scientific outcomes is also considered, as a sub-product of research). The project is targeted to the domain of Agriculture & Aquaculture, as it re-uses previous domain models for these domains, but the technology and models integrated are to a large extent transferable to other academic disciplines.

The VOA3R platform aims at reusing existing and mature metadata and semantics technology to deploy an advanced community-focused integrated service for the retrieval of relevant open content and data. It includes explicit models of the scholarly methods and procedures used and of the practical tasks targeted by applied research (a principal information need for practitioners). The service will enable researchers to formulate their information needs in terms of elements of the scientific methods established in their fields (variables, techniques, assessment methods, kinds of objects of interest, etc.) combined with topical descriptions as expressed in metadata. The community approach will enable the enhancement of information seeking with extended evaluation elements (such as ratings, public reviews, social tagging and links to supporting or conflicting reports) that complement and also go beyond the traditional, anonymous peer review process, in which results are not made available openly.

The major objectives of VOA3R are:

- Devising and providing a single access point to scholarly research in the area of agriculture, aquaculture and related sciences. The VOA3R platform integrates the existing open access repositories as well as digital libraries, sharing scientific and open access research related to agriculture, food, aquaculture and the environment. VOA3R is also dedicated to providing a community-oriented platform based on social networking, micro-blogging and social bookmarking.
- Analyzing and modeling research work processes, inputs and outcomes, and coming out with a detailed meta-model that will be the basis for new search and navigation interfaces that are specific to scholarly information needs.
- Analyzing existing and alternative approaches to the evaluation of scholarly research.
- Experimenting with alternatives to peer review in the context of open access repositories, based on the meta-models.
- Formalizing meta-models of research work, coming up with ontologies that enable new forms of search and browsing enhanced by existing semantic metadata repository tools.

#### **Background: Open Access**

A primary task of VOA3R is to create a portal for publications and related research output in Open Access on the topics of agriculture, aquaculture, environment and related sciences. Journals (see <http://www.doaj.org/>), conference proceedings and repositories are the most common forms of Open Access.

The repositories collect a variety of resources: published work (usually the author’s final version), reports, presentations, maps, audiovisual materials, unpublished material, and research data. VOA3R will harvest repositories with the following targets:

<b>Table 1: VOA3R Targets<sup>2</sup></b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Number of files available through Open Access	200.000	500.000	2.500.000
Number of Open Access Repositories integrated	4	8	10

*Table 1. VOA3R Targets.*

The content providers involved in the first phase and their corresponding systems are:

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<sup>2</sup> VOA3R, Report on Content Integration/Population (Phase 1), 2011, p. 15. Unpublished.

<b>Table 2: Partners and their repositories<sup>3</sup></b>	
<b>CINECA</b>	U-GOV system (www.u-gov.eu)
<b>FAO</b>	OA/Doc (www.fao.org/documents)
<b>ICROFS</b>	Organic Eprints (www.orgprints.org)
<b>INRA</b>	ProdINRA (www.prodinra.inra.fr/prodinra/pinra/index.xsp)
<b>SLU</b>	Epsilon repository (http://www.slu.se/en/library/publish/search-epsilon)
<b>UHasselt</b>	OceanDocs (www.oceandocs.net), IBSS Repository (http://repository.ibss.org.ua/dspace/) and CEEMAR (http://ceemar.org/dspace/)

*Table 2. VOA3R Partners and Their Repositories*

Other providers will be invited to join during the project.

Quality control is an essential part of the scientific publication cycle. Scientific journals have developed peer review to control the quality of the submitted articles. Universities and research institutes assess the scientific work of researchers by evaluating their publications, with the Web of Science as the main benchmark.

Publishing in repositories requires a new way of quality control. Articles in repositories generally did not go through peer review. At the same time, the Internet makes new forms of review and assessment possible. VOA3R is exploring these new forms and how they can be integrated **Communities of practice: The Internet - Social Networks - Web 2.0**

Interesting examples are:

- LinkedIn, as a professional network<sup>4</sup>
- CiteULike<sup>5</sup> and Zotero,<sup>6</sup> bringing reference managers into a social bookmarking environment
- Mendeley,<sup>7</sup> a collaboration platform with bibliographic and other tools to support research
- MyExperiment,<sup>8</sup> a site to share research objects

