

Agricultural Learning Repositories (AgLR 2008) E-Conference

24 April – 15 June 2008

<http://aglr.aua.gr/econf.php>

Summary Report, June 2008

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Summary

This report provides the summary of the discussions that took place during the Agricultural Learning Repositories (AgLR 2008, <http://aglr.aua.gr/econf.php>) E-Conference. AgLR 2008 aimed to explore the needs and requirements of stakeholders involved in the development and operation of agricultural learning repositories. It was organised as an electronically facilitated discussion, during April 24 – June 15, 2008. AgLR 2008 was supported and promoted by the Agricultural Learning Repositories Task Force (AgLR-TF, <http://aglr.aua.gr>).

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1. Introduction

Making learning resources available online on a global scale could be an enabler for the development and welfare of agricultural and rural populations. One mean to achieve this aim, is the development and promotion of a global infrastructure that will facilitate sharing and reusing of learning resources on topics related to agricultural and rural development. To this end, the experience of stakeholders that are involved in the development and operation of agricultural learning repositories would be of extreme value. These stakeholders can promote and share guidance, standards, technologies, tools, recommendations, and good practices in a variety of topics:

- Designing, Developing, Adapting, and Repurposing Learning Resources
- Setting up Learning Repositories using Open Standards and Technologies
- Populating Learning Repositories with Reusable Learning Resources and Interoperable Metadata
- Designing and Implementing a variety of Quality Assurance Procedures and Criteria for Learning Resources
- Inter-connecting Learning Repositories in Global Federations to share and exchange Resources and Metadata
- Deploying Regional Portals that provide Access to Learning Resources in Repositories around the world through Federated Services

To this end, the *Agricultural Learning Repositories Task Force* (AgLR-TF, <http://aglr.aua.gr>) organised the *Agricultural Learning Repositories (AgLR 2008, <http://aglr.aua.gr/econf.php>) E-Conference* during April 24 – June 15, 2008. AgLR 2008 aimed to initiate the dialogue around these topics, involving organizations and individuals that are active in the field of agricultural learning repositories.

The AgLR 2008 e-Conference was organised as an electronically facilitated discussion that took place through a *DGroups* mailing list (<http://www.dgroups.org/groups/fao/aglr-tf/>). It was organised around 7 main themes that corresponded to the following phases:

- **Phase 1 (24-27 April 2008):** Introductions, stage setting
- **Phase 2 (28 April - 4 May 2008):** Understanding and expectations from learning resources for agricultural and rural communities
- **Phase 3 (5-11 May 2008):** Repositories with open educational resources for agriculture and rural development
- **Phase 4 (12-18 May 2008):** Metadata and ontologies for agricultural learning resources
- **Phase 5 (19-25 May 2008):** Tools and technologies for agricultural learning repositories
- **Phase 6 (25 May - 1 June 2008):** Promotion and use of agricultural learning repositories
- **Phase 7 (2-15 June 2008):** Closing, next steps

At the beginning of each Phase, an invited expert (the Phase Moderator) posed a set of questions related to the topic of the Phase. Participants then responded through e-mails to the list, providing their replies to the posed questions. At the end of the Phase, the Moderator collected and reported a summary of the feedback received from all participants. This report integrates the summaries that have been collected and reported by all Moderators.

In addition, recognized experts have been invited to give short keynote interviews on each Phase topics. These speeches have been recorded and are available online: <http://aglr.aua.gr/node/25>.

2. Phase 1: Introductions and Stage Setting

During the first phase of the e-Conference, a brief introduction together with some guidelines have been circulated to the registered members of AgLR-TF. When AgLR 2008 was launched, about 105 participants were registered in the AgLR-TF mailing list. As the e-Conference progressed, more people were attracted to register. At the end of the e-Conference, there were 127 registered participants.

From an analysis of their countries of origin, it can be observed that a total of 29 countries were represented in the e-Conference. Figure 1 shows participant representation by Country. The graph includes only those countries where we have at least 2 or more participants.

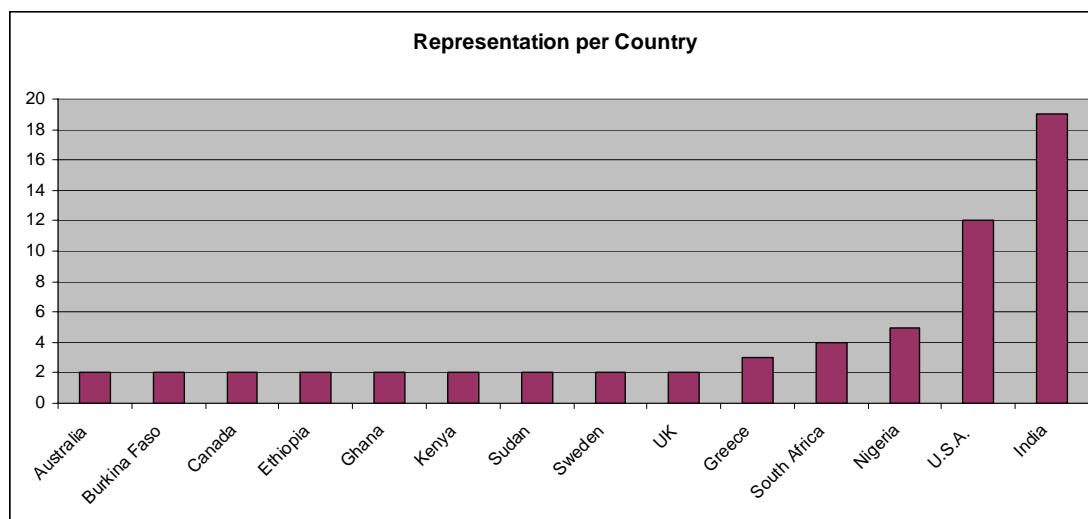


Figure 1. Participants per country (only countries with more than 2 participants are shown).

Apart from the ones presented in Figure 1, the following countries were also represented: Armenia, Cote D'Ivoire, Czech Republic, Iran, Ireland, Lithuania, Malawi, Netherlands, Poland, Portugal, Spain, Sri Lanka, Thailand, Turkey and Zambia.

A large number of participants (about 30) were representing some international organization (such as Commonwealth of Learning, Food and Agriculture Organization of the United Nations). To date, participants from 16 international organizations are registered in the TF. (Figure 2).

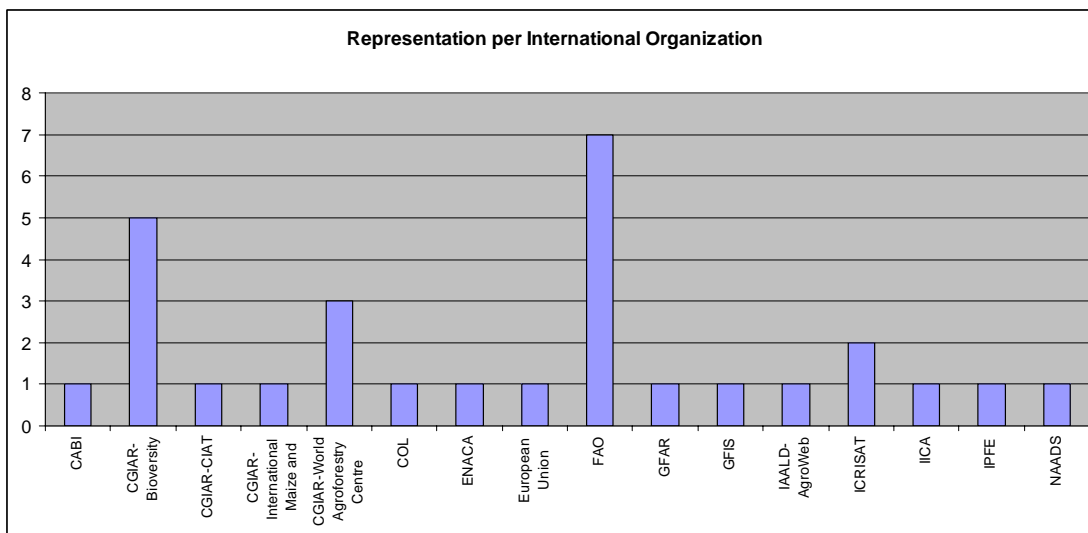


Figure 2. Participants per international organization.

The coverage by regions is shown in Figure 3. From the list of those who registered, about 44% were from Europe and 38% from Africa. Less than 3% were from Asia, North America and Australia. Nevertheless, these regions were also represented by participants that work for an international organization (about 14% of the participants).

