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Trends Among researchers Towards the Use of Open Research Data Available Through the Repositories indexed in Re3data: A Survey study at the Environmental Research Center

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Abstract:

This study aims to explore researchers' trends regarding the use of open research data in the fields of natural and life sciences, specifically data available through repositories indexed in Re3data. We employed a descriptive method with a quantitative approach to investigate the attitudes of 35 permanent researchers affiliated with the Algerian Center for Research in the Environment.

Data was collected using an electronic questionnaire. The findings revealed that while the respondents possess strong skills in utilizing open research data, their proficiency with the repositories indexed in Re3data is only moderate.

This limitation is not due to a lack of capability but rather stems from their limited experience with the data available through these repositories. Additionally, the study found no significant differences in researchers' trends based on the variable of their specialized research department, except for variations related to the types of content used.

Keywords:

open research data, open research data repositories, Re3data registry, Data on Natural and Life Sciences Research, Algerian Center for Environmental Research.

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1- INTRODUCTION

Open research data has become one of the most important modern concepts in the field of scientific research globally, due to its increasing value in accelerating the pace of scientific inquiry. This is especially true as it is one of the fundamental pillars of the open science philosophy that academic organizations strive to embody in the best ways and on the broadest scale, in order to enhance the reliability and transparency of scientific research outputs and ensure their visibility.

According to UNESCO's recommendation on open science issued in 2021, open research data includes all processed analog or digital data with descriptive metadata, as well as raw primary data, text, audio, or audiovisual records, and images. It also encompasses protocols, source codes, and workflows, in addition to the results of survey research collected through interviews, observations, or laboratory experiments using measurement with automated equipment. Anyone can retain, use, or reuse this data as long as it is subject to intellectual property controls and the rights arising from its creation (UNESCO, 2021, p. 7).

Open research data is provided in the easiest ways through automation and human readability, in accordance with the guidelines and recommendations of FAIR principles, which aim to establish a legal and technological mechanism to ensure the discoverability and accessibility of datasets by researchers effectively and efficiently as a new part of open science policy (Azeroual & Others, 2022, p. 1), as well as interoperability between digital spaces, thanks to highly complex systems that are often open research data repositories. Open research data repositories are digital facilities capable of managing and accommodating the vast amount of research data across all disciplines, providing functions for depositing, collecting, organizing, and processing datasets in standardized ways for archiving and long-term preservation (Mohamed, Abdelbasset, & Taha, 2021, p. 20), ensuring accessibility for the academic community and promoting greater dynamism in the scientific communication process.

The Re3data—Registry of research data repositories—indexes, as of May 2025, 3370 repositories across all disciplines and in various forms, whether open or restricted. Among these, there are 1708 open repositories in the life sciences and 1564 open repositories in the natural sciences, which are the most supported and covered disciplines by the registry. The number of repositories that provide open research data in both fields simultaneously reaches 800 (Re3data, 2025). These repositories are accompanied by their descriptive data, making the registry an effective tool for accessing open research data in the fields of natural and life sciences. Additionally, it assists researchers in selecting the repository that best suits their needs for depositing and preserving their data to enhance its global visibility. The Re3data registry is one of the research tools

recommended by the European Commission for researchers to use in support of scientific productivity under the Horizon 2020 project (Re3data, About re3data, 2025).

We find that the field of environment in Algeria has received significant attention from the state, as the subject of environmental security is one of the major challenges that the Algerian government has taken into consideration among its priorities, forming, along with energy and food security, the strategic axes for the socio-economic development of Algerian society. This is reflected in the establishment of various mechanisms in the academic sector, foremost among them the founding of the Algerian Center for Environmental Research, which serves as a scientific and technological hub to support research in the field of environment, affiliated with the Directorate of Scientific Research and Technological Development at the Ministry of Higher Education and Scientific Research. It also serves as a collaborative and interactive space for researchers to contribute scientific results based on research data obtained through various methods.

This research paper aims to explore the attitudes of researchers at the Algerian Center for Research in the Environment towards the use of specialized open research data in the field of natural and life sciences available through repositories indexed in the Re3data registry. Environmental diversity, the study of living organisms, and the physio-ecological system are fundamental topics in the field of the environment that fall under the domain of natural and life sciences.

This study emerges as one of the significant topics within the context of social communication in academic environments. Open research data is not merely scientific content managed in digital repositories, but rather purposeful content that enhances opportunities for scientific empowerment and research production. This content is shared and disseminated to achieve scientific accumulation and collaboration, while increasing visibility opportunities to attain the highest levels of utilization and satisfy research needs in accordance with the Uses and Gratifications Theory in media and communication studies. Consequently, this study constitutes a shared knowledge domain between the fields of Library and Information Science and Media and Communication Studies.

We have studied these trends in accordance with the procedural objectives of the study, which are:

- A panorama presentation of the Re3data repositories that provide open research data in the field of natural and life sciences.
- Measuring the skill level of researchers at the Algerian Research Center for the Environment, related to the use of open research data repositories indexed in the Re3data registry.
- Uncovering the motivations of researchers at the Algerian Center for Research in the Environment for using open research data in the field of natural and life sciences.

- Identifying the nature of open research data that researchers at the Algerian Center for Research in the Environment prefer to use, both in terms of content and format.
- Monitoring the difficulties associated with the use of specialized open research data in the field of natural and life sciences by researchers at the Algerian Center for Environmental Research.
- Revealing the differences in the attitudes of researchers at the Algerian Center for Research in the Environment towards the use of open research data available through the indexed repositories in the Re3data registry.

2- literature review:

In this section of the research paper, we will present the most important studies related to the topic of using open research data in chronological order from the most recent to the oldest, which have contributed to the empirical application of the study, as follows:

In 2021, Khulood Alabri and others conducted a quantitative study aimed at identifying the motivations and areas of use for open government data in scientific research at the College of Arts and Social Sciences at Sultan Qaboos University in Oman.

The study relied on a quantitative approach that included 172 researchers and academics from various literary and social disciplines by distributing a questionnaire to collect and interpret research data and achieve the study's objectives.

The authors found that the main motivation for using open government research data is to support decision-making in research issues, in addition to accelerating the pace of scientific research. The researchers also concluded that there are secondary motivations, such as enhancing achieved results and establishing preliminary indicators for conducting scientific research (Alabri & Others, 2021).

