

## **AWARENESS, IMPACT, AND USAGE OF AGRIS IN THE REPUBLIC OF MOLDOVA AND GEORGIA**

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### **ABSTRACT**

This paper analyzes the importance and impact of using the AGRIS database on researchers from two countries - the Republic of Moldova and Georgia. The study was conducted in September- October 2022, using a mixed methodology that combined qualitative and quantitative approaches. The results of the study highlight that most of the respondents are aware of the benefits and advantages of the AGRIS database and believe that it has a positive impact on the research process in Georgia and in the Republic of Moldova. Coordinated by the Food and Agriculture Organization of the United Nations (FAO), AGRIS is of real help to researchers in writing scientific publications, preparing university courses and presentations for conferences, acquiring new knowledge in a scientific field. At the same time, the study identified some constraints and barriers in the use of AGRIS, such as the lack of access to the full texts of documents, the lack of in-depth skills in information discovery, and linguistic and technical barriers. In summary, the activity of AGRIS Country Hubs in the Republic of Moldova and Georgia will focus on the development of promotion strategies regarding the AGRIS system, and the diversification and adjustment of training programs and educational resources to local contexts.

**Keywords:** agriculture, food, agricultural research, agricultural education, FAO, AGRIS, multilingual portal, database, utilization, impact, Republic of Moldova, Georgia

### **MOLDOVA VƏ GÜRCÜSTAN RESPUBLİKASINDA AGRIS-LƏ BAĞLI MƏLUMATLILIQ, TƏSİRİ VƏ İSTİFADƏSİ**

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## **XÜLASƏ**

Bu yazıda AGRIS məlumat bazasından istifadənin iki ölkənin - Moldova Respublikası və Gürcüstanın tədqiqatçılarına əhəmiyyəti və təsiri təhlil edilir. Tədqiqat 2022-ci ilin sentyabr-oktyabr aylarında keyfiyyət və kəmiyyət yanaşmalarını birləşdirən qarışıq metodologiyadan istifadə etməklə aparılmışdır. Tədqiqatın nəticələri vurğulayır ki, respondentlərin əksəriyyəti AGRIS məlumat bazasının faydaları və üstünlükləri barədə məlumatlıdır və onun Gürcüstan və Moldova Respublikasında tədqiqat prosesinə müsbət təsir göstərdiyinə inanırlar. Birləşmiş Millətlər Təşkilatının Ərzaq və Kənd Təsərrüfatı Təşkilatı (FAO) tərəfindən koordinasiya edilən AGRIS elmi nəşrlərin yazılmasında, universitet kurslarının və konfranslar üçün təqdimatların hazırlanmasında, elmi sahədə yeni biliklərin əldə edilməsində tədqiqatçılara real köməklik göstərir. Eyni zamanda, tədqiqat AGRIS-in istifadəsində bəzi məhdudiyyətlər və maneələr, məsələn, sənədlərin tam mətnlərinə çıxışın olmaması, məlumatların aşkarlanmasında dərin bacarıqların olmaması, linqvistik və texniki maneələr müəyyən edib. Ümumilikdə, Moldova Respublikası və Gürcüstandakı AGRIS Ölkə Qovşaqlarının fəaliyyəti AGRIS sistemi ilə bağlı təşviq strategiyalarının hazırlanmasına, təlim proqramlarının və təhsil resurslarının yerli kontekstlərə uyğunlaşdırılmasına və şaxələndirilməsinə yönəldiləcək.

Açar sözlər: kənd təsərrüfatı, qida, kənd təsərrüfatı tədqiqatları, kənd təsərrüfatı təhsili, FAO, AGRIS, çoxdillli portal, verilənlər bazası, istifadə, təsir, Moldova Respublikası, Gürcüstan

## **BACKGROUND**

In the context of increased vulnerability of agriculture, caused by global economic imbalance and disproportionate economic growth, globalization, and climate change, the active implementation of scientific research results, exchange of information, good practices, and agricultural knowledge have become a basic priority for ensuring the sustainability of the agricultural sector both in the Republic of Moldova and Georgia. The mobilization of these factors through the prism of achieving the objectives of sustainable development leads to an innovative approach to the development of agriculture.

The Food and Agriculture Organization of the United Nations (FAO) actively promotes open access and the exchange of information, knowledge, data, and technology concerning all aspects of food and agriculture, thereby contributing substantially to increasing the accessibility and visibility of scientific output worldwide, as well as improving the quality and effectiveness of agricultural research and education.

To facilitate access to and exchange of agricultural scientific information and data to make agricultural research outputs visible and usable globally, since 1974, FAO has coordinated the International System for Agricultural Technology and Science (AGRIS), an open and free multilingual portal with a database of over 14 million bibliographic resources available in up to 90 languages.