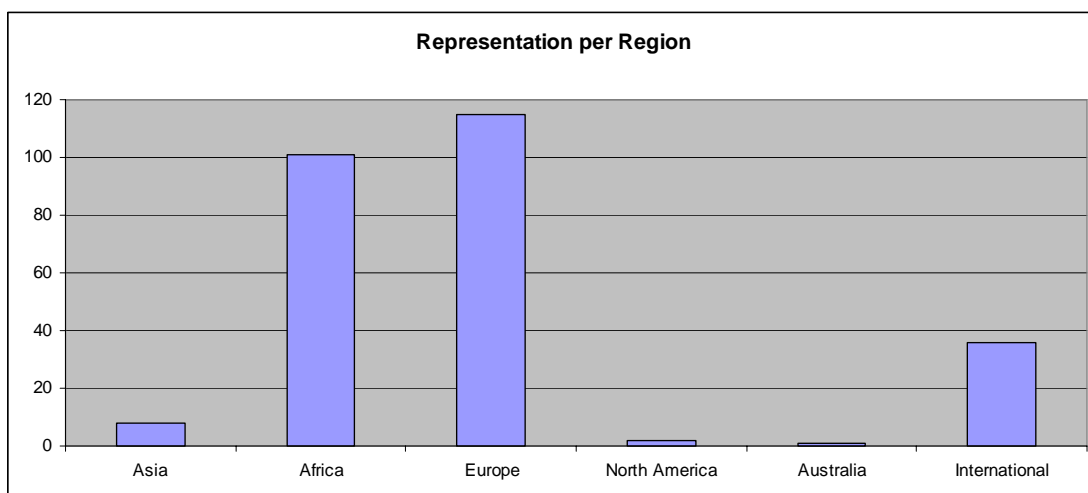


Figure 3. Participants per geographical region.

3. Phase 2: Understanding and expectations from learning resources

Moderator and Rapporteur: Nikos Manouselis (Informatics Lab of Agricultural University of Athens, Greece)

The 2nd Phase aimed at exploring the participants' understanding and expectations from learning resources for agricultural and rural communities. More specifically, it sought for participants' feedback about the potential communities that could use learning resources on agricultural and rural topics, and the learning resources that would be relevant for them.

3.1 Targeted communities

Question posed: Which communities of users would you characterise as potential learners on topics related to agriculture and rural development? Please especially describe learners related to your geographical region and area of expertise. Provide information related to their geographical location, their language, their age, their educational background/level, their profession, etc.

The responses of about 14 participants indicated that the main user communities that can be characterized as potential learners in a rural and agricultural context are the following:

- Those pursuing agriculture and allied subjects as a field of study leading to the award of a first or post-graduate degree. Can include: agricultural scientists at the universities and national level institutions; training faculty in the extension and training institutions; academia in the research, extension, agri-business, and marketing organisations; students and research scholars in the universities and organisations. This group has been reported as mainly including today's or tomorrow's agricultural researchers, who are adults mainly from urban areas, who have at least some formal university education and usually some advanced postgraduate degree as well. They are computer literate and often are extensively networked with other researchers - nationally or even internationally.
- Those practicing agriculture (i.e. the farmers), and other people professionally engaged in various aspects of the sector such as agri-input companies and commodity traders. Mostly following vocational training schemes, that may not require attendance of a formal course and may not necessarily lead to the acquisition of a certificate or degree. This group has been reported as mainly including adults in rural areas (with a particular focus in Africa, Asia or Latin America) that have not acquired some formal education (usually only some basic education), who are usually not computer literate and who very often have limited financial resources. They have been characterised by respondents as very busy people, with low availability to receive training classes, that belong to very different age and educational classes.
- Others involved/interacting with rural and agricultural communities. That is: people working in government departments; NGO's; library and information service providers; producers of mass media (print and electronic) programmes; financial service providers (e.g. bank and insurance agents); policy makers and lobbyists (e.g. politicians); and even general public. This group has been reported as mainly including adults from peri-urban areas that have acquired some formal education degree (at least a high school diploma) and in some cases possibly also some technical training related to extension. They can be considered as computer literate, and are networked with farmers and fellow members in their local / regional extension system.

Depending on the organization(s), these groups have diverse profiles and needs. E.g., for the case of CGIAR, learners are mid-career professionals of different educational background and expertise (e.g. researchers, technicians, development specialists, extension workers, policy makers) that attend short in-service training courses based on advances in agricultural and natural resources management research for development as obtained by these CGIAR Centres.

Also learner characteristics differ greatly depending on the country or geographical region. For instance, one participant reported that agricultural education and training in the UK has both an academic and work-based component. Some learners in the agricultural industry will take specialist career based training courses while still working - e.g. stock handling, arboriculture, agricultural engineering. Others on full time academic courses may cover the full range of biological sciences as applied to agriculture and animal husbandry, or specialise in certain areas (e.g. soil science, environmental sciences). Training may take place at university, agricultural college (usually affiliated to a university), or college of further education. The colleges may offer both degree (BSc), degree-equivalent (HND) and practical training courses at diploma or certificate level. The educational levels of learners at intake may be different and their information needs during training may reflect more or less practical resources.

In India, the people that are closely working with farmers are a learner group of particular importance. It generally includes: agricultural extension workers at village level; extension managers at district and state levels; agricultural department functionaries on projects; change agents of NGOs; agents or dealers of private companies (input supply companies); scientists of research centres (in case of India, it is Subject Matter Specialists of Krishi Vigyan Kendras - the KVKs, and scientists of Zonal Research Centres in each state); functionaries of agricultural produce markets; bankers who deal with agricultural financing in the rural areas; functionaries in the public information centres / kiosks and information centres established by private companies who offer advisory services to farmers. An interesting fact is that there are about 5,000 Agri-Clinics and Agri-Business Centres (ACABCs) in India which are owned by unemployed agricultural graduates. ACABCs provide various types of services to farmers directly in the rural areas. This group of young agri-entrepreneurs with agricultural background is a characteristic one of potential learners. All the above learners are at least graduates in agriculture and allied disciplines and able to understand English.

Apart from the formal learner groups identified above, respondents indicated that nearly all audiences can be considered as potential learners with respect to agriculture and rural development. This is due to the fact that increasingly we are moving to create access - not just connectivity - to learners of many types: the food and fuels discussions and the urban-rural issues means that everybody has a stake in these issues one way or another. In a knowledge-based society (as the European and US ones), the discussion focuses on participation, experiential learning, just in time, broadening what we offer and to whom in a way that we can say that our interventions are truly expanding access to sources of knowledge.

3.2 What is a learning resource

Question posed: Describe a little bit your understanding of a learning resource for agricultural and rural learners:

- Which topics would you expect as being interesting for these learners? (e.g. general agricultural ones, specific agricultural topics/practices/methods, ICT and computers, other more generic topics).

- Which learning resource types could you think of as being useful for them? (e.g. lectures, case studies, games, glossaries, how-to guides, papers, reports, web sites, etc.).
- What media formats would be more appropriate? (e.g. Powerpoint files, Word files, Excel files, PDF files, audio files/podcasts, video files, images, HTML pages, etc.).
- Which is the granularity level of the learning resources that you believe that these learners would find more relevant to their needs? (e.g. single raw media files or documents, lectures, complete courses, and/or whole educational programs).

The responses of about 15 participants provided feedback upon the following issues that this question rose.

Topics

Relevant topics have been classified depending on the learner communities:

- *For university students/researchers*: an extensive range of topics with a theoretical bias. For instance, Turkish learners visiting the TrAgLor repository (<http://traglor.cu.edu.tr/>), show preference on topics related to olive culture, organic production techniques and marketing, olive oil processing, beekeeping, biofuels, sheep production practices, stone pine biology, and some new alternative produces like kivi, shrub. Other new topics of interest may include carbon credits, futures trading, bio fuels, genetic engineering, nanotechnology etc. and their respective relevance to agriculture.
- *For farmers and other agricultural professionals*: mostly on good agricultural practices (like farm budgeting, integrated nutrient management, integrated pest management, disease management, soil testing, water testing, seed treatment, alternative production methods), natural resources management, irrigation management principles (like soil water movement, irrigation equipment and irrigation strategies), post-harvest technologies, food processing, value addition, quality standards, export opportunities, certification of produce, packaging, storage, information about markets, as well as appropriate technology and cottage industries. Apart from the typical agricultural/farming topics of interest, respondents indicated that as employment in agriculture is decreasing, other livelihoods in rural areas will become increasingly important: horses, flower retail, environmental impact and services, business management, information literacy, etc.
- *For others*: topics depend on the specific categories;
 - Those who are distantly working for farmers may need more knowledge that sharpens their professional activities (topics like project management, evaluation of projects, training management, farm business management, management of institutional repositories etc.).
 - Project managers, mission directors and public functionaries in different state government departments may be interested in topics related to research management, research prioritisation, preparation of projects, monitoring of projects, intellectual property rights, agri-entrepreneurship development.
 - Bank and insurance agents may need an overview of animal husbandry, poultry, sericulture projects for sanctioning loans and policies. Journalists and general public may need information about controversial/hot topics like: genetically modified organisms (GMOs); and organic farming with a bias towards causes and effects.
 - Government departments and revenue officials might be interested on topics that will improve decision-making in agricultural governance and implementation of programs (such as market-led extension, public-private partnerships in agriculture, farming systems approach, mainstreaming gender, commodity interest groups, food safety and standard, contract farming, impact of trade agreements on specific crops, commodity exchanges, watershed management and soil management).

For the wide and diverse audience of CGIAR, topics of interest generally cover country agriculture, natural resources management, and integrated agricultural development that considers the very complex nature of farming in developing countries. CGIAR Centers also focus on more specific ones: 'commodities' such as rice, maize, wheat, millet, sorghum, tree crops, livestock, fisheries; as well as policy, genetic resources, water management, etc.