VOA3R's ambition is to integrate the harvested content in a scientific social network, to bring the archive alive. Research is about working together, about sharing a joined passion and interest. The VOA3R platform focuses on identity, relationship, activity and collaboration. No matter how much software we build, people build the relationships, and they build them out of words first!  
in its Open Access research platform.<sup>9</sup>

### **Stakeholders**

A number of stakeholders has been defined: researchers, academics, practitioners, students, information managers, decision makers, the industry and other organizations; but also the anonymous web surfer and certainly other systems and services are involved. These stakeholders can act as producer and/or consumer. A scientific platform can offer to the producer different opportunities, from publishing research online, which should make research items more accessible, to an electronic CV. It can help to enrich the scholarly process by supporting the pre- and post-publishing phases, by creating a dialogue between stakeholders and by linking it in the research environment.

Consumers' needs are on the level of information retrieval and processing. They need tools to search the heterogeneous and Open Access content: browse options, timelines, simple and advanced search with semantic support, authors' backgrounds and other relevant resources and tools to work with the search results. These include bookmarks, comments, annotations, ratings, reading baskets, etc. to enhance interactivity.

<sup>3</sup> VOA3R, Report on Content Integration/Population (Phase 1), 2011, p.16. Unpublished.

<sup>4</sup> <http://www.linkedin.com>

<sup>5</sup> <http://www.citeulike.org>

<sup>6</sup> <http://www.zotero.org>

<sup>7</sup> <http://www.mendeley.com>

<sup>8</sup> <http://www.myexperiment.org>

<sup>9</sup> VOA3R, Process models for scholarly publication Analysis of peer review mechanism, 2011. <http://voa3r.eu/>

## The VOA3R Platform and Its Services<sup>10</sup>

The key objectives are to improve the spread of agricultural, aquacultural and environmental research results by using an innovative approach to sharing Open Access research products by integrating existing Open Access repositories and scholarly publication management systems. The main innovation is based on a community-focused integrated service and a social portal.

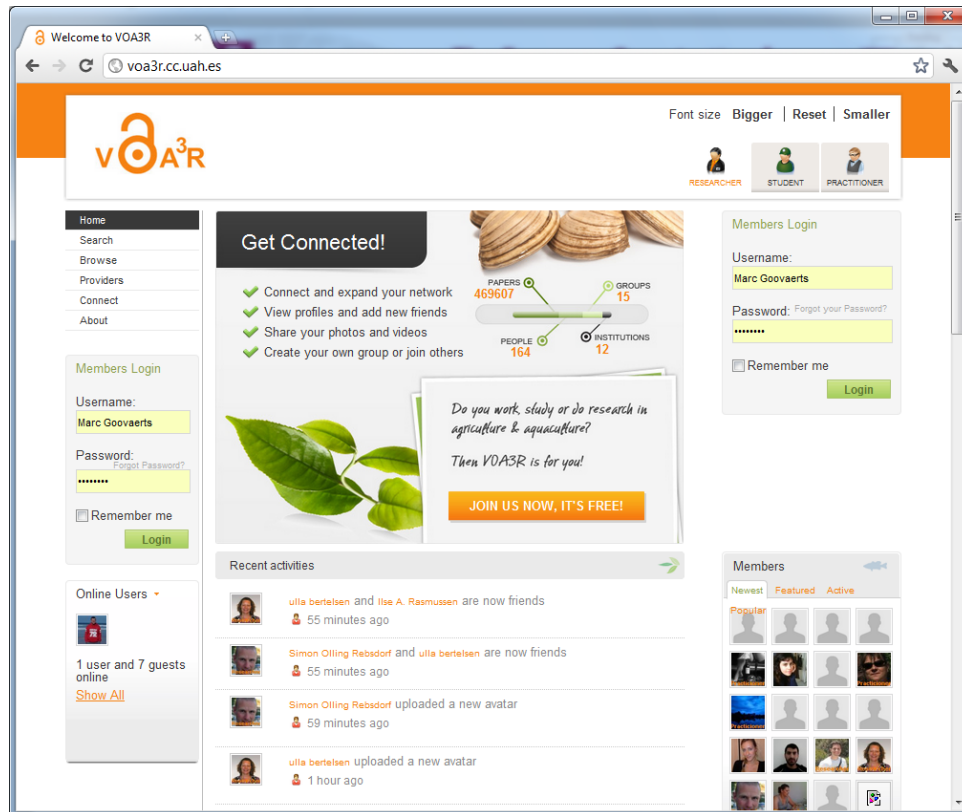


Figure 1. The beta version is available at: <http://voa3r.cc.uah.es/>.