Gulda Dogan and others conducted a survey in 2021 titled “Research Data Management” in Turkey aimed at studying researchers' awareness levels regarding the management and use of research data and understanding the associated practices. This study served as a first step towards laying the groundwork for building an effective national repository for research data. The authors sent an electronic questionnaire to 37,223 researchers, with 1,577 researchers responding to the questionnaire according to a quantitative statistical methodological approach.

The study found that researchers in Turkey have a low level of awareness regarding the use of research data and the development of management plans for it. Meanwhile, the authors discovered that 61.5% of Turkish researchers store their research data on their personal computers, and the

most commonly used types of content are charts, laboratory book data, and raw data (Dogan & Others, 2021).

In order to understand and identify the practices of research data management, usage, and sharing in Arab countries, specifically Egypt, Jordan, and Saudi Arabia, both Amany N. Elsayed and Imed conducted a study. I-Saleh conducted an exploratory study in 2017.

The study was conducted through an online survey that included 337 researchers, adopting a quantitative statistical approach and a descriptive method to analyze and interpret the collected results.

The study showed that 97% of researchers use and are responsible for research data, with the most commonly used forms of research data being textual data at 85%, statistical spreadsheets at 60.5%, and charts and images at 56.4%, without the majority specifying a particular standard for metadata. The study also revealed that 64.4% share their data, and the main motivations for using and sharing research data are contributing to research projects and enhancing researchers' visibility through increased citation rates, despite concerns regarding data confidentiality and security (El-sayed & Others, 2018).

It is observed from our presentation of these studies that they share a common aspect regarding the motivations that drive researchers to utilize research data, which aligns with the current study.

The knowledge gap of the current study focuses on examining the extent to which researchers possess the skills to utilize research data available in the open domain through repositories indexed in the Re3data registry, while highlighting the main difficulties they face in this regard.

3 – The methodological framework of the study:

Reaching scientific results requires reliance on a methodical approach that defines the research procedures, appropriate tools, and a sample capable of providing a clear perspective on the trends of researchers at the Algerian Center for Environmental Research regarding the use of open research data. In this section, we will address these fundamental methodological elements in any structured research according to the IMRAD style in writing scientific articles, which is an internationally recognized method.

3.1. Study Method

According to the nature of the study and its objectives, we relied on a descriptive survey methodology to measure the attitudes of researchers at the Algerian Center for Research in the Environment towards the use of open research data available through the Re3data registry repositories.

In order to analyze the study data using a quantitative statistical approach, descriptive statistical methods such as percentages, mean, and standard deviation will be employed, which are suitable for these studies, utilizing the SPSS software package, version 2022.

3.2. Study Population

I tried to study all the permanent researchers affiliated with the Algerian Center for Research in the Environment according to the following distribution:

Table 01: The Actual Study Community

Research divisions	Researcher's number	Participating researchers	Percentage
Environement and biodivetsity	11	09	81.8 %
Environement and health	09	08	88.9 %
Environement, climate change	11	10	90.9 %
Innovation, environement and waste management	09	08	88.9 %
Sum	40	35	87.5 %

Source: Prepared by the authors

It can be observed from Table 01 that the number of permanent researchers at the center is 40 researchers, while the actual study population is estimated at 35 researchers, which is a percentage of 87.5% of the original population. Meanwhile, 5 researchers refrained from responding to the data collection tool, accounting for 12.5%.

3-3- Study Tool:

The questionnaire is the primary tool in research of a statistical nature, as we designed an electronic questionnaire using "Google Forms" to facilitate the process of statistical analysis and communication with participating researchers.

The questionnaire consists of two sections:

Section One: This section identifies the research field to which the researchers belong.

As for the second section, it contains four axes that align with the study's objectives: the first, second, third, and fifth axes include statements to measure researchers' attitudes towards the use of open research data and its repositories, the motivations for use, and the associated difficulties, relying on the triple "Likert" scale that defines categories and levels of measurement through the

analysis of the mean and standard deviation. As for the fourth axis, it determines the nature of the research data used based on percentages.

The triple "Likert" scale relies on determining the degree of agreement based on the category to which the respondents' answers belong, as shown in the table.

Level of agreement	The length of the category.	The category	The response
Low	1.66 - 1	1	Not in agreement.
Medium	2.33 - 1.67	2	Neutral
High	3 - 2.34	3	Agreed

Source: Prepared by the authors

4 - An overview of the Algerian Center for Environmental Research:

The Research Center for the Environment (CRE) is a scientific and technological institution located in Annaba, Algeria. It was established by Executive Decree No. 18/264 dated 17/10/2018 and began its administrative activities on 17/01/2019 after the installation of its board of directors. Its scientific and research activities officially commenced in 2021 following the recruitment of researchers for the first time, making it one of the newest research centers in Algeria.

The center is completing numerous research projects related to the ecosystem, aimed at addressing issues such as: the conservation of natural resources, climate change and its impact on the ecosystem, tackling risks arising from environmental pollution, promoting the green economy and waste management, in addition to supporting research aimed at the biodiversity of living organisms (CRE, 2025).

5- Result and discussion:

5-1- A panorama of open research data repositories in the field of natural and life sciences indexed in the Re3data registry:

Re3data is the abbreviation for “Registry of Research Data Repositories”, which is a global registry that includes research data repositories across various academic disciplines. It encompasses repositories that provide long-term preservation of research data sets and accessibility for researchers, academic institutions, funders, and publishers, thereby increasing the visibility and sharing opportunities in the field of research data creation by the scientific community.

Re3data started working in 2012 as an initiative of the German Research Foundation (DFG) and several supporters and funders of the project, most notably:

- Berlin School of Library and Information Science.

- Helmholtz Office for Open Science at the GFZ German Research Centre for Geosciences.

- Karlsruhe Institute of Technology KIT.

- Purdue University Library.

The partner contributors to the Re3data project aim to expand the German information network both locally and globally, and to develop activities for managing research data sets.