Resource types

All types of learning resources have been identified as relevant by the participants. The most 'classic' resource type is the one of lecture/slide presentations (in PPT, PDF or other format), often supported by a short lecture note. Pending the need and availability of financial resources, more formal learning resources (such as manuals, text books, video, slides, etc) may be also developed.

For the academic learner groups, learning resource types are likely to require more evidence-based content reflecting the traditional approach to scientific study. On the contrary, professional learner groups are likely to be responsive to more specific "need to know" resources, with a higher level of practicality (such as use cases, how-to guides, charts and diagrams, posters, answers to questions, Websites with topical content). In both cases most materials would ideally be driven by the specific needs of the curriculum.

Some particular points have though been raised:

- Even for a scholarly audience employing novel formats like games would generate more interest and ensure better participation. Games seem to be the staple format for youngsters.
- The most practical and useful resource type would be 'how-to-guides' and case studies in the form of success-stories (and also failure-stories) told by practitioners. Rural practitioners would be more liable to benefit from practical experiences from their peers in other rural communities than from city-based, academic experts that tell them how things should be done, and who often lack specific knowledge about local conditions.
- Teachers like to have videos but there is a reservation about how much the younger (YouTube) generation will be impressed by this resource type.
- Teachers also express interest in using tests from others, but a server with tests will probably be not very successful if it is hard to find relevant tests (finding should take less time than making your own).
- Synchronous events may also be captured in media-rich formats that allow asynchronous access (most often through the WWW). Hence, e.g. lectures are recorded - in tools such as Flashmeeting (<http://flashmeeting.open.ac.uk>) - and made available to a wider audience that can comment on them and request clarification of issues that need further clarification.

Media formats

Different opinions have been expressed as far as appropriate media formats are concerned. Popular formats like PDF, video files, Podcasts have been reported as very useful for all types of learners. Websites are useful for sharing dynamic information. Videoconferencing through webcams is also helpful in the interactive learning process. Generally speaking, the majority of respondents expressed its preference to multimedia and interactive formats. Such formats may be problematic to providers where bandwidth or computer memory is a problem. Characteristic points that participants made include:

- Video files and Flash animations would be preferred, especially by students.

- Well-designed Word files would be easier to create, store and download.
- PowerPoint (PPTs) presentations with some supporting text in the form of notes, and a series of references/further readings enriched by some instructional design and pedagogic elements, can be suitable.
- Media formats are highly context-dependent. For instance, traditional audio (radio cassettes) are still the most effective e-learning delivery medium in many rural communities in Africa and Asia. Since about half of the world's population has mobile phones, an especially important format for wide access would be audio-augmented PPTs that can be played in the mobile phone.
- As far as possible, a single topic may be in the form of reading document that can be downloadable. And this material, if necessary, should be supported by lectures, presentations, videos, podcasts, animations, references to other sources on the web etc.
- It would be important to produce materials in a single source independent from the final format of delivery. This would permit to generate the necessary files when needed, e.g., PDFs, HTML, or any combination of files, including multimedia.
- HTML files with a high percentage of images should be the primary source. This could be supplemented with downloadable video / audio files. Other conventional MS Office tools may be used depending upon relevance to the topic.

Granularity

Granularity has been highlighted as an important but difficult issue, with different opinions expressed about this. Some indicated that rural and agricultural audiences require mostly 'cut and dried' materials that are ready for use (such as complete courses and programs). Quite often though, training departments also opt for a training-of-trainers approach, therefore the idea of having lower-order granularity resources has gained prominence in recent years due to their potential reusability.

Overall, granularity would depend on the context. The lesson or unit level might fit best (e.g. a particular learning task with corresponding support materials and exercises). The reason is that at such a level, they may be able to provide ready-made answers to focused, practical questions. But they should be combinable into larger themes as well, if possible. Relations could be defined among them, in order to be able to follow a specific sequence or learning path through resources that are related to a specific course or educational program. Ideally, resources could be also tagged in terms of "competency gaps", i.e. what kind of pre-knowledge that is required, and what kind of post-knowledge that the learning resource is aiming to induce in the learner.

In terms of learner groups, one could say that students need generally multimedia courses on a whole course or at least one unit of the course. Contrarily the didactical people wishes to use more deeply granulated objects in order to re-use them in their courses and/or presentation construction. For these reasons, the both the lowest and the highest granularity should be provided to the users. In terms of technical environments, a repository usually serves more granular objects, whereas whole courses may be better for LMS/LCMS environments.

A main problem around granularity is that in several occasions the people developing learning resources are doing this in parallel (or as a side-outcome) of other main professional activities (e.g. conducting agricultural research). Therefore, getting those people devoting time and effort to co-develop learning resources of a desired granularity is often challenging.

3.3. Ways to use learning resources

Question posed: In which ways would you expect these learners to use digital resources to facilitate their learning process? E.g. would you expect this use to take place in instructor-led forms, in self-paced forms, in collaborative learning forms, or some other way? You may explain why if you want.

A variety of forms are being considered, depending on the learning group and educational context. One of the important arguments expressed during this phase is that agriculture (and natural resources management, in general) are unlike many other topics very practical and contextualized subjects, that mostly cannot be taught entirely in an online environment. Thus, it is important to look for innovative blended learning approaches that allow learners to practice what they learn and to see this in their 'real world' environment. E.g. many agricultural topics require direct demonstrations and/or work in the field or laboratories. A blended approach could combine certain on-line components before and after a face-to-face session.

Self-instructional learning could also be an option (paper-based or CBT), but requires a lot of preparation. If applicable, digital resources can be made available on a laptop while in the field, for simulations or interactive exercises. In general, paper-based resources would be preferred in order to take notes. Another self-paced activity could be requesting "lectures on request" (that is, "knowledge-push" informed by "knowledge-pull"), with the possibility to replay old lectures (asynchronous access) and request new (synchronous) lectures on topics that need additional explanation.

Respondents have indicated though that priority should be initially given to instructor-led and collaborative learning forms. Learners have to be familiarized before they can be engaged into self-paced learning forms. Especially learning from others in collaborative way is important in the networked world. It improves participatory learning processes - an important approach in different fields of agricultural and rural development. Principles from social networking and Web 2.0 tools can be adopted. In addition, expert systems in the form of knowledge banks can still be considered to improve learning in specific areas like disease control etc.

The example of CGIAR is characteristic, where a short course on research methods has been taught using a blended approach. During the six weeks of facilitated online learning, the instructors engaged the learners in discussions using various resources, both instructor and student developed, as a basis for this. Several materials were also given as references or further reading (links, video, Word or PDF files, slides, etc.) that allowed learners to learn at their own pace and discuss with resource persons and this course also allowed participants to learn from each other. After this, a one-week face-to-face problem solving workshop was organised to address individual learning needs (through 'clinics') and outstanding issues not covered online.

3.4 Delivery medium

Question posed: Which would you consider as more appropriate delivery mediums for these learning resources? E.g. would it be mainly through Internet, by distributing CD-ROMs, and/or by distributing them in some printed format? You may explain why if you want.

The issue of the most appropriate delivery medium has brought forward several interesting opinions. Generally speaking, most of the participants agreed that it is not safe to presume any set level of technology availability. Access to the Internet is still very limited in many countries so that on-line delivery cannot be fully utilized. It might be good to produce a CD-ROM or DVD with resources that may be challenging to download over a poor Internet connection. Learners also still like hard copy of some learning resources for future reference. Provision for downloading the printable documents should be made.

In the future, participants expect Internet to become the most appropriate delivery medium, once a good ICT infrastructure will be in place. It can then be the primary medium since it provides reach, richness and most importantly the ease of updating information.

An interesting remark made by one participant is that all CD-ROMS, DVDs and print are simply an interface to the same digital information. If there is a plan for continuing to create the digital core, then things can be found, adapted, adjusted, adopted, reformatted so that they get wherever they need to be delivered.

3.5 Main obstacles

Question posed: In your opinion, which are the three main obstacles to the widespread adoption and use of digital learning resources by the learner communities that you described above?

The main obstacles reported by the respondents are the following:

- The lack of suitable Content. There is no suitable digital learning material to offer a course in any field of agriculture and rural development.
- The cost of suitable Content generation. Effort in terms of time, money, and expertise is required to do this. Institutions may have to invest lot of money and engage experts to develop digital learning content.
- The lack of awareness/information regarding the availability of such learning resources.
- Teaching/training communities should be motivated. Extension staff should be trained to teach the new way of producing learning materials. The ministries can reserve more fund or budget to improve their educational and publication departments.
- The life cycle of Development-Testing-Modifying-Delivering good learning resources is quite time consuming and cumbersome.
- Often financial support may not be available for the entire project period and it is possible that some projects are shelved before they are fully utilized by their potential users.
- Since one category of potential learners is farmers (who have sometimes limited computer literacy), language and literacy are also constraints.
- Bureaucracy: money is around but it attracted a new layer of "experts" and consultants.
- Life for teachers has not been easy, as a result of excessive policy-led changes (this led to a parliamentary inquest this year)
- We found teachers are interested in following information literacy courses.
- ICT and Internet availability in many developing countries (lack of good computing facilities, power supply, communication infrastructure). Still there are problems of connectivity. Operation of appropriate ICT tools at the grassroots level is also challenge. Capacity of using ICT tools by the field level functionaries and especially by farmers is another obstacle to the widespread adoption and use of digital learning resources.
- Change in mindset on behalf of many resource persons and learners more used to classical (face-to-face) teaching methods.
- The cost involved for developing countries to embark on this on a large scale.