AGRIS, the huge collection of agricultural information resources, is the entry point to accessing the diversity of knowledge in agricultural science and technology that is available globally on the web<sup>2</sup>. Although it is designed as a bibliographic database with millions of highly structured records/references with numerous semantic relations, AGRIS has been providing full-text links to about 3.5 million documents (articles, conference papers, books, thesis, and other content types) for several years. A distinctive feature of the AGRIS database that makes it unique is the integration and reflection of information about not only peer-reviewed

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<sup>2</sup> Fogarolli, Angela, Keizer, Johannes, Anibaldi, Stefano, Brickley, Dan. AGRIS—From a Bibliographic Database to a Semantic Data Service on Agricultural Research Information. In: *Agricultural Information Worldwide*, 2010, Volume 3, Number 1, pp. 26-30. Available: [https://ecommons.cornell.edu/bitstream/handle/1813/58274/AIW\\_2010\\_v3\\_no1.pdf?sequence=1&isAllowed=y](https://ecommons.cornell.edu/bitstream/handle/1813/58274/AIW_2010_v3_no1.pdf?sequence=1&isAllowed=y)

literature but also gray literature (unpublished scientific and technical reports, theses, government publications, etc.).

The AGRIS database is representative of agricultural research worldwide in terms of the diversity and number of languages of the resources indexed in it. Using the AGROVOC multilingual thesaurus helps to discover content in various languages and transcend linguistic and geographical boundaries. A structured collection of concepts, terms, definitions, and relationships, AGROVOC is the largest Linked Open Data set about agriculture available for public use and its highest impact is through facilitating the access and visibility of data across fields and languages<sup>3</sup>.

AGRIS's development is based on dynamic partnerships of data providers, partners, and users. It is supported by a collaborative network of over 500 data providers from up to 150 countries, which collect and submit bibliographic data originating from their country for compiling and dissemination globally by FAO. The data providers are the main actors in building the AGRIS database, contributing to developing and increasing the AGRIS content on a wide variety of topics related to food and agriculture.

Starting in 2020, AGRIS Country Hubs were established as a special category of data providers, long-term members of the AGRIS network, with expanded tasks and responsibilities. Formerly known as AGRIS National Centers, Country Hubs act as focal points for AGRIS at the country and regional levels.

The development of partnerships, in particular, at the level of Country Hubs, is currently a priority for AGRIS. This was also one of the main topics in the AGRIS Virtual Annual Conference 2022 event "Partnerships: focus on the AGRIS Network and Country Hubs". At the conference, the experiences of two AGRIS Country Hubs, one each from the Republic of Moldova and Georgia respectively, were shared. The experiences focused on the benefits and challenges of being Country Hubs, as well as on the activities carried out by them.

Designated by the specialized ministries of Georgia and the Republic of Moldova as National AGRIS Centers and accumulating in this capacity valuable experience over a period of 20 years, the Institute Techninformi of the Georgian Technical University and the Republican Agricultural Scientific Library of the State Agrarian University of Moldova (absorbed in 2022 by the Technical University of Moldova) were among the first AGRIS Country Hubs. This fact is of particular importance to these institutions as well as to the countries they represent.

These organizations, as Country Hubs, support local research institutions, publishers, and librarians to raise awareness of the importance and benefits of the AGRIS system for the development of agricultural research in the Republic of Moldova and Georgia, and to strengthen the capacity to improve the visibility, accessibility, and usability of information and global agricultural data. Country Hub status increased the visibility and importance of these organizations among other organizations and institutions focusing on agriculture and opening up new opportunities and initiatives for them, both nationally and internationally. Being AGRIS Country Hubs and members of an international global network of organizations is a considerable benefit for Georgia and the Republic of Moldova, facilitating the sharing of multiple views and providing new opportunities for developing intercultural and international collaboration and partnerships.

Along with regularly providing metadata on the agricultural scientific output of these two countries, the AGRIS Country Hubs in the Republic of Moldova and Georgia have many other functions and are responsible for capacity development activities, focusing on such priorities as promoting the AGRIS system in that country, guiding eligible partners to join the AGRIS

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<sup>3</sup> Imma Subirats-Coll, Kristin Kolshus, Andrea Turbati, Armando Stellato, Esther Mietzsch, Daniel Martini, Marcia Zeng. AGROVOC: The linked data concept hub for food and agriculture. In: Computers and Electronics in Agriculture, 2022, Volume 196, ISSN 0168-1699. Available: <https://www.sciencedirect.com/science/article/pii/S0168169920331707>

network, advising existing and potential organizations on the submission of information about their resources (metadata) and coordinating capacity development activities in collaboration with FAO.