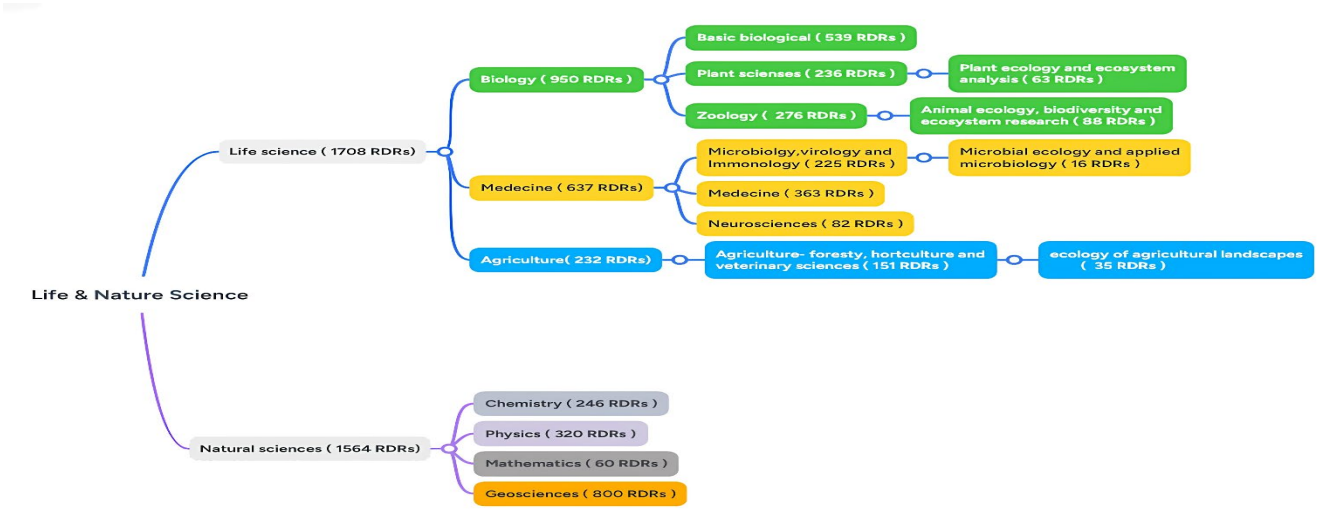
Among the most important fields and scientific topics for open research data, we find the domains of natural sciences and life sciences, which are supported by the largest number of indexed repositories in the registry. Therefore, we thought it appropriate to provide a descriptive overview of the landscape of these repositories through the following dimensions:

5-1-1 The thematic classification of open research data repositories in the fields of natural and life sciences:

Re3data classifies open research data repositories into 04 major groups based on their subject specialization:

Life Sciences: 1708 RDR, Natural Sciences: 1564 RDR, Humanities and Social Sciences: 1150 RDR, Engineering Sciences: 715 RDR. Each of these repositories is hierarchically divided into more specialized subject groups. Below is a presentation of the main subject divisions for the fields of Natural and Life Sciences, highlighting the branches related to the topics of environment and ecosystem, as they are the focus of our current study.

Figure 01: Distribution of open research data repositories in the field of natural and life sciences according to subject classification.



Source: Prepared by the authors based on the Re3data registry.

It can be observed from Figure 01 that the field of Natural and Life Sciences branches into two main sections:

Life sciences, which in turn is divided into three major main topics:

• Biology: With 950 as a repository, this subject is divided into three subtopics, which are:

- Basic biology: 539 repositories, Plant sciences: 236 repositories, of which 63 repositories cover research related to: Plant ecology and ecosystem analysis, Zoology: 276 repositories, of which 88 repositories include research data related to:

. Animal ecology, biodiversity, and ecosystem.

• Medicine: It indexes 637 repositories of open research data in the field of medicine, which is divided into three subtopics:

Microbiology, Virology, and Immunology have 225 repositories, including 16 repositories that provide research data related to: Microbiological ecology and applied microbiology. Human Medicine has 363 repositories, Neurosciences has 82 repositories.

Agriculture: 232 repositories, including 151 repositories that provide research data in the fields of Horticulture, Forestry, and Veterinary Sciences. This topic branches into a subtopic represented by Agricultural Landscapes Ecology, which is covered by 35 repositories.

As for the field of natural sciences, it is divided into four main major topics, which are:

- Chemistry: with 246 repositories.
- Physics: with 320 repositories.
- Mathematics: with 60 repositories.
- Geosciences: with 800 repositories.

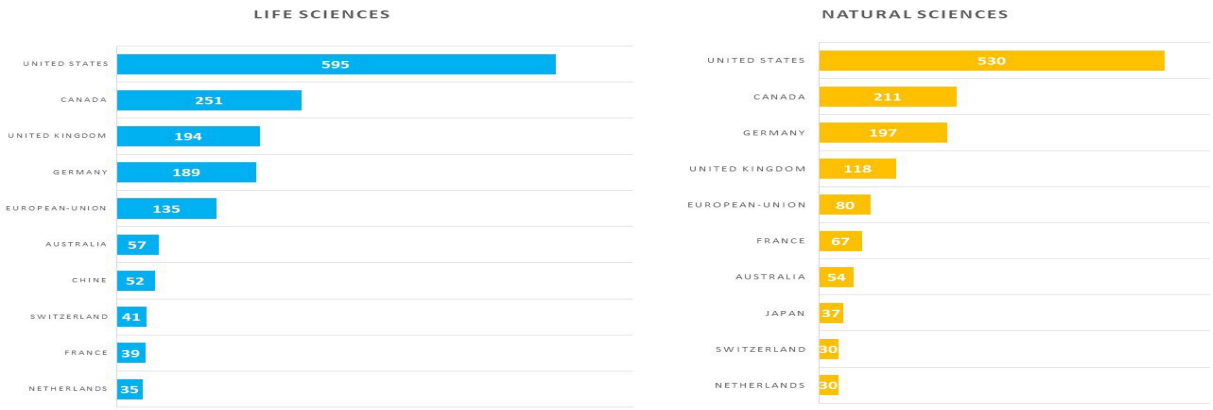
These are interconnected topics that support aspects related to natural studies and ecological systems.

It appears that the repositories providing research data related to the environment are primarily concentrated in the subject area of life sciences, specifically in plant sciences, animal sciences, medicine, and microbiology. The remaining topics form integrated links to support studies in life sciences in general and the environment in particular, which makes Re3data an essential tool that enables researchers affiliated with the Algerian Center for Environmental Research to access open research data repositories that offer studies aligned with their research needs, as well as explore opportunities to publish their research and increase their visibility both locally and globally.

5-1-2- Distribution of open research data repositories by country:

The number of countries that have a research data repository indexed in Re3data is 89, of which 84 countries have repositories that provide open research data in the fields of natural and life sciences. Below is a presentation of the top 10 countries that have the largest number of open research data repositories in the mentioned field.

Figure 02: Distribution of open research data repositories in the field of natural and life sciences across the top 10 countries.



Source: Prepared by the authors based on the Re3data registry.