- Quality and accessibility of digital learning materials (e.g., often not properly designed for on-line / on-screen use).
- Inadequate institutional support.
- Conservatism of some training institutions/academics - slow to adopt new technologies and teaching methods. There is a need to change the way capacity building programs are organised by the institutions. Trainers also need to change their way of imparting training. There is a need to orient towards e-learning tools and methods. Institutions should also change their training strategies and start offering at least some training programs on e-learning platforms. Encouragement should be given for undergoing online learning courses. Easy to use open source software tools to create institutional repositories and launch e-learning programs should be popularized among agricultural institutions.
- Concerns about that resources on the internet are not proper academic materials and over students' ability to evaluate what they find.
- Lack of such a community and unfamiliarity with this way of education.
- Lack of decent living conditions.
- Lack of access to technology in general (especially electricity).
- Lack of "digital competency" (familiarity with computers).
- Grassroots re-orientation and senior policy-maker re-orientation to work on the systems.
- Widespread usage of digital learning resources has not taken place due to the unintended over emphasis on media over content. Since users who need the information do not find the content informative and attractive, usage has been restricted to a small group of innovators.
- Inability to clearly define the target group for whom the information is intended is another limiting factor. As a result, the information being provided does not meet user requirements thereby perpetuating low usage. A proper segmentation of the users has to be done and information needs assessment carried out. Subsequently, content has to be designed utilizing the technologies available to make it an interesting and rich experience for the user.
- Lack of relevance of information / interaction to their immediate needs is another factor that has prevented a mass adoption of these resources.
- Quality and availability of the learning resources is the most important obstacle in my opinion. We have to design more and more quality learning objects for especially undergraduate level students. More and more simple and interactive resources for the farmers, in order to demonstrate the breeding and growing techniques.
- The need to shift from 'provider' or 'supply' based approaches towards 'learner centred' – 'demand driven' development and delivery of digital learning resources.
- Willingness to share the content, experiences and knowledge with no restrictions of IPR.
- The need to develop and deliver learning resources using multiple and multi-media options that suit the need and the context.

4. Phase 3: Repositories with open educational resources

Moderator and Rapporteur: Amee Godwin (OER Commons, Institute for the Study of Knowledge Management in Education, USA)

The 3rd Phase discussed issues related to repositories with open educational resources (OER) for agriculture and rural development. More specifically, it sought participants' feedback about learning resources and repositories on agriculture and rural topics, and the importance and challenges around "open" resources and their potential impact on teaching and learning.

4.1 User or creator of OER

Question posed: Are you a user or creator of open educational resources (OER)? Does it matter to you that resources are "open" (can be shared and modified) versus using a repository that states something like, "No material on this web site may be copied, downloaded, disseminated or published without the prior written permission of XYZ authority..."

What benefit do you see for agricultural and other learning materials being open and shareable through alternative licensing? Is copyright the issue here - is it a policy issue that needs government or other support for open content to have an impact in your country or region? What grassroots activities might be having an impact? What are the main obstacles to open?

Over half of the ten respondents to this question had some direct experience creating or using OER content. While a couple of respondents were not regular users or creators of OER, all respondents were aware of OER and the potential implications shareable materials would have for the agricultural learning community. One respondent, a creator of OER under a Creative Commons license, expressed strong enthusiasm for "openness and modifiability" as "key issues to enhancing the quality of the web as a global learning environment". Examples of respondents' experience with open resources fell along a continuum, from the repository with harvestable metadata to traditionally authored courseware and scientific research to collaboratively authored Wiki-based content.

Several respondents reacted to the concept of "open" and issues of authorship, copyright and permissions around modification with a mix of wariness and interest. For example, one respondent pointed out "the issue of modification can be different, since it depends on the way the work that we are doing is accredited (e.g. using some Creative Commons license)". While another respondent reported "having open and shareable material is highly desirable to help grassroots level. ...However, unauthorized modification of the content, misuse and piracy should be guarded against". Similarly, a creator of a website, the main purpose of which is to "collate, compile and present information on best practices for genebank management in a uniform/friendly and useful way for 8 common crops of the CGIAR genebanks" has been investigating this issue. This group expressed concern about spam and quality control of the information "if the resource was open for change or modification by just anyone". This group has considered designating a group of people with particular expertise to approve/refuse any changes for their own resources, with the intention that material that is made open is approved as useful.

Acknowledgement was also a key issue among respondents. Issues associated with the interpretation by others or the potential misuses of data were generally viewed as an obstacle to OER use and creation. One respondent notes "We do understand that in a number of cases

the Centre scientists producing certain materials will want to be acknowledged for their work and may have concerns that it can be taken out of context when reused and thus we must be careful that contributors do feel confident that their resources are put to good use.“ In particular, as the majority of contributions of OER were assumed to be coming from scientists, the respondent expressed some resistance to make unpublished results public. Another respondent notes “Since the producers of our learning resources are scientists, they sometimes fear that by publishing their research outputs as learning resources, these cannot be published in peer reviewed scientific publications. The challenge here is to work with the scientists and make sure that the information becomes available also for training and education without compromising their scientific integrity.” Such a stance may be seen to hinder, rather than help grassroots organizations.

Other challenges to OER contributions that respondents mentioned include existing institutional policies, lack of reward and peer review mechanisms, access to hardware, software, skills, Internet connectivity and institutional support particularly among those authors originating in the Global South. Respondents in this region have the potential to benefit from OER, but a lack of effective learning systems is seen as a constraint to access and participation. One respondent was concerned with the definition of OER and felt that the question should be restated to ask, “What is the niche for public domain course materials?”

Positive perceptions about OER from respondents were accompanied by insightful suggestions about awareness and acceptance raising among higher ed institutions, government partnerships and IT initiatives, such as those occurring in India. In this case, OER and distance learning have the potential to reach students, farmers and others in new ways to “create such web-based or video learning materials on topics of relevance at the grassroots level. These efforts would not only help the farmers-extensionists-researchers to solve repetitive problems in the field but also help create the most authentic information from the public institutions.” For this respondent, OER doesn’t end with the content, but is part of a larger context for learning and training: “There is a need to create awareness on the individual as well as the institutional benefits of open learning resources. Faculties in the research-extension-education-training institutions in the field of ARD need to make efforts to convert their learning resources into open courseware. It involves lot of investment, time and special skills to convert content into syllabus, training modules, assignments, further reading materials etc. This perhaps re-engineer [sic] the way institutions conduct training and capacity building programmes.”

4.2 Change of roles

Question posed: Given that some resources are open, does this change the roles of teacher, learner, expert? How can seeing a wider range of individuals as experts or contributors to evolving learning resources make a difference? What is the role of repositories in light of the potential for creative and continuous improvement by users of resources, versus being a static archive?

While most respondents felt that the roles of teacher, learner and expert do change in an OER system, quality control and how an individual uses a resource seemed to be the driving factors for role change, whether a repository or an individual teacher, learner or expert. Allowing users to add context about use to learning resources and the potential of creative and practical contributions from users are seen as resource improvements and enhancements overall. For example, a respondent explained, “Ideally open resources should be developed by those using them for teaching, and they should get better by incorporating practical experiences and feedback from users.”

One respondent notes, “there is great benefit to have a more dynamic site, allowing different users to contribute... but care must be taken to the quality control.... [further] resources can mostly be enriched through reuse and contextualization...it is up to the individual user to see what value they have in a specific context and how they can be adapted to specific learning environments”. Another respondent notes that in their view, ‘the main difference is the fact that learners can also produce their own learning resources (e.g. photos or videos of cultivations, descriptions of a good practice or advice that has worked successfully for them, etc.) advancing in this way the body of knowledge that is shared among the community. To this end, the role of repositories can be critical by (a) providing an online space for uploading, storing and organizing personal collections of learning resources, (b) facilitating users' access to learning resources, and (c) complementing services that will help the creation of communities of learning and practice around these resource pools.” Another respondent felt that “by being allowed to modify the material, such a pedagogical fit to the relevant learning context can often be achieved and then assessed by harvesting the experiences of use. The repositories then become dynamic resources for improvement of the learning experiences, and not only academically impressive knowledge repositories which are locked into a traditional mode of learning delivery that does not reach outside of academia.

Ultimately, respondents felt that “the openness of educational resources provides opportunities for collaborative content development through truly participatory approach, which is bound to blur the roles and responsibilities of a teacher, learner and expert. Further, those institutions will also be impacted by OER, and in the AGD field, OER will hasten or force a change in the way education, capacity building and training programs are conducted.

4.3 Desired collaborations and connections

Question posed: If the value of open educational resources is in fostering innovative learning among more participants, what collaborations between organizations with resources, creators of tools and technologies, and users would you like to see? How might OER and the processes involved in connecting groups and people to learning resources change agriculture?

The respondents overwhelmingly felt that OER and the processes involved would greatly change agriculture in many ways, and would open learning resources that would greatly foster learning in the field, but not without forcing some change among the many different stakeholders.

One respondent notes “Users will have great learning advantages. They can get right information from the right institutions. Institutions having rich resources will have strategic collaborations with other institutions in creating learning resources.... Open learning culture fosters application of knowledge at the grassroots level. And continuous improvement of resources through institutional gateways helps creation of authenticated information”. In particular, rural communities would likely benefit greatly.