## Repository

After the first half of the project the VOA3R platform contains nearly 500.000 Open Access documents. VOA3R is on schedule.

<sup>10</sup> <http://voa3r.cc.uah.es/>

<b>Table 3: Resources harvested in Phase 1 by VOA3R partners<sup>11</sup></b>		
CINECA	U-GOV system ( <a href="http://www.u-gov.eu">www.u-gov.eu</a> )	28
FAO	OA/Doc ( <a href="http://www.fao.org/documents">www.fao.org/documents</a> )	402.324
ICROFS	Organic Eprints ( <a href="http://www.orgprints.org">www.orgprints.org</a> )	11.884
INRA	ProdINRA ( <a href="http://www.prodinra.inra.fr/prodinra/pinra/index.xsp">www.prodinra.inra.fr/prodinra/pinra/index.xsp</a> )	7.180
SLU	Epsilon repository ( <a href="http://www.slu.se/en/library/publish/search-epsilon">http://www.slu.se/en/library/publish/search-epsilon</a> )	5.553
UHasselt	OceanDocs ( <a href="http://www.oceandocs.net">www.oceandocs.net</a> ), IBSS Repository ( <a href="http://repository.ibss.org.ua/dspace/">http://repository.ibss.org.ua/dspace/</a> ) and CEEMAR ( <a href="http://ceemar.org/dspace/">http://ceemar.org/dspace/</a> )	6.407

*Table 3. Resources harvested in Phase I by VOA3R partners.*

Already the repositories of five new affiliated partners are being harvested:

<b>Table 4: New affiliated partners: Resources harvested in Phase 1<sup>12</sup></b>		
Cemagref, France	Cem@Doc Portal	10.985
National Documentation Center / NHRF, Greece	National Documentation Center (EKT)	1.100
Agricultural Faculty of Cukurova University, Turkey	TrAgLor	794
Wageningen University, Netherlands	Wageningen University & Research Center Publications (WAY)	17.273
Ifremer, France	Archimer	8.210

*Table 4. New Affiliated Partners: Resources Harvested in Phase I.*

<sup>11</sup> VOA3R, Report on Content Integration/Population (Phase 1), 2011, p. 14. Unpublished.

<sup>12</sup> VOA3R, Report on Content Integration/Population (Phase 1), 2011, p. 17. Unpublished.

VOA3R opt for high quality metadata. It has developed its own VOA3R application profile creating a richer metadata set based on Dublin Core, but other rich metadata standards like AGRIS AP and MODS are supported as well. Ontologies are used, in the first place AGROVOC. VOA3R is committed to exposing its contents as open linked data expressed in RDF.

### The User Interface (\*)

The VOA3R platform is in beta version. The actual functions will be enhanced based on pilot trials and user studies. Therefore the interface is not yet in its final form.

### Search Options

The user can define his role, as a researcher, a student or a practitioner. Depending on the role, adapted tools are provided.

Different search options are available: tag based – text based – navigational - social – author. The tag-based option shows a tag cloud with a specific option for Agrovoc terms.