It can be observed from Figure 02 that the United States of America excels in the number of data repositories for natural and life sciences, with 595 repositories in life sciences and 530 in natural sciences. Canada follows with 251 repositories in life sciences and 211 in natural sciences. In third place, the United Kingdom has 194 repositories in life sciences, while Germany has 197 in natural sciences. The two countries exchange positions in fourth place, with Germany having 198 repositories in life sciences and the United Kingdom having 118 in natural sciences.

In fifth place, the European Union ranks in both fields with 135 repositories in life sciences and 80 repositories in natural sciences. The remaining five positions in life sciences are occupied by Australia, China, Switzerland, France, and the Netherlands, with numbers closely ranging between 57 and 35 repositories.

In the field of natural sciences, France, Australia, Japan, Switzerland, and the Netherlands also have similar numbers, ranging between 67 and 30 repositories.

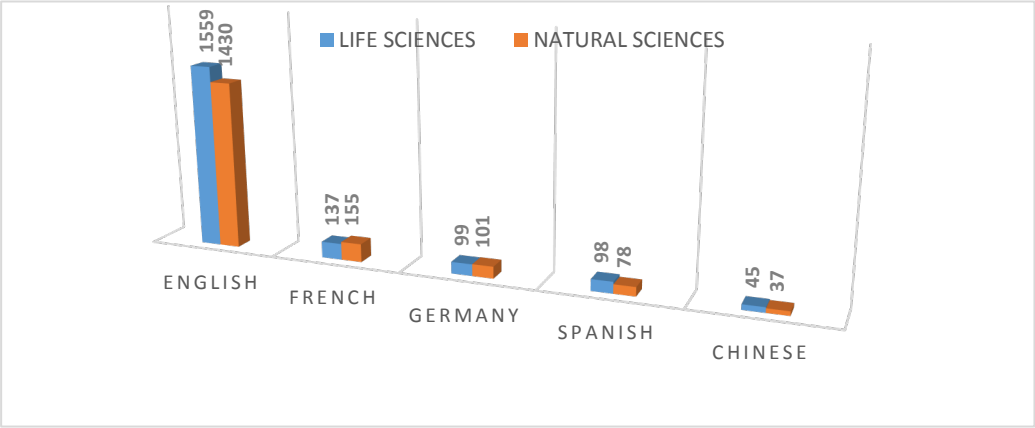
The result can be explained by the widespread practices associated with open research data in both fields and their importance in enhancing the dynamics of academic communication in North America and Europe, considering these five geographical regions as pioneers in promoting the culture of open research data and encouraging its sharing and use, in line with the Open Science recommendations initiated by UNESCO. Additionally, the extensive presence of research centers

and institutions, especially in the United States, contributes to its leading position in the global ranking.

5-1-3 - Distribution of open research data repositories in the field of natural and life sciences by language:

Re3data relies on the language index to filter research data repositories. In this regard, we present the five most supported languages by the registry repositories in the fields of natural and life sciences.

Figure 03: Distribution of open research data repositories in the field of natural and life sciences by language.



Source: Prepared by the authors based on the Re3data registry.

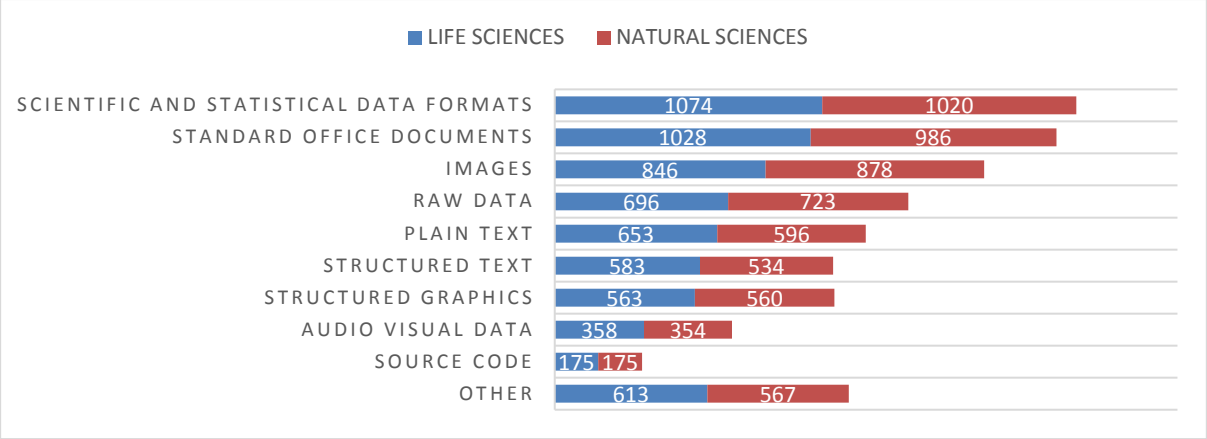
It is evident from Figure 03 that English language is the most widely used language for publishing open research data, with 1,559 repositories in life sciences and 1,430 repositories in natural sciences, accounting for 96.47% and 97.14% respectively of the total open research data repositories available in these fields. This is followed by French, with 137 repositories in life sciences and 155 repositories in natural sciences, while German ranks third with 99 repositories in life sciences and 101 repositories in natural sciences. Spanish comes next with 98 repositories in life sciences and 78 repositories in natural sciences, and finally, Chinese holds the fifth position with 45 repositories in life sciences and 37 repositories in natural sciences. Thus, the top five languages are similar in both fields.

This result can be attributed to the widespread use of the English language in publishing research and research data globally, as it is the most commonly used language in scientific research and its outputs within the academic community.

5-1-4 Distribution of open data repositories in the field of natural and life sciences according to the content format:

The forms of open research data provided by the repositories listed in Re3data are diverse. Below is a classification of the nature of open research data specialized in the fields of natural and life sciences according to their form:

Figure 04: Distribution of open research data repositories in the field of natural and life sciences by content type



Source: Prepared by the authors based on the Re3data registry

Figure 04 shows that the largest number of repositories provide their research data in the form of scientific and statistical data: 1074 repositories in life sciences and 1020 repositories in natural sciences, equivalent to 66.46% and 69.29% of the total number of repositories that provide specialized data in the two mentioned fields, while the number of repositories that provide data in the form of standard office documents is 1028 repositories in life sciences and 986 repositories in natural sciences, equivalent to 63. The number of repositories that make their open data available in both disciplines in the form of Images is estimated at 846 repositories in the life sciences and 878 repositories in the natural sciences, equal to 52.3% and 59.6%, while the number of repositories that make open research data available in the form of: Raw data, Plain text, Structured text and Structured graphics come in similar numbers and proportions between 696 and 563 repositories in the life sciences, with percentages ranging between 43.06% and 34.8%, while for the natural sciences they also range between 723 and 560 repositories, with percentages of 49.11% and 38.04%, while repositories that provide data in Audio visual form are estimated at 58 repositories in the life sciences and 354 repositories in the natural sciences, with percentages of 22. 15 % and 24.04 %, while the number of repositories in both fields that provide open data in the form of source code is equal to 175 repositories for each field, which is 10.82% for life sciences and 11.88% for natural sciences, which is the lowest percentage of the total number of repositories that provide open research data in life and natural sciences. It should also be noted that there are 613 repositories in

the life sciences and 657 repositories in the natural sciences that provide open research data in multiple other formats that cannot be counted due to the multiple file extensions.