With respect to the field of agriculture, “the potential from sharing and reusing knowledge that is produced in some other part of the world is huge for agricultural stakeholders, especially compared to the past (when expert knowledge was difficult to share and disseminate). On the other hand, this can easily lead to an information overload that could eventually "scare" potential learners away.... New roles have to be found for stakeholders like the extension officers: they can produce new knowledge, guide farmers in finding and

using resources online, help them share their own experiences with their peers on a regional, national, or international level.”

Lastly, while OER might connect groups, there is a definite need for “change in attitude by donors, major international actors such as the CGIAR and FAO who have the global (public good) content and the NARS. These organizations have to fully support the open learning approach in agriculture”. This respondent continued by noting that there is a New Agriculture.... that “is more knowledge intensive and without access to new knowledge and learning systems, global challenges in agriculture, especially in increasing food production, productivity and equitable profit to all in agricultural production chains cannot be addressed. Access to new knowledge and learning to use it effectively will change agriculture.”

4.4 Envisaged scenarios

Question posed: As a thought experiment, view the concept map linked here on the subject of pollen....Imagine if learning repositories, research papers, practitioner wisdom, news, cultural issues, critical thinking and discussion on this subject could be connected along all these paths and more.... What happens when we connect and blur the separations that exist between repositories, resources, and teaching, to open up other pathways to getting and sharing knowledge? Do you see benefits? Challenges for going forward?

Again, responses to this question were mixed depending upon the stakeholder involved. One respondent loved this approach, noting that “such efforts promote integrated view and understanding of a subject, especially domains like Agriculture which call for a multi-disciplinary approach and also a heterogeneous group of people involved”. While another found the concept map to be overwhelming and suggested “having the main menus (first or second levels) showing and the other levels behind”...noting that the logic is good but the presentation not friendly.

In terms of connecting and blurring separations, some respondents noted that such blurring can “can only benefit learning but again it will be up to the end-users to decide on what and how they want to use for a specific teaching/learning context. As a plant breeder I may only be interested in some parts of this pollen concept map but it certainly helps to see the 'bigger picture'. The challenge for someone teaching breeding will be how to contextualize this learning resource so that it makes sense for her/his learners.”

While most respondents could see the potential benefits of connectivity and sharing knowledge, such advances were not without their challenges. In particular, infrastructure was touched upon again, with one respondent noting that “this requires networking of information resources, individuals and institutions. In agriculture, creation of concepts and the related content by the users or practitioners under the scrutiny of institutional gateways perhaps will emerge as an important approach in near future”. Another user noted that there were a number of obstacles to facilitating this open network learning: “Primarily, in creating such a network there must be a way of making all of the players aware of this opportunity and then finding the technology that can connect them to one another. However, if achieved this could have great potential for developing international working relationships by placing individuals on the same knowledge plane.”

Asking respondents to think outside the usual interaction with learning repositories produced very creative thinking. Some grasped the connected future implied in the semantic web. One cited work in structured information architecture, Knowledge Manifolds, and Concept

Browsers, as emergent frameworks for learning and inquiry. Another respondent first noted the challenges and then offered inventive ways around engagement: “People at grassroots or even others do have some creative ideas for developing innovative learning modules. But they lack the required skills and tools (and sometimes even time) for giving the idea a concrete shape.... Having an `Idea center' on web, to which people send their ideas and story boards and receiving comments, suggestions, additions etc from others would be a good idea. Some of these ideas could be selected (by voting!) for further work by concerned agencies or funding agencies. Or alternatively, these ideas could be taken up as project works by students pursuing various courses in agriculture, communication, animation etc. and can be tested for their usefulness too among grassroot[s] level communities.

5. Phase 4: Metadata and Ontologies for Agricultural Learning Resources

Moderator and Rapporteur: Jehad Najjar (Katholieke Universiteit Leuven, Belgium and ARIADNE Foundation)

The 4th Phase focused on metadata and ontologies for agricultural learning resources.

5.1 Familiarized with metadata

Question posed: Are you familiar with the term metadata? Can you briefly describe how metadata are used in your work/context/community?

All participants answered that they are familiar with the term metadata and that they use metadata for their daily tasks. Metadata is used for different purposes in different communities that participants belong to. The common use of metadata is for:

- Indexing and managing agricultural resources
- Identify relevant resources
- Expose resources
- Assess resources
- Enable finding relevant resources
- Sharing resources

Some participants replied that, for them, subjective metadata (annotations, tags, contextual metadata) is important information about resources because it reflects people opinion and experience with the resource. One participant stated that some people have difficulty distinguishing between metadata format and applications, between metadata sets, vocabularies and technical bindings (XML, RDF, etc).

5.2 Use of specification or standard

Question posed: Do you use some metadata specification or standard (e.g. Dublin Core, IEEE LOM, AgMES, ..other) ? Or you use a locally model? How do you use the model (as is – full model, shortened, extended,...)? Why you selected this particular model? Why you extended/or used all/part of the model?

Specification	No responses
Adapted Dublin Core	5
Adapted IEEE	1
Mix LOM and Dublin Core	1
AgMES	1

Most replies revealed that there is no common metadata specification used across all agricultural communities. Nevertheless, adapted application profiles of Dublin Core standard are the most used. One participant replied that IEEE LOM standard is used in their community to describe learning resources. Only one participant replied that they use a local metadata model and that they had no experience with standards like Dublin Core, IEEE LOM or AgMES.

Participants did not provide enough details on why they selected a specific standard or on how they adapted the standard to meet the requirements of their community. Two participants replied that the selected Dublin core because it's commonly used by other communities.

Regarding the classification of resources, AGROVOCA and CABI are used by most participants. Only one participant replied that they use ontology, a very small ontology built around topics, activities and entities that are strictly related to the activities of the organization.

5.3. Classification of learning resources

Question posed: How do you classify your learning resources?

- Do you use some public taxonomy, vocabulary or thesaurus (e.g. AGRIS/CARIS, CABI, AGROVOC) ?
- Do you use your own classification scheme?
- Do you use some ontology for the classification of your resources? If yes, which one and on which topics?
- How do you generate the metadata for your learning resources (manually, automatic, semi-automatic)?
- How you do it manually? How you do it automatically?
- Who provides the metadata (expert indexers, teachers, trainers, etc)?
- Do you enrich the metadata? How?
- Do you validate the metadata? How?

Most participants (7) responded that metadata for their resources are provided manually, using web-based forms with metadata elements of a metadata model (see the previous section). None of the communities generate metadata automatically or semi- automatically yet.

In most communities metadata is provided by trained specialists (Librarians and researchers). In one community metadata is provided by teachers and students. In most (5) communities metadata is validated manually, by experts in the domain. Two participants replied that metadata is not validated in their repositories.

None of the communities does enrichment (adding extra information after first indexation) of metadata.

5.4. Common metadata vs. mappings

Question posed: Do you believe that a common metadata model should (and would be possible to) be introduced for agricultural learning resources? Or you think mappings of all popular metadata models (standards) would be more appropriate and useful?

Participants provided interesting responses to this question. Mapping metadata elements of a community into a common known standard(s) was preferred and seen as the better approach to be followed by all participants. The responses of participants were as follows:

- With the many variations on how to produce metadata tailored to fit the specific needs of the various communities of practice the agricultural domain, a proper mapping into effective models is probably the more feasible route to making as much information available as possible.
- A common metadata model may be useful for organizing agricultural learning resources in one country, but not in wide range. Because learning resources are introduced based on regional and national needs. Therefore, a standard metadata model is difficult to achieve. Mapping between various metadata models is a better approach. In addition, mapping

between ontologies is also needed; with an executive policy to establish relations between national ontologies and the international ones.

- A mapping system would be best. It's almost impossible to get everyone to adopt a common model - it means changing systems and it may not meet individual needs.
- We do not believe in the top-down approach to metadata that results in common metadata models. On the contrary we have been working hard to enable a more bottom-up type of approach to Metadata Harmonization. In order for such harmonization to be effective, we must focus on the conceptual level, and distinguish between the meaning (semantics), the syntax (the form) and the binding scheme (the representation) of a metadata element. This can be done by developing abstract models of metadata schemes.
- Exchange with other parts at the national level is probably more important than exchange with an agricultural educational collection in other countries.
- Both approaches should be followed, as mapping could be the only solution in some situations (e.g. big repositories built with systems that do not allow to easily implement a new export in a new format, or systems with no resources and capacities to implement the change). On the other hand, a common metadata model would be the optimal solution and would also provide a unique model to which all the others (those that cannot change) can at least be mapped. Also, mapping is a good exercise prior to the development/adoption of a common model.
- Considering that we create and store metadata using different kinds of metadata tools and on different platforms used by various persons, I believe mapping of all popular metadata models (standards) would be the best way forward.

6. Phase 5: Tools and Technologies for Agricultural Learning Repositories

Moderator: Jean-Claude Dauphin (UNESCO)

Rapporteur: Nikos Manouselis (Infolab, AUA)

The 5th Phase discussed tools and technologies for agricultural learning repositories. More specifically, it particularly focused on Free and Open Source Software (FOSS) tools that participants used to design and implement learning repositories in the agricultural domain.