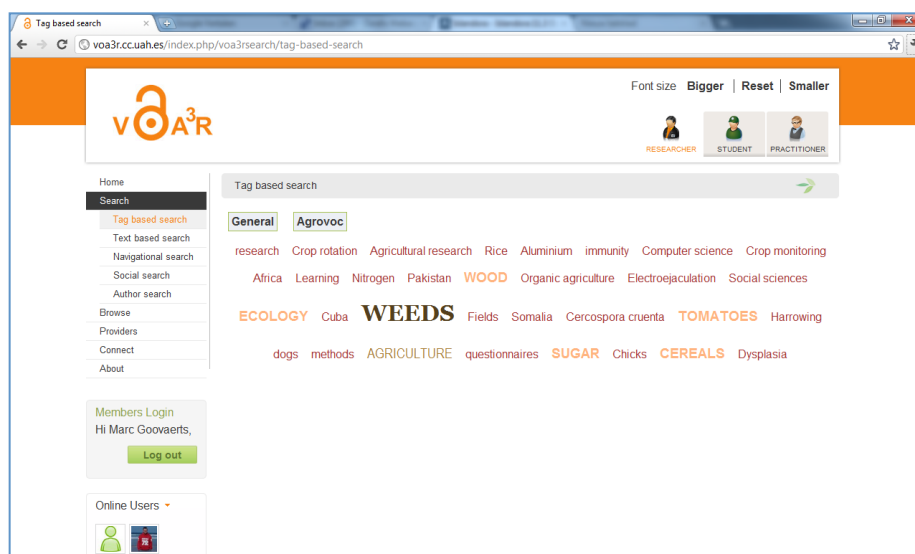


Fig 2. Tag-Based Search For Agrovoc Terms.

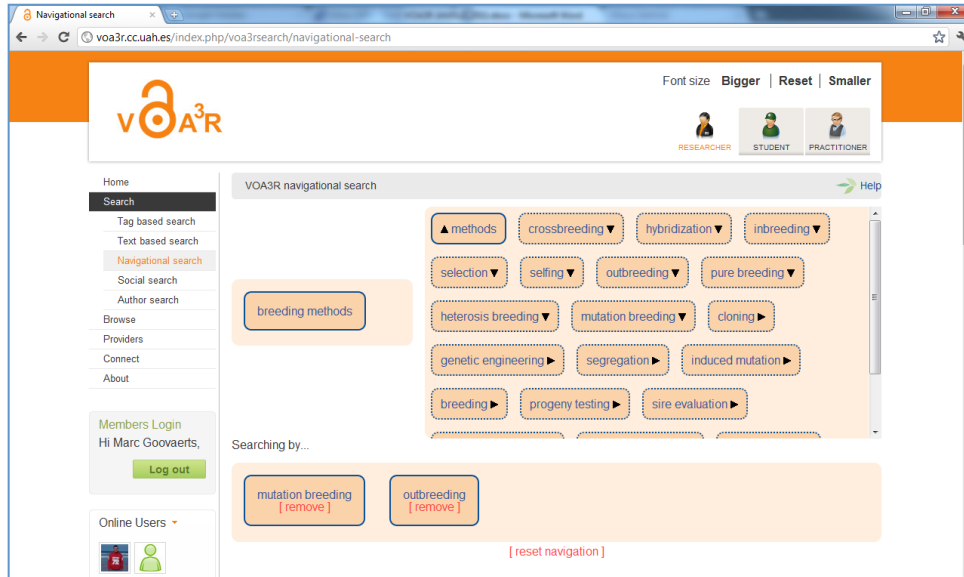


Figure 3. Navigational search.

Documents can be browsed on a timeline or a map view.

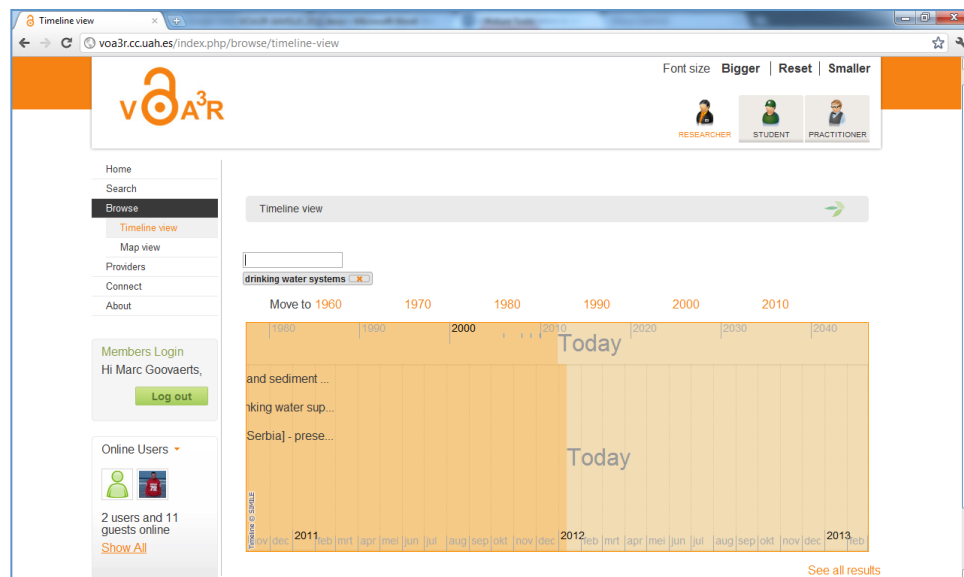


Figure 4. Timeline View.