The availability of research data in the form of "scientific and statistical data" and "standard office documents" and "images" can be justified due to the ease of reading and analyzing them by researchers and also the ease of exchanging them in the digital environment through the use of interoperability protocols and technologies between digital systems and repositories, especially since the latter invest in the OAI- PMH, which provides the possibility of harvesting metadata between open archives and API technology to exchange research data between digital systems, and it can be said that the fields of natural and life sciences need to be enriched with research data in the form of source code as it contributes to building and designing systems and software specialized in analyzing, studying and predicting natural and living phenomena in general and providing intelligent systems to analyze and interpret the components and relationships that link ecosystems.

5.2 - Studying the trends among researchers at the Algerian Center for Research in the Environment towards the use of open research data specialized in the field of natural and life sciences available through indexed repositories in Re3data.

In order to study researchers' attitudes, we relied on five main dimensions according to which the survey was conducted, as follows:

5-2-1- Researchers' skills in using open research data :

Researchers' skills in using open research data were measured through 12 statements as shown in the following table:

Table 03: Researchers' open research data utilization skills

N^0	Expressions	mean	Standard deviation
1	I think that open research data includes all forms of data generated within the framework of the scientific research process	2,69	,583
2	I think that open research data is available within the scope of open access.	2,57	,739
3	I think that open research data is subject to legal frameworks that protect its intellectual property.	2,57	,739
4	4. I can search for open research data	2,69	,676
5	I can use digital tools that help me access open research data presented in various formats	2,74	,611
6	I can analyze and interpret open research data presented in various	2,80	,531

	formats		
7	I can use open research data available in different languages .	2,80	,531
8	I can use open research data available in different file extensions	2,69	,631
9	I can select platforms that help me publish open research data	2,17	,954
10	I describe open research data based on metadata standards such as Dublin Core and Data Documentation Initiative ...	2,09	,373
11	I rely on Creative Commons licenses to protect intellectual property when publishing open research data	1,94	,765
12	I rely on Copyright license to protect intellectual property when publishing open research data	2,71	,572
General mean and general standard deviation		2,69	,583

Source: Prepared by the authors using the SPSS package

Table 03 indicates that the general arithmetic mean value (2.69) and the general standard deviation value (0.583), which indicates that the respondents possess skills that enable them to deal with open research data and use them in scientific research in a high degree despite the existence of dispersion and disparity in these skills, due to the nature of the experimental and laboratory research that they carry out since the beginning of their academic studies, these types of studies greatly need research data, and also their needs to deal with these data in an open manner without restrictions.

It is noted that the arithmetic mean values range between (2.80 and 1.94), where the highest values were for statements 6 and 7, which reflects their high skills in dealing with research data available in multiple languages and different extensions according to statement 8, as for the lowest arithmetic mean is due to statement 11, which indicates their medium skills in protecting research data by relying on Creative Commons licenses, but they use the Copyrights license more according to the arithmetic mean value for statement 12, estimated at (2.71). 71), it should also be noted that researchers are moderately skilled in choosing digital platforms that help them publish research data for their scientific work and also describe these research data based on the metadata standards supported by Re3data such as the Dublincore standard, the Data Documentation Initiative standard and other metadata standard patterns according to the arithmetic mean value of statements 09 and 10 estimated at (2. 17 and 2. 09). This indicates that researchers have the ability to access open research data and are aware of its concept according to statements 01, 05 and 03, but they find difficulties in the process of publishing it, whether it is related to the normative description or protecting it from intellectual property violations within the open access environment or the digital spaces or platforms that help to make it available and retrieve it

5-2-2- Researchers' skills in using research data repositories indexed in Re3data registry:

The extent to which researchers have the skills to use open research data repositories was measured through 13 statements as shown in the following table:

Table 04: Researchers' utilization skills for research data repositories indexed in the Re3data registry

N^0	Expressions	mean	Standard deviation
1	I think that open research data repositories are a reliable source that ensures effective management, preservation, and accessibility of research datasets	2,54	,657
2	I have prior experience in using open research data repositories	1,94	,938
3	I can use the search engine of open research data repositories	2,17	,664
4	I can browse open research data repositories	2,63	,690
5	I can download files from open research data repositories	2,43	,739
6	I use research data repositories for publishing open research data	1,71	,893
7	I can select research data repositories that help me publish open research data according to my preferences	1,74	,886
8	I have a prior idea on Re3data registry	1,57	,815
9	I think the Re3data serves as a global registry for documenting open research data repositories with descriptive and instructional information	2,29	,667
10	I have previously had experience using the Re3data registry to access open research data	1,57	,815
11	The filtering parameters provided by the Re3data registry assist me in searching for open research data repositories	2,17	,514
12	The filtering parameters provided by the Re3data registry assist me access to open research data repositories in a precise and efficient manner	2,23	,547
13	I have the ability to acquire skills in using open research data repositories	2,80	,531
General mean and general standard deviation		2,13	,719

Source: Prepared by the authors using the SPSS package

Table 04 shows that the researchers possess moderate skills in using open research data repositories indexed in Re3data with a disparity in the level of their skills according to the value of the general arithmetic mean of (2.13) and the general standard deviation estimated at (0.719), where the arithmetic means range between (2.80 and 1. 57), where the highest was for statement 13, which indicates their ability to acquire the skills of using research data repositories. 57), where the highest was for statement 13, which indicates their ability to acquire the skills of using

research data repositories, which confirms their urgent need to develop their scientific skills in this regard despite their knowledge of the concept of these repositories from the theoretical point of view, according to the value of the arithmetic mean for statement 01 estimated at (2.54), which explains the average degree of agreement for statements 02, 03, 06, 07, 08, 10, 11 and 12, which express their experience related to the actual use of the indexed repositories in Re3data.