Focusing on raising awareness of AGRIS, both Country Hubs organized several round tables, information and promotion campaigns, panel discussions, and trainings for adopting AGRIS programs and improving the skills of researchers, teachers, students, and librarians in the institutions of their countries.

To overcome the language barrier and all the problems related to it while promoting AGRIS, various guides, brochures, and promotional materials were prepared and translated into Romanian and Georgian languages.

It is extremely important to establish and develop collaborations between the institutions within the AGRIS network in various countries for the effective activity of Country Hubs. The collaboration between Country Hubs from the Republic of Moldova and Georgia is based on interaction, exchange of experience, transfer of knowledge, and the joint organization of activities meant to strengthen efforts to promote regional initiatives.

In the context of these collaborations, the aim of this study is to find out the opinions and degree of satisfaction of users of the AGRIS database from the Republic of Moldova and Georgia.

## LITERATURE REVIEW

AGRIS has been constantly evolving and improving since its foundation, both technically and content-wise, as well as in terms of search services, functionalities, and facilities, to better serve all those interested in food and agricultural science and technology.

A goal of FAO's team behind AGRIS is to respond to users' needs, and the team is committed to seeing AGRIS users and data providers as clients who contribute to the continued development of AGRIS<sup>4</sup>. It is used by various categories of users in several countries worldwide. AGRIS usage statistics show a significant upward trend in both the number of users (from 6.6 million to 10.3 million) and the number of sessions (from 10.2 million to 14.2 million) between June 2021 and June 2022, compared to the period between June 2020 and June 2021<sup>5</sup>.

Although AGRIS is widely used worldwide, a review of the literature on surveys conducted in specific countries or specific institutions reveals no published studies on the use and impact of the AGRIS database. Studies on this subject were carried out, in particular, by AGRIS. To understand the needs of users of the AGRIS database, FAO periodically initiates research and surveys that aim to evaluate the opinion of users regarding the quality, the usefulness of the database and to determine the extent to which it satisfies the needs of users.

In the period from November 2014 to February 2015, the AGRIS e-consultation survey took place. The participants came from 73 countries<sup>6</sup>. Analyzing the results of the AGRIS e-consultation survey on AGRIS's usability and evaluation of new features of AGRIS 2.0, the authors Malapela, Celli, Subirats, and Keizer (2014) found that users positively appreciated

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<sup>4</sup> Celli, Fabrizio, Malapela, Thembani, Wegner, Karna, Subirats, Imma, Kokoliou, Elena, Keizer, Johannes. AGRIS: providing access to agricultural research data exploiting open data on the web. In: F1000Research, 2015, 4:110, 9 p. Available: <https://f1000research.com/articles/4-110/v1>

<sup>5</sup> Subirats, Imma. What is new in AGRIS? Presentation at AGRIS Virtual Annual Conference, 7 July, 2022. Available: [https://assets.agris.fao.org/public/2022-07/AGRIS\\_2022\\_presentation.pdf](https://assets.agris.fao.org/public/2022-07/AGRIS_2022_presentation.pdf)

<sup>6</sup> AGRIS e-consultation survey results. 2015. Available: <http://aims.fao.org/news/agris-e-consultation-survey-results>

the features of AGRIS 2.0<sup>7</sup>. Twenty-four percent of respondents were extremely satisfied with AGRIS level of service, 59 percent were satisfied and only twelve percent not satisfied. At the same time, most respondents indicated suggestions and recommendations regarding the AGRIS portal improvement, including content, interface, search services, and presentation of the results.

Another AGRIS survey, carried out in early 2022, aimed to learn and better understand the expectations and needs of AGRIS data providers regarding different aspects of it, from data contribution to useful training activities<sup>8</sup>. One hundred and seventeen data providers participated in the survey and expressed their degree of satisfaction with the usefulness and benefits AGRIS brings to agricultural communities in various countries, as well as some difficulties faced by data providers when contributing with metadata.

The major difficulties indicated by the data providers included, first of all, the fact that providers possess only basic knowledge of producing metadata - they do not have thorough knowledge of information processing – and require training. Two other mentioned issues relate to inadequate IT infrastructure and support and financial constraints that prevent the continuity of data provision activity in AGRIS. However, more than thirty two percent of data providers do not face any problems or difficulties.

For the development and improvement of AGRIS services, the FAO collects feedback, using the “feedback” form available on the AGRIS website, through e-consultations and meetings with interested parties.