The result of a search is the start of new activity. When logged in, the user has the option to promote, discuss or annotate the resource. He can give it a rating. Some related articles are presented at the bottom of the screen. He also can search in other Open Access databases for related articles. If he is the author of the article, he can claim the article.

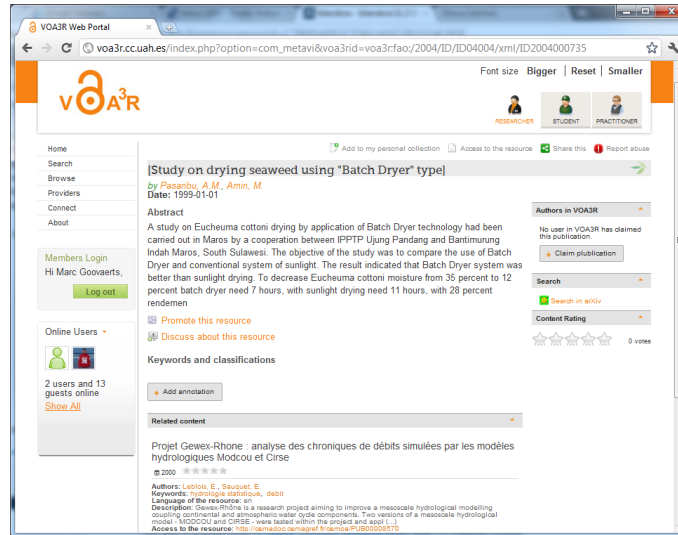


Figure 5. The Record and the User's Options.

## Community Features

The development of a social component to the VOA3R platform creates many opportunities but it will be confronted with specific challenges. Mainly generalist social networks like Facebook and LinkedIn seems successful at the moment.

To be successful, VOA3R will need to create a critical mass of active users. A large part of the research community does not want to share their information in an open environment. The older generation has its network and communication tools.

Finally, a multitude of networking services are becoming available. Users have choices. They may have already profiles in Facebook, LinkedIn, Mendeley, CiteULike and others. The maintenance of all these profiles can be a problem.

The VOA3R platform is addressing these challenges and will deliver extra value to the users by offering the ability to integrate data from existing social networks and by presenting specific tools to support scientific communication besides classical tools like development of a profile, ratings, public reviews, suggestions, etc.





Figure 6. The Interface Of the Social Component Of the VOA3R Portal.

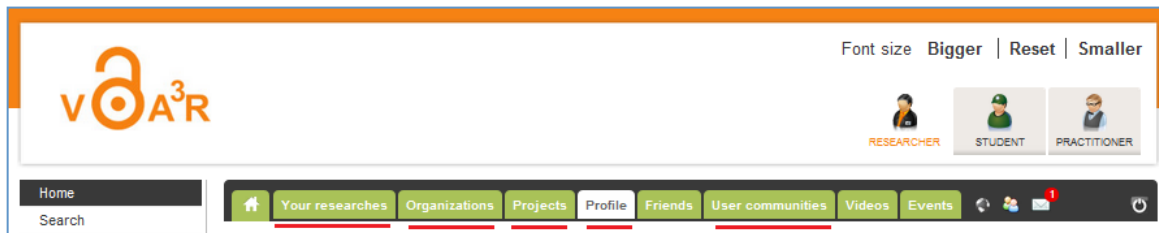


Figure7. The Different Research Or Practitioner Oriented Tools In the Platform Grouped By Tab.