It should also be noted that there is moderate knowledge of the Re3data registry, and therefore a significant number of researchers are not aware of Re3data, its uses and the facilities it offers to access repositories that provide open research data that meet their needs and also provide alternatives to publish their research data according to the best practices that suit their orientations.

Therefore, researchers at the Algerian Center for Research in the Environment need programs to develop their awareness and skills in using the open research data repositories listed in the registry through training workshops, which contributes to increasing the visibility of the scientific research supervised by the center and the effective and efficient use of the repositories.

5-2-3- Motivations for using open research data by researchers at the Environmental Research Center :

Researchers' motivation towards using open research data was measured through 14 statements to identify the reasons why they use open research data and the opportunities-~~and incentives~~ it offers them, as shown in the following table:

Table 05: Motivations for researchers to use open research data

N^0	Expressions	mean	Standard deviation
1	I use open research data because I can retain it	2,57	,608
2	Open research data helps in obtaining preliminary indicators for the application of scientific research	2,71	,667
3	I use open research data because it is modifiable and can be derived from again	2,60	,604
4	Open research data assists in understanding the progress of research activities	2,66	,725
5	I use open research data because it is reusable	2,58	,608
6	Open research data helps in the precise understanding of research	2,49	,818

	problems		
7	I use open research data because it is redistributable	2,64	,553
8	Open research data accelerates the pace of preparing scientific research	2,17	,985
9	I use open research data to enable peer review and expert evaluation	2,31	,900
10	Open research data reduces the cost and effort in preparing scientific research	2,74	,657
11	I use open research data because it is free of charge	2,85	,514
12	Open research data helps in reinforcing the results I have reached in scientific research	2,09	,981
13	I use open research data because it can be protected using open licenses	2,29	,646
14	Open research data helps in achieving greater reliability and transparency of scientific research results	2,04	,970
General mean and general standard deviation		2,40	,619

Source: Prepared by the authors using the SPSS package

It is clear from Table 05 that there is a high motivation of researchers towards using open research data with a significant difference in this according to the value of the general arithmetic mean estimated at (2.40) and the general standard deviation estimated at (0.619), the main reason for this is that research data is of great importance in supporting scientific research activities and raising the level of research performance.

The arithmetic mean ranges between (2.85 and 2.04), where the highest value returned to statement 11, through which researchers believe that access to research data is not financially rewarded, so they need it, especially since it is open according to the five permissions that characterize open content, whether it is retention, modifiability, revisability, derivability, reusability and redistributability, and this is confirmed by the high approval of statements 01, 03, 05 and 07, whose arithmetic mean values range between (2.64 and 2.57). 64 and 2.57, so researchers are in need of this data.

As for the lowest value, it belongs to statement 14, which shows moderate satisfaction with the reliability and credibility of open research data, which explains the moderate approval of statements 08, 09, 12 and 13, as researchers believe that the level of credibility and reliability does not allow accelerating the pace of scientific research and supporting its outputs because they are not subject to rigorous scientific arbitration by experts in addition to being subject to open licenses, and these licenses, according to their opinion, are not subject to a high degree of credibility.

Nevertheless, there are many incentives that push researchers to use open research data, as it is considered a means of laying the foundations and initial premises during all scientific research activities, according to the arithmetic mean of statements 02 and 04, which reached their arithmetic mean (2.71 and 2.66), in addition to helping researchers scrutinize research issues and formulate them in a form that contributes to the development of research goals that seek to reach acceptable scientific results. 66) in addition to helping researchers to scrutinize research issues and formulate them in a form that contributes to setting research objectives that seek to reach acceptable scientific results, as confirmed by statement 06, which has an arithmetic mean of (2.49), and this last result is consistent with the findings of Khulood Alabri et al. in the part of the study related to the nature of secondary motivations.

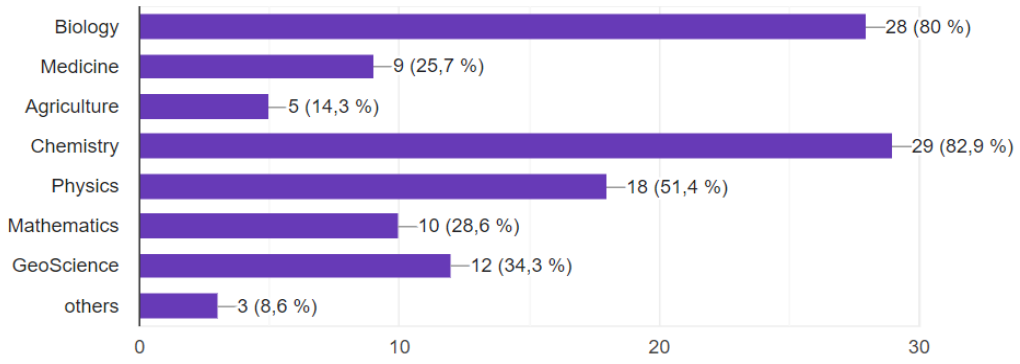
5-2-4- Nature of open research data preferred for use by researchers :

The nature of the open research data used was determined by two elements:

A) The topics of the open research data used:

By identifying the exact thematic specializations that researchers tend to use according to their research needs and interests within the fields of natural and life sciences, and the following figure illustrates this:

Figure 05: Thematic specializations of open research data that researchers prefer to use