## **PURPOSE AND OBJECTIVES OF THE STUDY**

The general purpose of the study was to evaluate the use of the AGRIS database in agricultural scientific institutions in Georgia and the Republic of Moldova. The basic objectives of the study included:

- establishing the frequency of the use of the AGRIS database, as well as the use of the various types of resources indexed/available in AGRIS, by researchers;
- determining the usefulness for researchers and the impact of the AGRIS database on the educational and research processes in the Republic of Moldova and Georgia; and
- identifying the major problems and constraints associated with accessing and using the AGRIS database.

## **METHODOLOGY**

To investigate the behavior of researchers, their opinions, and knowledge of AGRIS from both countries, the survey was designed and employed to collect data. Respondents were recruited from agricultural universities and research institutes from Georgia and the Republic of Moldova. The survey was conducted using Google Forms and was disseminated via email to the academic community. While the initial version of the survey was in English, it was administered in the local language of each country - Romanian in the Republic of Moldova and Georgian in Georgia. The study was carried out in September-October 2022 and one reminder was issued. The study used a mixed methodology that combined both qualitative and quantitative approaches.

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<sup>7</sup> Malapela, Thembani, Celli, Fabrizio, Subirats, Imma, Keizer, Johannes. The role of AGRIS in providing global agricultural information to boost productivity and food security. [Conference paper], IFLA Lyon, 2014. Available: <https://library.ifla.org/id/eprint/1020/1/140-malapela-en.pdf>

<sup>8</sup> Subirats, Imma. What is new in AGRIS? Presentation at AGRIS Virtual Annual Conference, 7 July, 2022. Available: [https://assets.agris.fao.org/public/2022-07/AGRIS\\_2022\\_presentation.pdf](https://assets.agris.fao.org/public/2022-07/AGRIS_2022_presentation.pdf)

Two hundred and seven people participated in the survey. One hundred twenty seven (127) respondents were from the Republic of Moldova and eighty (80) from Georgia. The survey was anonymous in order not to reveal the identity of respondents and did not collect personal information such as respondents' names and addresses.

The survey included three questions on the profile of the respondent and sixteen (16) general questions: open-ended questions, which gave respondents the opportunity to express their own opinions, close-ended questions with multiple choice options, as well as rating scale questions.

## DISCUSSIONS AND RESULTS

The main sociodemographic characteristics of the study population on which the statistical inferences are made focus on gender, age and professional position.

From the point of view of the distribution of respondents according to gender, the results show that fewer males (n=67) than females (n=139) participated in the survey.

**Table 1:** Gender distribution of respondents

Country	Male	Female
Georgia	32.5%, n=26	67.5%, n=54
Republic of Moldova	33.1%, n=42	66.9%, n=85
Total	68	139

According to the data presented in Table 1, gender distribution in both countries was represented in approximately equal proportions, with very minor differences between the two. Regarding the distribution by age group, there was no balanced distribution. The distribution of respondents from the Republic of Moldova by age group shows that the largest share was that of respondents aged between 31-45 years, while in Georgia – those over 56 years old comprised the largest share (Table 2). The lowest participation rate in both countries was that of people aged between 26-30.

**Table 2.** Age distribution of respondents

Age	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
20-25 years	7	5.5	9	11.3
26-30 years	6	4.7	4	5
31-45 years	46	36.2	14	17.5
46-50 years	19	15	6	7.5
51-55 years	19	15	11	13.8
>56	30	23.6	36	45

The staff who filled in the survey occupy a variety of positions (Table 3). Most respondents in Georgia were Ph.D. students (23.8%) and librarians (22.5%). At the same time, other categories, such as librarians, including laboratory workers, scientific consultants, etc constituted another 22.5%. Of the respondents from the Republic of Moldova who participated in this survey, the largest share was represented by lecturers (37%), followed by librarians (26%). The remainder was made up of academic researchers (18.1%), Ph.D. students (13.4%) and students (4.7%).

**Table 3.** Distribution of respondents by professional position

Position	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Lecturr	47	37	7	8.88
PhD student	17	13.4	19	23.8
Researcher	23	18.1	6	7.5
Student	6	4.7	12	15
Librarian	33	26	18	22.5
Other	1	0.8	18	22.5

The results of the study demonstrate that most respondents in both countries were familiar with the AGRIS database.

According to the results of the study, the main sources of information about the AGRIS system for respondents from the Republic of Moldova were librarians (44.9%), the library website (39.4%) and trainings (35.4%). This is an expected result because the Republican Scientific Agricultural Library has Country Hub functions and the librarians are active promoters of the AGRIS database, using various promotion methods, such as managing the AGRIS & Moldova directory on the library website, organizing promotion campaigns, training activities, dissemination of various informative materials, etc.