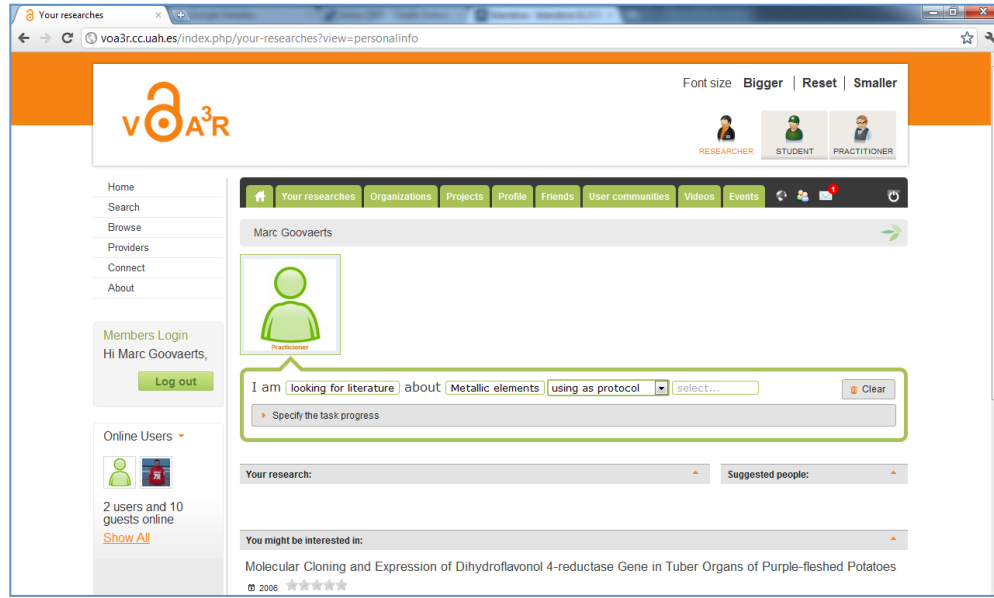


Figure 8. The workflow in the research can be defined and shared.

The beta version already includes the possibility of importing profile data from Mendeley. A researcher profile gives different possibilities for managing different aspects of the research, from one's own research to projects and communities. On that level the VOA3R platform becomes a fully-fledged research platform.

The content and community features are combined as described in the next scheme.

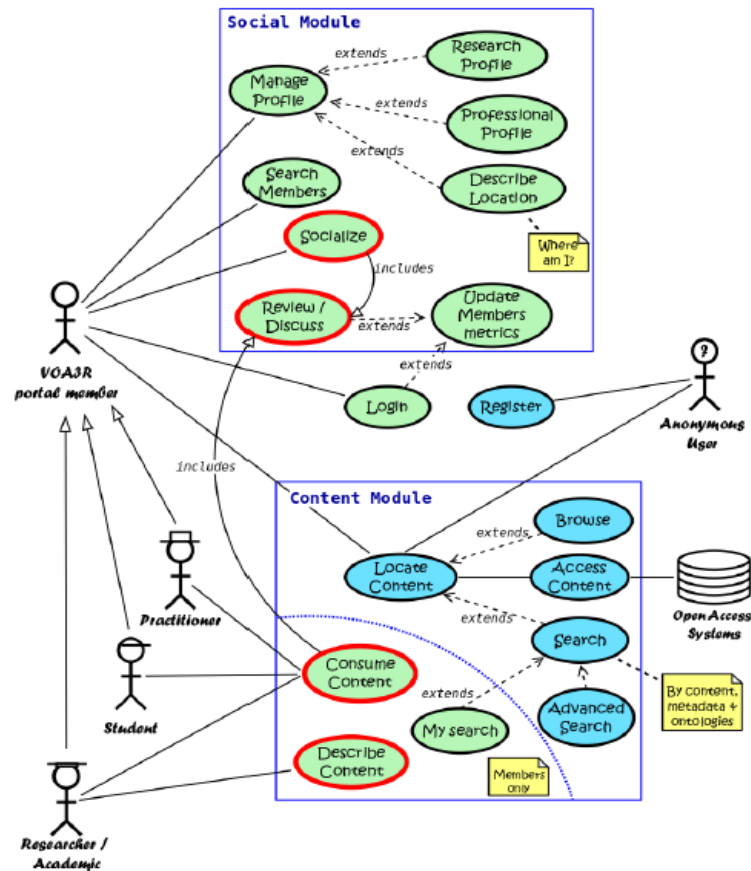


Figure 9. Content and community features.

## Conclusions

The VOA3R project is now halfway developed as a European project. The main goal, the development of a web portal for the agricultural, aquacultural and environmental communities containing open content, has been realized on a technical level. The platform now exists as an embryonic community tool.

In the next eighteen months, new partners will be invited to submit content to the portal. They will find a project that:

- Creates new approaches to open access resources.
- Integrates these resources in a dynamic social network.
- Uses high-quality metadata standards, defining models to describe research methods and processes in a social environment.
- Experiments with alternative forms of quality control and assessment of publications.