Source: Prepared by the authors based on Google Forms

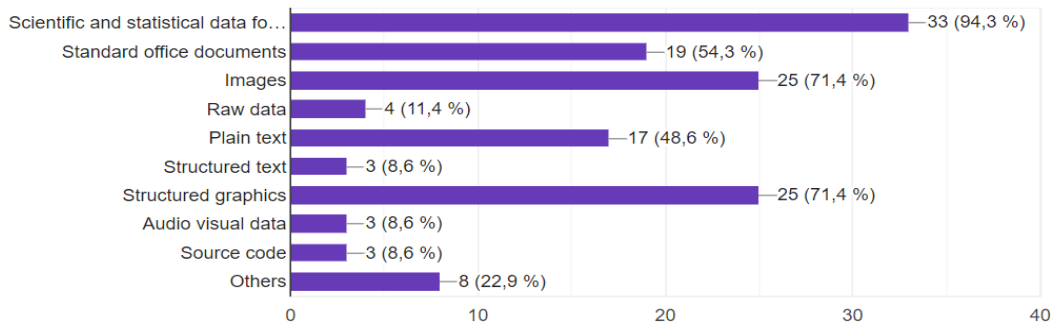
It is noted from Figure 05 that researchers prefer to use open research data specialized in chemistry and biology by a large percentage estimated at (82.9% and 80%), which indicates that the nature of the research carried out by the research center is based on the applications of chemistry in the biological field to study various chemical analyses and predict environmental phenomena based on biochemical analyses, then comes open research data in the field of physics to study physical and chemical phenomena and the composition of materials with a percentage equal to (51.4%), while in fourth place we find data specialized in earth sciences (34%), which helps in studying climate change, according to the interests of the research department that specializes in this, which needs data in the field of mathematics to help them formulate equations for accurate description. 3%), which helps to study climate change according to the interests of the research department specialized in this, which needs data in the field of mathematics to help them formulate equations in order to accurately describe and predict the climate, which made (28.6%) of researchers prefer to use it, while (25.7%) of researchers use open data in the field of physics to study physical and chemical phenomena and the composition of materials. 7 % of researchers use open data in medical research to study the impact of environmental systems on human and animal health and pollution, while the lowest percentage (14.3%) of researchers use open research data in agriculture, which can be explained by the weak orientation towards research related to the development of agricultural products and hybridization of plant seedlings.

Through the above, we conclude that the specialized open research data in the field of natural and life sciences available through the indexed repositories in Re3data can contribute significantly and directly to support the research supervised by the Center and its four departments mentioned in Table 01 and publish them according to standard best practices that increase their visibility.

b) Formats of open research data used:

By identifying the forms of content that researchers prefer to use according to what suits their research and the capabilities and skills they possess:

Figure 06: Forms of research data used



Prepared by the authors based on Google Forms :**Source**

It is clear from Figure 06 that (94.3%) of researchers prefer to use open research data in the form of scientific and statistical data due to its ease of use and handling, especially the process of analyzing it automatically or by human reading, and it is the most available form of data according to the result of analyzing Figure 04, while (71. 4% of researchers prefer to use open research data in the form of images and structured graphics due to their reliance on diagrams and illustrations in the study of ecosystems as they are more compatible with research related to biology and nature studies, which also requires data in the form of standard office documents and Plain text, which can be used by researchers in a lower percentage, with (54.3% and 48. (54.3% and 48.6%) respectively, while we find that the use of data was weak in data in Raw data, Sructured text and Audio visual, and Source code unlike Turkish researchers according to the study of Gulda dogan et al. This can be explained by the fact that they use processed data and not in its raw form or find it difficult to access other forms, or it does not meet their research needs, especially since there are few indexed repositories in Re3data that provide data in Audio visual or Source code compared to the rest of the forms according to the results of Figure 04.

Therefore, we conclude that there is a relative congruence between the most available data formats and the data formats that researchers at the Algerian Center for Environmental Research prefer to use, which helps them reduce the effort and time in accessing and using research data in their research and then republishing their original research in academic digital spaces.

5-2-5- difficulties in using the open research data repositories listed in the Re3data registry:

Difficulties were monitored according to two levels and each level includes 07 statements:

A) Difficulties related to the use of content (open research data):

Table 06: Researchers' difficulties in using open research data

N^0	Expressions	mean	Standard deviation
01	I find difficulties in dealing with intellectual property issues of open research data	1,37	,731
02	I find difficulties in dealing with the privacy, confidentiality and security of open research data	1,37	,770
03	I find difficulties in long-term preservation of open research data	2,06	,998

04	I find difficulties in accessing recent open research data	2,83	,514
05	I find difficulties in dealing with open research data in the English language	1,17	,568
06	I find difficulties in dealing with open research data in other languages	2,77	,646
07	I find difficulties in using open research data characterized by quality and reliability	2,89	,404
General mean and general standard deviation		2,17	,453

Source: Prepared by the authors using the SPSS package

Table 06 indicates that the general arithmetic mean value is (2.17) and the general standard deviation value is (0.453), which indicates the existence of difficulties facing researchers in using open research data, mainly related to the nature of the content on average with a difference between them, as the arithmetic mean values ranged between (2.89 and 1. 17), the highest value was for statement 07, which indicates difficulties in using open research data characterized by quality and credibility, which confirms the validity of the result obtained through statement 14 of Table 05. The highest value was for statement 07, which indicates that there are difficulties in using open research data characterized by quality and credibility, which confirms the validity of the result reached through statement 14 of Table 05, and the lowest value was for statement 05, which shows that researchers face difficulties in dealing with open research data available in English to a weak degree, which also confirms the ability of researchers and their possession of academic research and writing skills in English as stated in statement 07 of Table 03, and it should also be noted that researchers face difficulties related to accessing the latest open research data The field of natural and life sciences, specifically the environmental field, deals with research samples that include living organisms that differ from those data related to human beings and their behaviors and characteristics, as well as dealing largely with Copyrights licenses that do not allow for the assignment of rights according to the five permissions of open content in intellectual property cases, while researchers face difficulties related to long-term preservation to a moderate degree because they do not use repositories significantly in preserving and making research data available, but publish them in the form of articles published in peer-reviewed journals.

b) Difficulties related to open research data infrastructure (Re3data's cataloged repository systems):

Table 07: Researchers' difficulties in using open research data infrastructure

N^0	Expressions	mean	Standard deviation
08	I find difficulties in using the Re3data registry	2,09	,781

09	I find difficulties in using open research data repositories	2,17	,891
10	I find difficulties in handling the different extensions of open research data files	2,00	,939
11	I find difficulties in obtaining the metadata for the open research data	2,06	,591
12	I find difficulties in using tools that help me analyze the open research data	1,74	,950
13	I find difficulties in presenting the open research data according to my research needs	2,00	1,000
14	I find difficulties in the interoperability and migration of open research data	2,20	,473
General mean and general standard deviation		2,04	,497

Source: Prepared by the authors using the SPSS package

It is clear from Table 07 that there are moderate difficulties facing researchers in dealing with the infrastructure that enables them to use open research data, with a disparity between them in this regard, according to the general arithmetic mean value estimated at (2.04) and the general standard deviation estimated at (0.07).