The most relevant source of information for the respondents in Georgia was the trainings (36.3%) organized by Techinformi as a Country Hub, to raise the awareness of researchers from agricultural scientific institutions about the role and importance of AGRIS, as well as those focused on skill development to use the AGRIS database. In the last three years, Georgia and Republic Moldova Country Hubs have organized three to four trainings focused on AGRIS every year.

The respondents also indicated that they became aware of the AGRIS database by visiting the FAO website, which is the main way of disseminating and promoting the activity of Country Hubs.

Analyzing the frequency of AGRIS use revealed that, although AGRIS was not on the daily agenda of respondents from both Republic of Moldova and Georgia, it was used by the vast majority of respondents. 25.2% of Moldovan respondents indicated that they use AGRIS weekly, 32.3% - at least once a month, and 11.8% - quarterly (once every three months). The frequency of use of AGRIS by the respondents in Georgia is structured as follows: weekly – 12.5%, at least once a month – 18.8% and quarterly – 2.5%.

However, it should be noted that there were respondents who rarely used AGRIS (21.3% from Moldova and 27.5% from Georgia), and some respondents mentioned that they never used the database (5.5% from Moldova, 17.5% from Georgia). In this context, the Country Hubs in Georgia and Republic of Moldova should continue to promote the AGRIS database among the university community regarding the importance and role of AGRIS for teaching and research, as well as for their information needs.

**Table 4.** Information sources about AGRIS

Sources	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage

From a librarian	57	44.9	4	5
From a colleague	7	5.5	21	26.3
Library website	50	39.4	-	-
FAO website	22	17.3	14	25
Trainings	45	35.4	29	36.3
Promotional materials	13	10.2	6	7.5

According to the results presented in Table 5, it can be concluded that the respondents from both countries used all types of resources available in AGRIS.

**Table 5.** Types of resources available in AGRIS used by respondents

Types of resources	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Books	63	49.6	14	17.5
Conference papers	61	48	6	7.5
Journal papers	103	81.1	36	45
Book chapters	31	24.4	2	2.5
Technical reports	11	8.7	1	1.3
Datasets	26	20.5	18	22.5
Dissertations	26	20.5	3	3.7

The vast majority of respondents (81.1%, n=103) from the Republic of Moldova widely accessed journal papers. Respondents who accessed books (49.6%, n=63) and conference materials (48%, n=61) recorded almost equal shares. Likewise, respondents from Georgia primarily used journal papers (45%, n=36). Other resources accessed by them included theses and book chapters. The least used resources were technical reports, both in Georgia (1.3%) and in Moldova (8.7%).

The results of the study highlighted that datasets are also used both in Georgia 22.5% (n=18) and in Moldova 20.5% (n=26), a fact that is due to the new function of AGRIS to facilitate access not only to the bibliographic data of scientific publications but also to more than four thousand sets of agricultural data, which have been added to the AGRIS database in recent years. Generally, users were satisfied with the results obtained in the process of searching for information in AGRIS on a specific topic. On average, more than 10% of respondents in both countries said they always found the information they needed in AGRIS. Most respondents (70.1% from Moldova and 51.2% from Georgia) frequently found the information they were looking for in the database. However, 12 respondents from Georgia rarely identified information on the subject of interest, and two respondents from Moldova did not find the requested information.

**Table 6.** The level of information discovery in AGRIS

Level	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Always	21	16.5	8	10



Often	89	70.1	41	51.2
Sometimes	15	11.8	19	23.8
Rarely	-	-	12	15
Never	2	1.6	-	-

The survey revealed that members of the university community and researchers use the AGRIS database for various purposes. First, in the Republic of Moldova, the AGRIS database is used for writing scientific papers (48%), to get acquainted with previous researches in the field and to cite authors from other countries. The main purpose of using AGRIS by the respondents in Georgia also focused on the writing of scientific papers (37.5%).

**Table 7.** The purpose of using the AGRIS database

Activity	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Prepare university courses	30	23.6	3	3.8
Scientific project	40	31.5	5	6.3
Laboratory/field/experimental research	26	20.5	5	6.3
Elaboration of dissertations	33	26	17	21.3
Elaboration of scientific papers	61	48	30	37.5
Preparing presentations at conferences	33	26	20	25
Acquiring new knowledge in a scientific field	36	28.3	8	10
Familiarity with the work of a researcher in a field	24	18.9	2	2.5
Decision-making process	14	11	2	2.5

It was determined that 31.5% respondents from Moldova used AGRIS resources for research in a scientific project. As for the respondents from Georgia, AGRIS resources were used less for this purpose. Both respondents from Georgia and Moldova registered the same percentage values in the use of AGRIS (about 26%) for the preparation of communications and presentations at conferences and other scientific events.

Twenty-six percent (26%) of Moldovan respondents and 21.3% of those from Georgia use AGRIS to prepare their doctoral theses, a fact determined by the active involvement of doctoral students in the research process and their complex information needs.