6.1 Implementation

Question posed: Have you already implemented a Learning Repository?

Seven (7) participants responded to this question. They have reported the following:

- The Wageningen UR is using a combination of PHP with XML/XWSLT transformations, and developing a common repository where output from Wageningen UR and from other providers (such as educational publishers, or projects where teachers produced learning materials) is stored. At this point, Wageningen users a provisional solution with tools from the Digital Library for Earth Science Education (http://www.dlese.org/dds/services/joai_software.jsp), in combination with the collaborative platform for the majority of secondary agricultural schools in Netherlands (Livelihood from Opentext).
- The KMR group at KTH (Royal Institute of Technology, Sweden) has implemented an electronic portfolio system called Confolio (www.confolio.org) based on the metadata framework SCAM (<http://project.iml.umu.se/projects/scam-repository>). It is completely based on Semantic Web technology. It is Open Source Software and licensed under GPL/LGPL. The Confolio system is presently being used as the technical basis for the archives constructed within the Organic.Edunet project (www.organic-edunet.eu).
- The University of Montreal, Canada, is using a repository to support teachers involved in implementing and dispensing teaching in Rural Development by Agriculture, Aquaculture, and Post-harvesting technology (through an International Cooperation Project).
- Cucurova University in Turkey has developed its own repository (Traglor: Turkish Agricultural Learning Objects Repository, <http://traglor.cu.edu.tr>).
- The Czech Centre for Science and Society (CCSS) has implemented a heterogeneous repository for the Naturnet Redime project portal. It includes so far a repository for forestry education, and other repositories are also under development.
- Two respondents replied that have not some repository set up yet, but are working on it, internally or with external stakeholders.

6.2 Selected solution

Question posed: What kind of solution have you used (FOSS, Commercial, or Hybrid)?

Most of the respondents (4 out of 7) are implementing hybrid systems, combining both FOSS and commercial platforms. Two of them implemented FOSS ones that also allow serving existing commercial platforms. The respondents that plan to implement repositories in the future have expressed their interest to adopt FOSS solutions only.

6.3 Need of tools

Question posed: What are the FOSS Tools the most needed?

The participants indicated that the following FOSS tools are mostly needed:

- Tools that enable teachers to integrate resources that they find in a repository with material they make themselves (assessments, schedules for classes or whatever is needed to offer to the learners as an integrated package). E.g. tools like Reload (<http://www.reload.ac.uk/scormplayer.html>) that will allow them to integrate resources into SCORM packages. In the Netherlands several parties are also working at the development of the tool “Content Corner” (<http://www.contentcorner.nl/>, in Dutch).
- A semantic annotation tool that allows the user to apply a mix-and-match strategy for using elements of different metadata standards - and to introduce community-specific metadata elements on top of that. Most of today's generic annotation tools for semantic web metadata (RDF) are designed for experts. People with no or little knowledge about RDF are therefore forced to use simplified and often domain-specific tools that work with fixed sets of metadata elements. E.g. the Annotation Profile Model (<http://portal.acm.org/citation.cfm?id=1344591.1344594&coll=ACM&dl=ACM>) as a configuration mechanism from which annotation tools can be automatically generated.
- Existing open source tools should be further adopted (such as Moodle, Web Editing, OpenOffice, eXe, Videolecturing,...).
- Good document management systems compliant with the most widely used standards, possibly with a web interface and capable of:
 - importing vocabularies from XML/RDF/OWL files (need to use agricultural subject vocabularies);
 - implementing the OAI protocol;
 - customizing input and output formats (need to use additional agriculture-specific metadata sets).

6.4 Acceptance of commercial tools

Question posed: Would you accept to use Commercial/Proprietary solutions for dealing with Open Source Educational resources?

The majority of the respondents have taken what was referred to as a pragmatic approach to these issues: “Whatever works is fine”; “one cannot always ride a high moral horse (for example, insist on all things Open Source)”. Nevertheless, it has been highlighted that the more open and freely accessible a repository is, the more it will be used (provided the quality is the same as the proprietary ones). This is why initiatives such as OAI (Open Archive Initiative) and OER (Open Educational Resources) are so important.

The participants wanted to also highlight the difference between concepts like Free Software and Open Source Software. The former is based on an ideology and the latter is based on a pragmatic development methodology. There is a common misunderstanding that there is an opposition between open source and commercial software. In fact, some very successful commercial projects (such as MySQL, and JBoss) are based on open source.

Another point made by one participant is that the terms Commercial and Proprietary should not be used together. For this participant, Proprietary is understood as something that is not interoperable. Thus, the question should be better formulated as Interoperable or Proprietary.

Since FOSS brings profit to IT specialist, this participant considered this question as non-important: for instance, he reported own experience from several organizations have started maintaining their own FOSS system, and after some period outsourced it to local commercial SMEs.

6.5 Guidelines/recommendations

Question posed: Would you have guidelines or recommendations to facilitate planning and tracking of a Learning Object Repository project?

About half of the respondents reported having already some form of guidelines or recommendations for setting up and tracking a learning repository project. On the other hand, they did not feel that these are mature enough to be shared with other groups or communities that are working on similar projects. The rest of respondents expressed their interest in developing and/or having such guidelines and recommendations, appropriately adapted to meet the needs of their organizations.

6.6 Interoperability

Question posed: Are you using interoperability standards? Which one? (SCORM, EML, OAI or ?), which one would you recommend and why?

The main interoperability specifications and standards that have been reported are the following:

- OAI-PMH to allow harvesting of metadata from other repositories;
- SRU/SRW, FIRE/LRE, and SQI to serve external/federated queries;
- Plain HTTP using RESTful Web Services;
- Dublin Core (DC) and IEEE Learning Object Metadata (LOM) for metadata.
- SCORM for content packaging;
- IMS specifications for various purposes.

6.7 Technologies

Question posed: Which technologies are used to access information? :

- Metadata Exchange Protocols (OAI, Z93.50)
- Query Languages (SQI)
- Web Services
- Learning Management Systems
- Syndication (RSS/Atom)
- Other?

Most respondents reported that their repositories use OAI-PMH (but also Z93.50) to allow harvesting of their metadata. The Confolio/SCAM repository can also be syndicated using RSS feeds. The TrAgLor repository is offering pilot access to its content through Web services (based on WSDL and SOAP technologies and standards), as well as RSS syndication tools.

7. Phase 6: Promotion and Use of Agricultural Learning Repositories

Moderators and Rapporteurs: Krishna Alluri, Wayne Mackintosh, and Anil Kumar (Commonwealth of Learning, Canada)

The 6th Phase dealt with the promotion and use of agricultural learning repositories and agricultural Open Educational Resources (OER). The suggestions and views of the participants are consolidated under each query which led the discussion process.

One general suggestion that can be taken as a **flagship resolution** of the discussion is the necessity of building a sustainable, self regulated and farmer centric community of subject experts (including Teachers, Agricultural Officials, Researchers, ICT Experts etc), devoted extension workers and real farmers to bridge the gap between Knowledge (both AgL and ICT) and real farmer.

7.1 Access

Question posed: Given the potential of ALR and OER, how do we bridge the digital divide especially for communities and learners who do not have access to the Internet (and computers) so that they could contribute to and / or use ALR and OER?

For the above query members have suggested many workable solutions. The suggested solutions can be grouped into Printed Materials and Audio Visual Materials, Setting up of Access Centres/Kiosks, Use of Mobile Technology, Requirement of Co-ordinators/ Extension Workers and Co-ordinating the activities of Governments and Various Other Potential Players as given below:

7.1. A: Printed Materials and Audio Visual Materials

Suggested activities

- Print and distribute fliers, magazines etc that are being prepared using the repositories.
- Promote printed repositories through Libraries.
- Develop programs to print the repositories very easily like wiki-pdf technology
- Prepare audio and visual materials based on the repositories.
- Distribute them in suitable media like CD

7.1. B: Setting up of Access Centres/Kiosks

(Eg: Akshaya project of Govt. of Kerala, India (www.akshaya.net) and Access Centres under L3 Farmers project)

Suggested activities

- One ideal solution to overcome the connectivity problem is the setting up of access centers/ kiosks. These centers may be provided with web access on priority basis.
- Even without web access these centers can be run with a PC and other audiovisual equipments to present the audio/visual materials produced based on the repositories.
- These centers can be developed into training cum multi-service centers in future.

7.1. C: Use of Mobile Technology

Resources designed around or making use of cell phones is immensely helpful in connecting them to the mainstream Internet resources. It will also be a feasible solution for difficult areas to be got connected.

7.1. D: Requirement of Co-ordinators/ Extension Workers

Services of devoted Co-ordinators/ Extension workers to run the Access Centres/ Kiosks as given above is of crucial importance. They can also bring the farmer community members to centers.

7.1. E: Co-ordinating the activities of Governments and Various Other Potential Players.

In order to establish ICT infrastructure including accessibility in time bound manner, facilitate content development, content validation etc the potentials of the Government and other players in the field have to be tapped to the maximum extent possible. For This to happen all these agencies required to be coordinated to a collaborative working environment.