Six possible advantages of the AGRIS database were listed in the survey, where the respondents selected the advantages they considered relevant. The recorded results highlight that the greatest advantages reported by the respondents from both countries were the free public access and the enormous volume of information that AGRIS makes available, connecting users to global agricultural information.

**Table 8.** Advantages of the AGRIS database

Advantages	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Large volume of information	96	75.6	36	45
Free access	110	86.6	56	70

Access to content in various languages	62	48.8	28	35
Quick information search	69	54.3	29	36.3
Advanced search capabilities	30	23.6	34	42.5
Multilingual interface	17	13.4	17	21.3

Analysis of the obtained data indicated that most of the respondents (77.9% from the Republic of Moldova and 78.8% from Georgia) confirmed that the AGRIS database could be rapidly searched and filtered. Thus, the database significantly reduces the time for information and data discovery needed by researchers, who are very busy with research activities, experiments in the laboratory and in the field, etc.

In recent years, AGRIS has constantly updating and improving its services, launching new search functionalities, offering users more flexible and efficient communication with the system, and vast possibilities to easily access various resources and identify specific information.

Among the advantages highlighted by the respondents, the multilingual interface and the possibility of accessing content in different languages are no less important. For 48.8% of Moldovan respondents and 35% of Georgian respondents, it is very important along with those up to 90 languages included in AGRIS, the multilingual search functionality allows searches in the native ones, Romanian and Georgian languages.

The AGROVOC multilingual thesaurus, which is integrated into the AGRIS database, helps to identify relevant keywords in these languages. It should be noted that Techinformi from Georgia is the official AGROVOC editor of the Georgian version, while the Republican Scientific Agricultural Library from the Republic of Moldova is the official AGROVOC editor of the Romanian version.

In addition to the advantages mentioned by the respondents, the findings of the study also indicate a positive impact of the AGRIS database on the research process in the Republic of Moldova and Georgia. The majority of respondents assigned the qualifications “important” and “very important” to all the presented options. The respondents confirmed the well-known fact that the AGRIS system expands access to the results of scientific research and helps to promote Moldovan and Georgian scientific research worldwide.

Respondents also recognized the real impact and benefits of the AGRIS system, agreeing that it contributes to increased citation possibilities, improved knowledge transfer for all those interested in food and agricultural science and technology, and transparency of the scientific process.

**Table 9.** Constraints and barriers in the use of the AGRIS database

Barriers	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Lack of information retrieval skills	22	17.3	6	7.5
Getting irrelevant information in the search result	11	8.7	4	5
Lack of access to the full text of the documents	55	43.3	24	30
Lack of information on particular subject areas	17	13.4	5	6.3
The language barrier	40	31.5	15	18.8

Technical issues	34	26.8	26	32.5
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Table 9 shows the results of the constraints and problems that prevent the effective use of the AGRIS database by the surveyed respondents. The results revealed that the biggest problem reported both by the respondents from Georgia (30%, n=24) and from Moldova (43.3%, n=55) was the lack of access to full texts of documents. AGRIS, being a bibliographic database, does not archive the full texts of the documents, but only provides links to the sites of the repositories, the institutions where the documents were stored. Bibliographic records integrated into AGRIS until 2010 often do not have links to documents.

Users increasingly expect to simply search subject categories in a generic search engine and click on the results to open full-text journal articles, conference proceedings and book excerpts, and any other resources that will enable them to answer their queries<sup>9</sup>.

If the link to the full text is missing, users can request the full text from the publisher or the AGRIS data provider or through an international interlibrary loan. This fact was confirmed by the respondents' answers to the question "How did you get access to the unavailable documents?", with the respondents mentioning, in particular, the international interlibrary loan. This service was used more actively by respondents from the Republic of Moldova (33.1%, n=42) because the Republican Agricultural Scientific Library acts as a national point for International Interlibrary Loans in agricultural and adjacent sciences. Twenty 23.7% (n=19) respondents from Georgia request document texts from AGRIS data providers more often. A small number of respondents requested the text of the document from the publisher (Moldova - 4.7%, n=6, Georgia - 3.7%, n=3).

The survey revealed that 18.8% of respondents from Georgia and 31.5% from Moldova encountered problems related to the language barrier, although AGRIS has incorporated the "Translate with Google" tool, which facilitates the translation of bibliographic information and document summaries in the language selected by users. Technical problems represented another constraint faced by the respondents (Georgia - 32.5%, Republic of Moldova - 26.8%). Other problems identified by respondents are related to the information search process, such as lack of advanced information retrieval skills, lack of information on particular subject areas or obtaining irrelevant information in the search result. It would be relevant for users to use the multilingual AGROVOC thesaurus as a tool for retrieving information, and communicating in the same language with the indexers. AGROVOC is the controlled vocabulary used for indexing all records in the AGRIS database.

An attempt was made to find out how respondents coped when they encountered difficulties in using the database and who they addressed for help. Some respondents (20.5% from the Republic of Moldova and 16.2% from Georgia) manage to use the database by themselves. A share of respondents (37.8% from the Republic of Moldova and 45% from Georgia) sometimes requested assistance, while others only did so in difficult cases.

**Table 10.** Frequency of requests for help in using AGRIS

Frequency	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Ever	7	5.5	9	11.3
Often	20	15.7	4	5

<sup>9</sup> Anibaldi, Stefano, Jaques, Yves, Celli, Fabrizio, Stellato, Armando, Keizer, Johannes. Migrating Bibliographic Datasets to the Semantic Web: the AGRIS case. 9 p. Available: <http://eprints.rclis.org/21112/7/swj463.pdf>

Sometimes	48	37.8	36	45
In difficult cases	26	20.5	18	22.5
I can do it alone	26	20.5	13	16.2

Table 11 shows that 76 respondents from Moldova (representing 59.8% of respondents) and 20 respondents from Georgia (representing 25% of respondents) requested the assistance of the library staff in using the AGRIS database. 43.3% of respondents from Moldova and 30% from Georgia found help in user guides, which are accessible in English, Romanian, and Georgian languages.

**Table 11.** Assistance in using AGRIS

Source	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Librarian	76	59.8	20	25
User guides	55	43.3	24	30
Tutorials	27	21.3	5	6.3
Trainings	30	23.6	31	38.7

The study also showed that 38.7% of Georgian respondents and 23.6% of Moldovan respondents, respectively, opt for the trainings organized by AGRIS Country Hubs. To develop the skills of using the AGRIS database and to be aware of the new developments and functionalities of AGRIS, an almost identical number of respondents from both countries (Georgia - 72.5%, n=58, Moldova - 72.4%, n= 92) expressed a desire to be provided with the training.

**Table 12.** Training needs

Topics	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
General characteristics of AGRIS	29	29.9	23	28.7
Resources indexed in AGRIS	33	34	23	28.7
Open Datasets	57	58.8	28	35
Search strategies in AGRIS	43	44.3	28	35
Search based on AGROVOC terms	38	39.2	21	26.3
Saving search results	39	40.2	12	15

The top training preferences of researchers from the Republic of Moldova included training on open data sets, for which 58.8% of respondents opted. Researchers in Georgia similarly indicated an interest in training on open datasets (35%) and search strategies in AGRIS (35%). Other preferred training topics of Moldovan researchers were search strategies in AGRIS (44.3%), saving search results (40.2%), and searching based on AGROVOC terms (39.2%). Georgian respondents were equally interested in training on the general characteristics of AGRIS (28.7%) and on resources indexed in AGRIS (28.7%).

**Table 13.** The degree of satisfaction regarding the use of AGRIS

The degree of satisfaction	Republic of Moldova		Georgia	
	Frequency	Percentage	Frequency	Percentage
Very satisfied	26	20.5	11	13.8
Satisfied	99	78	43	53.8
Partly satisfied	2	1.6	24	30
Dissatisfied	-	-	2	2.5

The general perception regarding the contribution of AGRIS resources to meeting the informational needs of users was positive combining the number of respondents who declared themselves “very satisfied” and “satisfied” established a high degree of satisfaction for both researched samples (Republic of Moldova - 98.5%, n=125, Georgia - 67.6, n=54). Of all the respondents, 24 were from Georgia and two from the Republic of Moldova mentioned that they were partially satisfied. A positive finding that there were no respondents who were dissatisfied with the services offered by AGRIS, except for two respondents from Georgia.

Generally, AGRIS to satisfied its users. The evaluation of the user satisfaction degree highlighted that over the years AGRIS has succeeded in gaining the trust of users interested in agricultural science and technology.

The question regarding the use of other databases generated by FAO was included in the survey with the intention of knowing which other FAO databases are useful in the educational and research process for researchers from Georgia and the Republic of Moldova. Apart from AGRIS, AGORA proved to be the most used database, mentioned by 80.3% (n=102) of the respondents from Moldova and 50% (n=40) from Georgia. This is only to be expected since both countries have been granted access to the database for several years.

The FAOSTAT statistical database was ranked second in respondents' preferences, with 43.3% (n=55) of respondents from Moldova and 27.5% (n=22) from Georgia. Survey results from both countries indicates that researchers frequently refer to the statistical content of FAOSTAT to find out various statistics, for example, on global agricultural production and on various countries, consumption of pesticides and fertilizers, livestock, agricultural price indices, the export and import of agri-food products, etc.