For example initiatives like the KVK-Baramati in Maharashtra, India operates through a portal aAqua (<http://aaqua.persistent.co.in/aaqua/forum/index>) and provides facility to scientists to share expertise and use mobile phone technology SMS to reach out farmers and the efforts of Deccan Development Society (DDS) (<http://www.ddsindia.com/www/default.asp>), which advocates community radio and video etc have to be encouraged and replicated.

Similarly effective awareness campaigns are required to be launched among the knowledge community (academicians, researchers etc) to encourage them to share their works in open platforms. Access to content and connectivity required to be made a right through proper legislations.

7.2 Capacity

Question posed: The untapped potential of ALR and OER for learning lies in the ability to remix and repurpose content for different contexts -- sadly the ALR and OER movement does not have an impressive track recording in this regard. Taking the unique demands of the agriculture sector into account -- what are the enablers and/or barriers to build capacity for sustainable reuse of ALR and OER.

The suggestions of the participants on this query can be grouped into Training Policy, Licensing Policy, Indexing, Increased Funding, Collaboration and Paperless Events as given below:

7.2. A: Training Policy

ALR and OER movement should have a general training policy like the **Learning for Content (L4C)** model developed in Commonwealth for building capacity in relevant ICT skills for teachers, lecturers and trainers to participate in ALR and OER development activities.

The Learning for Content (L4C) model developed in Commonwealth of Learning for its WikiEducator project could be an ideal choice for replication (<http://www.wikieducator.org/Learning4Content>). In Learning4Content initiative, with the funding support from the Helwett foundation, COL provides free training skills in return for a small contribution of knowledge back to the community.

7.2. B: Licensing Policy

Openness and liberty are the two basic conditions that provide moral as well as legal standing for promoting continued use, revision and remix of repositories. Therefore a proper open license like Creative Commons Attribution Share Alike license (<http://creativecommons.org/licenses/by-sa/3.0/>) required to be ensured for all content in the repository.

7.2. C: Indexing

Easy spotting/identification of required content will be automatically promoting use. An effective indexing is very much required to make the content in a repository easily identifiable. Therefore properly planned and organized efforts are required to develop proper indexing methods and implementing the same in all existing as well as prospective repositories.

7.2. D: Increased Funding

Availability of funds for promoting usage of repositories required to be ensured/increased. Governments, Institutions and Funding Agencies may be encouraged to provide more funds to create open repositories and promote its use, especially among farmers.

7.2. E: Collaboration

(Suggestions on this item are consolidated under the 6th query on Collaboration)

7.2. F: Paperless Events

To promote the use of online repositories and other resources, in areas where accessibility is not a problem, all the events related to ALR and OER may be organized in a paperless way. That is all communications; citations, reference materials for the even as well as report of the event etc will be online.

White papers, proposals, projects etc may be encouraged to be presented online. The Pan-Commonwealth Forums are a replicable example.

7.3 Quality

Question posed: Is quality important? If so, what are the challenges to achieve quality? How do we ensure quality inputs to ALR and OER development?

The suggestions of the participants on this query can be grouped into Quality Vs Access, Quality Standards and Sustainable Quality Management as given below:

7.3. A: Quality Vs Access

Participants opined that better access will bring in better quality. Better access will attract more users to the ALR and OER. More users mean more feedback, suggestions etc. That in turn will improve quality. Therefore better accessibility required to be ensured for better quality.

7.3. B: Quality Standards

Though ALR and OER is too large an area to cover under simple quality definitions, we have to set some general quality standards for content development, revision, moderation, remix etc. It will make the process easy as well as increase reliability. General standards may be arrived at for the different aspects of quality such as quality of content, quality of pedagogical approach, quality of interaction etc.

7.3. C: Sustainable Quality Management

Sustainable quality management tools and systems have to be developed to ensure quality of ALR and OER. Since quality is highly depended on the time, quality assurance should be a continuous process. Following are the suggestion of the participants in this regard.

- Quality Circles: The potential of the human resources and technology infrastructure available with the ocean of Universities and Colleges in the world can be tapped to ensure quality of ALR and OER. Quality Circles for ALR and OER may be promoted in Universities and Colleges.
- As an incentive, some internationally recognized accreditation system may be instituted for Universities and Colleges for promoting and Quality Circles and its proper functioning.
- Feedbacks are another most important tool for quality management. A permanent system for collecting and analyzing feedbacks required to be in place. This may also include facility for ranking the content for quality/relevance etc by the users. Individuals and

Institutions may take part in it. The quality circles as given above can coordinate these activities.

7.4 Interactivity

Question posed: Since built in 'interactivity' feature in the content is known to contribute to learning, how can we make the ALR and OER 'interactive'?

The suggestions of the participants on this query can be grouped into Language Vs Interaction, Built-In Features for Interaction and Interactive Games as given below:

7.4. A: Language Vs Interaction

Availability of the ALR and OER in the mother tongue of the real farmer will definitely promote interaction. Face to face method will be one of the solutions to this language barrier. The facilitators/ extension workers, with the help of other expert people may translate any language content and present it in the mother tongue of the farmer before them.

7.4. B: Built-In Features for Interaction

The discussions show that there can be two broad types of interaction for ALR and OER

1. Face to face interaction: That is to take the ALR and OER content to formal/informal interactive sessions like group discussions, workshops etc by facilitators/ extension workers and
2. The inbuilt interactive components to ALR and OER

Suggested activities:

- Each individual item of an ALR and OER is required to be interactive to make the whole system interactive
- At the level of repositories, the most interesting interactive features could be:
 - the ability to select courses / units / lessons/ objects and create custom learning paths (which can then also be used by other learners);
 - some feedback mechanism, like ranking and reviewing resources.
- Local language IVRS, it is applicable to both individual content items as well as the whole system of ALR and OER
- Options for Audio/Video chat with experts available online in each language.
- Options for the farmer communities to share their experiences related to the specific ALR and OER components.
- Options for putting queries/ tags, either by recording the same of typing, and get reply on a later time.
- Access points with touch screen monitors in public places.

7.4. C: Interactive Games

It was also suggested that interactive games would be very much useful for all age groups. Therefore actions may be initiated to develop interactive games based on real farming experiences.

7.5 Quantity (rapid development)

Question posed: Based on your experiences, which content production approaches should we be using to scale-up ALR and OER development? For example, do we consider classical academic models like course development, open versus closed authoring approaches, peer collaboration models, non-formal approaches and others?

The discussions show that Collaboration and sharing is the most effective method for rapid development of ALR and OER. Suggestions in this respect are:

- Open licensing policy is the prime condition for rapid development.
- Modular approach: the entire topic may be divided into independent modules so that getting collaborators will be easier.
- Content should be made available in multi-format with interactive non-formal format as default one. Classic models will ensure use of the same in academic institutions. But it has to be informal to ensure the use of the same by real farmer. User will have the option to select the format.
- Participants generally approved Peer collaboration as the fastest one.

7.6 Collaboration

Question posed: Many individuals and institutions are developing ALR and OER. How can we make them collaborate in promoting the ALR and OER for the development and welfare of agricultural and rural populations?

Collaborative ways are the ideal choice for content development, revision and remix etc. The concept behind WikiEducator Project of COL is an ideal strategy that can be replicated to other projects also. That is, a sustainable community of educators, extension workers and actual practitioners is being created along with the development of content.

Collaboration is the life and blood of any sustainable development activity. An effective co-ordination system is required to be in place to make the initiatives of various agencies complimentary/ supplementary to one another. As part of coordination a repository on live initiatives by various agencies may also be maintained.

To encourage collaboration, widely disseminate information on participating the online collaborative content development forums like www.wikieducator.org and eDiscussions platforms like AgLR-TF to get as many organizations involved in the conversation as possible.

Suggestions for effective collaboration in content development, revision and validation:

- Implement a system in collaboration with Universities that necessitates submission of valuable content after sufficient consultations by students, and validated by a responsible teacher, mandatory to complete Post Graduation courses etc.
- Accreditations for universities for promoting quality assurance/ content validation of online ALR and OER
- Make people to submit papers open and online under suitable licensing policy for events (as being done for Pan-Commonwealth Forum on Open Learning)
- Submission of a valid content (online and open) may be insisted for Institutions/Individuals/NGOs to apply for financial assistances etc. each time.
- Awareness about open source options available and the services put in by devoted volunteers for developing such applications will also be helpful in promoting collaboration.

- Promotion of the options like eXe in academic and extension institutions so that open content can be downloaded from wiki etc for use and remix in LANs. It will also help to overcome difficulties in web access.
- Most important of this is collaboration between the knowledge/technology community and real farmer. There will be instances where a person who can act as a middleware to translate the technology to the farmer and vice versa. Only through building an effective community of real farmers, extension workers and academicians this problem can be solved.

8. Phase 7: Conclusion and Next Steps

Moderator and Rapporteur: Gauri Salokhe (Food and Agriculture Organization, Italy)

The 7th Phase concluded the e-Conference by asking questions related to the next steps of the AgLR-TF. More specifically, it discussed possible follow up steps or Terms of Reference for further work by the Task Force. In this closing phase, participants' feedback was sought about their expectations from the AgLR-TF, as well as the pros and cons of the e-Conference.

8.1 Outcomes

Question posed: What you would you generally like to see coming out of such a Task Force?
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The main suggested activities for the Task Force were:

- Implementation of the discussion and more viable activities which will boost the development of the program.
- It should serve as medium for different learning repositories to develop a feel for other knowledge bases and to begin to map out in which areas various organizations specialize. It should also provide means for sharing lessons learned in making information more accessible. Many Service providers meet similar problems and thus, sharing experience new service providers avoid some of those common problems or at least minimize time consumed for solving those problems.
- It should provide leadership in promotion of OER in Agricultural Research and Development, especially to convince Universities to participate following the model of OCW from MIT.
- The TF should also bring together relevant projects from different countries and make them available via the website for easy networking and collaboration.
- TF should provide guidance and assistance to those who are not really experts in these areas so that ultimately agricultural information becomes more easily accessible for variety of purposes, including learning for agricultural development.
- The TF should provide practical examples through use cases so that this becomes a useful exercise in the context of everybody's day-to-day work and not a 'solution in search of a problem'. On the same note, it should consolidate workable solutions for different aspects of AgLR, and pursue them to implementation, continue with expert support to implementers.
- The TF should provide recommendations on Advocacy for AgLR; capacity development to establish, manage and contribute to AgLR as also use them; Standards, Norms, regulatory mechanisms such as on Repository Security and IPR; Systems (tools/soft wares used successfully); Global and National Governance structures that contribute to setting up of infrastructure etc. for LR.

8.2. Potential members

Question posed: Who else should be invited to follow the activities of the Task Force?

The following suggestions were received for extending collaboration of the Task Force:

- Specialists in agriculture and Rural Development

- Librarians (such as IAALD)
- Communication coordinators
- ICT Engineers
- Individuals with expertise in computer
- Teachers/Educators/Trainers and Learning Designers
- Nongovernmental organization at National level and International Level.
- Anybody who is involved in agricultural learning and in need of information - universities, training centres, extension services, research centres.
- Organizations that represent Civil Society, Farmers, Rural Women, Youth and Private Sector interested in agricultural development
- Donor/Philanthropic organizations
- Anyone who are directly responsible for big repositories where a large amount of learning material is available
- Forest community

It was noted that one of the common weakness of all developmental activities as seen over the years, in governments as well as NGOs, is their failure to effectively coordinate/communicate with similar activities elsewhere, revise/remix/reuse the existing resources, utilize past experiences etc. This necessitates reinvention of wheel again and again at the cost of the valuable resources and time. This question should find a solution for effective coordination between different activities so that they are made complementary/supplementary to each other.

8.3 Activities

Question posed: What kind of activities could be taking place? (e.g. providing guidelines, regular discussion issues, information about upcoming events, etc.)

It was noted that there are two types of groups involved in the TF - those active in ICT-KM and more interested in the 'technology' and those using the technology either by adding or contributing resources and making this useful for their day-to-day work. If the information, guidelines, discussions, events etc will focus on IT related stuff, the second audience may loose interest sooner or later. A balanced approach will be needed. Case studies and good or bad examples on how this is used in a practical environment will be of interest - how did a specific institution make use of the technology to improve its service delivery in agricultural learning, extension or development.

The following suggestions were also provided by the participants:

- Participants can suggest other topics of popular interest for further discussion.
- If possible in addition with the summary provide us with unedited versions of the inputs.
- Regular workshops to share and implement ideas from various stakeholders, regular discussion forums, more e-conferences as well as information about upcoming events.
- The AgLR-TF should produce a set of metadata guidelines to make information more accessible to developing country users and researchers.
- Create Wiki spaces for collaboration and sharing on each of the concerned subjects, to encourage each one to be active member.
- More discussion related to climate change and its impact on agriculture; current food crisis; and issue of aging farmers in rural areas.

- Create and maintain an up-to-date repository of all AgLR related initiatives being implemented by different agencies.
- Venue may be set to asynchronous or synchronous discussions with implementers of such initiatives.
- All activities that contribute to objectives and rather than having generic discussions, working groups should be formed to discuss specific topics such as recommendations on advocacy for AgLR; Capacity development to establish, manage and contribute to AgLR; Standards, Norms, regulatory mechanisms such as on Repository Security and IPR; etc.

8.4. Virtual events

Question posed: Would similar virtual events on specific topics, such as discussion around metadata or free and open source software, be of interest?

Most participants agreed that similar virtual events, when they bring about useful discussions and fruitful results, are a good idea. More specifically, the following topics for further discussion were suggested:

- Metadata
- Open Educational Resources which could lead to Open Learning/Teaching Resources, including study cases, learning activities, etc.
- Sharing of Best Practices and success stories
- Open source software/systems
- Institutional issue

The discussions would be better done in small focused groups.

8.5 Working groups and topics

Question posed: Would you be interested to participate in or lead working groups that look at specific aspects of agricultural learning repositories management process? Which topics would be of interest for further discussion?

Most participants who responded to this question also agreed to lead discussions. The specific issues of interest are:

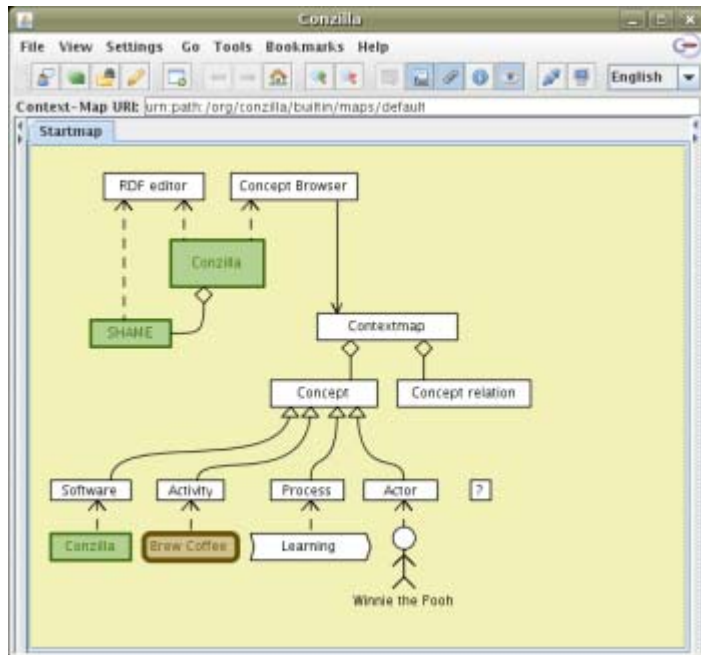
- To discuss issues pertaining to methods of information dissemination to other groups without access to Internet so that they can also benefit from this Task Force.
- SANREM would be interested in participating in future sessions, particularly those relevant to the promotion and sharing of information between AgLTRs. We are also open to discussions on how to make existing resources more available to the developing world.
- To discuss issues on Model to transform existing OERs to more Open Learnable/Teachable Resources, and to create New Knowledge in Ag-RD domain as well.
- Rural Agriculture and the impact of the peasant farmers in the rural areas and the Agriculture production across developing countries and suggest ways of having a different partners programmes in some of the developing country such as Ghana and Nigeria.
- Open Education Resources, Learning Management Systems and how they relate to LOM, RLOs and repositories.
- Institutional issues in establishing, managing and enabling use of AgLR.

8.6 Co-located events

***Question posed:* Many of us are part of associations such as Dublin Core and IAALD, should we organise some side events in collaboration with them to ensure savings on costs?**

Most respondents agreed that this would be a good idea. It will also provide opportunities for collaboration and will help move the group forward. It might also bring about opportunities to seek funds from donor agencies and establish a platform to use. One respondent suggested that efforts should also be made to invite policy makers in the Government and people from the private sector.

Appendix A: Viewing the Conceptual Map of the Discussions



Dr. Ambjorn Naeve has developed a conceptual dialogue map of the discussions using the Conzilla software tool. In order to navigate this map, someone should first download the Conzilla concept browser at <http://www.conzilla.org> (click on "Download" and then on "Launch"), start the tool, and then copy the following URL into the address window (Context-Map URI field, above the yellow map), hit return, and then you should be able to view a map called "The Agricultural Learning Repositories E-Conference":

<http://www.conzilla.org/people/amb/projects/Agro/layoutCM#b98ef4119bd4f84c6>

It is also possible to Bookmark the address for easy access whenever Conzilla starts. Navigation instructions are available at <http://www.conzilla.org/wiki/Doc/Navigation>. By double-clicking on each "Phase-box", one can view a map that captures the corresponding phase of the e-conference.

The main idea behind the Conzilla model of the conference is that the discourse is presented in such a way that anyone can publish contributions to it in retrospect. For this purpose, each question has been connected to a special "follow-up discourse" map, where there is room for such contributions. For example, the overview map of Phase 2 looks like this:

<http://www.conzilla.org/people/amb/projects/Agro/layoutCM#e2e854119b331d860>

and the follow-up map for contributions to Question 2.1 looks like this:

<http://www.conzilla.org/people/amb/projects/Agro/layoutCM#b98ef4119bd2027e32f8>

It is reachable from the Phase 2 overview map by double-clicking on "Question 2.1". If one has problems downloading Conzilla, it is probably because there is not the required version of Java (1.5 or later) installed. The appropriate Java Runtime Environment (JRE) can be downloaded from <http://java.sun.com/javase/downloads/index.jsp>.

Appendix B: AgLR2008 Contributors

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Appendix B: AgLR2008 Keynote Speakers

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