The respondents also mentioned other FAO databases, portals, and information systems that they use, such as FAOLEX, AQUASTAT, Aquatic Sciences and Fisheries Abstracts (ASFA), FAO SOILS PORTAL, Food Loss and Waste Database, The Right to Food around the Globe, AOVAMAPS and GAEZ - Global Agro-Ecological Zones.

Being a practical tool for obtaining user feedback, the survey also included a section where comments or suggestions regarding the role and importance of the AGRIS database for research could be provided by respondents. The comments provided by respondents underlined that:

*“AGRIS plays an important role in promoting agricultural innovation for the sustainable development of agriculture, and in this regard the expansion and continuous enrichment of the database is essential”.*

*“AGRIS contributes to increasing the responsibility of authors and improves the exchange of scientific results at the international level”.*

*“Searching and studying scientific publications represent an essential part of researchers' activity. In AGRIS I can find a lot of new information, useful information for my research, experiments, but also which can be useful for discovering new research directions”.*

*“An essential point is the fact that there is such a database that can be accessed for free and leadsto a large volume of full-text publications, especially new, current publications. It is an effective informational support tool, which significantly simplifies my research work”.*

*“As a teacher at the agricultural faculties, I use AGRIS very often and I recommend it to bachelor’sand master’s students because it is a free database, modern and comfortable to use and containsa lot of useful information for agricultural specialists”.*

## **CONCLUSIONS**

The study showed that AGRIS is well known by the majority of respondents from both the Republic of Moldova and Georgia. Respondents registered high levels of awareness due to the round tables, trainings, AGRIS information, and awareness campaigns provided and supported bythe two Country Hubs.

Generally, the opinions of the respondents from Georgia correspond to those of the respondents from the Republic of Moldova, with minor differences.

The availability, variety, and abundance of resources to which AGRIS provides access represent the defining aspects with significant influence on user satisfaction. The most frequently used resources are scientific papers, which were indicated both by respondents from Moldova (81.1%)and Georgia (45%). Also, in recent years there is a trend towards the use of datasets, resources thatare becoming increasingly in the research system.

Most of the respondents who used AGRIS evaluate this resource as effective and having a positiveimpact on the research processes in the Republic of Moldova and Georgia, being of real help to researchers in writing scientific publications, preparing university courses and presentations at conferences, acquiring new knowledge in a scientific field, etc.

However, some constraints and barriers in the use of AGRIS database were reported. A significantproportion of the respondents mentioned the lack of access to the full text of the documents, a barrier that can be removed through the international interlibrary ioan in agricultural and adjacentsciences. Other mentioned problems related to the language barrier, technical aspects, as well as the lack of in-depth skills in information discovery.

## **RECOMMENDATIONS**

Based on the results of this study, it is recommended that AGRIS Country Hubs focus on the following activities:

*Promotional strategies.* Country Hubs from Georgia and Moldova should continue to develop promotional strategies that increase in-depth knowledge of AGRIS and use persuasive ways to induce and motivate users to use it in the research process. Librarians can demonstrate the benefitsand value of the AGRIS initiative of open and free access to information and data in agriculture and the food industry sector.

*Training of trainers.* To fully exploit AGRIS services, it is necessary to increase the number of trainers who are properly trained in using the AGRIS database, so that they can develop skills andprovide assistance when users encounter difficulties in using the database. The training of professional trainers would contribute to the improvement of the quality of the training process and the development of the knowledge, skills, and competencies of users in the use of AGRIS.

*Faculty librarians.* Faculty librarians can be promoters of the AGRIS database within the facultiesthey serve. Creative adaptation of information science skills provides faculty librarians with a foundation for communicating effectively with students and researchers and meeting their increasingly dynamic and complex information needs. The focus on personalized user assistance will contribute to the development of in-depth skills in the use of AGRIS. Having consolidated connections with the faculty and being facilitators of information resources and

information tools, librarians can thus increase the degree of awareness of AGRIS services and functionalities within the university community.

*Information literacy.* AGRIS topics could be included as a separate module in information literacy courses and delivered regularly. If information literacy is not included as a distinct discipline in the curriculum, libraries should identify as many associative relationships as possible in existing or developing university programs and initiatives and engage in collaborative training projects with various departments in the institution.

This study provides an insight into the commitment to improve the work of AGRIS Country Hubs, with an emphasis on the development of strategies to promote and raise awareness of the agricultural community in the Republic of Moldova and Georgia regarding the AGRIS system, and the diversification and better adjustment of training programs and educational resources to local contexts.

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