(2.04) and the general standard deviation estimated at (0.497), where the difficulties related to data interoperability between repositories is the biggest issue according to the arithmetic mean value of statement 14, which amounted to (2.20), followed by difficulties related to using open research data repositories with an arithmetic mean equal to (2.17), and difficulties related to using the Re3data registry with an arithmetic mean of (2.09). This result confirms the weak skills of some researchers in using the repositories listed in Re3data, which was found through the value of the overall arithmetic mean of Table 04. We also note that the lowest value of the arithmetic mean (1.74) was for statement 12, which indicates that the process of analyzing data using digital tools is not very difficult, and this can be attributed mainly to the development of hardware and software that help them, especially since they rely heavily on artificial intelligence techniques.

5.3 - Analysis of variance in researchers' attitudes towards using open research data in the field of natural and life sciences available via Re3data indexed repositories:

In order to explore and analyze the variance of differences in researchers' attitudes towards the use of open research data available via Re3data repositories according to the variable of belonging to one of the research departments of the Environmental Research Center represented in 04 groups, the Kruskal Wallis analysis of variance model was used which is considered one of the nonparametric tests because the distribution of the study data is not normal based on the Kolmogrov- Smirnov and Shapiro Wilk normality test as shown in the following table:

Table 08: Results of the test of normality of the distribution of the study data

Normality Tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistics	ddl	Sig.	Statistics	ddl	Sig.
Researchers' skills in using open research data	,448	35	,000	,584	35	,000
Researchers' skills in using research data repositories indexed in Re3data registry	,448	35	,000	,584	35	,000
Motivations for using	,296	35	,000	,765	35	,000
h Data Used						
open research data by researchers at the Environmental Research Center						
Scientific subjects of Open Research Data Used	,513	35	,000	,418	35	,000
	,502	35	,000	,458	35	,000
Difficulties Related to Open Research Data Content	,448	35	,000	,606	35	,000
Infrastructure Difficulties related to the use of open research data	,386	35	,000	,637	35	,000

Source: Prepared by the authors using the SPSS package

As shown in Table 08, the significance level (Sig) is less than the assumed significance level (5%) in all study dimensions, indicating that the distribution is not normal due to the small size of the study population..

Below is a presentation of the results and analysis of the variance in differences among researchers according to the groups of research departments and based on the axes used in studying researchers' trends.

Table No. 09: Analysis of Variance Differences According to the Kruskal-Wallis Test Model

	Q^2	**Degree of freedom**	Sig	**Decision**
Researchers' skills in using open research data	1,948	3	,583	**No significance**
Researchers' skills in using research data repositories indexed in Re3data registry	1,948	3	,583	**No significance**
Motivations for using open research data by researchers at the Environmental Research Center	7,098	3	, 069	**No significance**
Scientific subjects of Open Research Data Used	10,918	3	,172	**No significance**
Countent type of Open Research Data Used	10,918	3	,012	**significance**
Difficulties Related to Open Research Data Content	1,333	3	,721	**No significance**
Infrastructure Difficulties related to the use of open research data	6,184	3	,103	**No significance**

Source: Prepared by the authors using the SPSS package

It is clear from Table 09 that there are no differences and differences in researchers' attitudes towards the use of open research data in the field of natural and life sciences available through Re3data repositories except for the differences between researchers related to the forms of open research data used because the value of significant significance (Sig) is less than (5%) unlike the rest of the significance values for the rest of the axes adopted in the study of researchers' attitudes.

6. Conclusion:

As a conclusion to this research paper, it can be said that there is a trend towards the use of open research data in the fields of natural and life sciences available through the repositories indexed in Re3data by the researchers of the Environment Research Center due to their awareness of the importance of this content in scientific research and academic communication. Acquiring skills in using open research data and its repositories through Re3data allows researchers to improve their overall communicative experience. Such skills facilitate access to, use of, and

dissemination of this data, enabling researchers to overcome various potential challenges. This is essential for implementing an effective communication strategy for the center—a strategy based on the optimal use of open research data to attain the highest levels of scientific satisfaction.
The following are the main conclusions reached:
Open research data repositories are classified according to the topics of the natural and life sciences fields into specialized repositories in the life sciences, which are subdivided into 03 sub-topics: biology, medicine, and agriculture, while specialized repositories in the field of natural sciences are subdivided into chemistry, physics, mathematics, and earth sciences.

The United States of America is one of the most supportive countries for open research data repositories in the field of natural and life sciences, followed by Canada in second place. In terms of language distribution, we find that English is the most commonly used language in making open research data available through Re3data repositories, while data in the form of scientific and statistical data and standard office documents are the most supported and available.

Researchers belonging to the Algerian Center for Environmental Research possess high skills that enable them to use open research data because they are aware of its concept and their ability to deal with it, whether in the process of research, access, analysis, or derivation to produce new research data, and then republish it within frameworks that allow protecting its intellectual property, especially by using Copyrights licenses.

Researchers at the Algerian Center for Environmental Research have intermediate skills that enable them to use open research data repositories and, to a lesser extent, the Re3data registry and the services it provides due to their lack of prior experience in this regard.

There are a set of reasons and incentives that motivate researchers at the Algerian Center for Environmental Research to use open research data. The reasons are related to the five permissions that determine the levels of openness in the content, while the incentives are the opportunities it offers to researchers such as reducing research costs and giving preliminary indications of the course of research activities, despite the existence of some obstacles represented in the credibility and quality of open research data.

Open research data available in the form of scientific and statistical data, images, and structured graphics are among the most used forms of content by researchers at the Algerian Center for Environmental Research.

Open research data related to the thematic disciplines of chemistry, biology, and physics are the most interesting to researchers at the Algerian Center for Environmental Research.

Researchers at the Algerian Center for Environmental Research face moderate difficulties in their use of open research data, mainly related to the quality and freshness of the data in terms of

content, while in terms of infrastructure, they face difficulties related to data interoperability technologies and standard protocols to migrate them between databases and digital spaces.

Through our findings, we can propose some guidelines and practices that would enhance researchers' attitudes in using open research data and improve their experience in doing so:

Coordinating efforts between researchers affiliated with the center and its administrators to develop a comprehensive communication strategy that takes into consideration the research data produced and its deposit through repositories indexed in Re3data. This approach is particularly significant given the emerging trend toward utilizing repositories that accommodate this type of data, as researchers possess the requisite skills for repository utilization and demonstrate motivation toward satisfying diverse research needs within a collaborative vision that extends beyond the center itself to encompass all active partners in the environmental field. These partners include the General Directorate of Research and Technological Development, the Ministry of Environment and Quality of Life along with its subsidiary directorates, associations, and civil society representatives. The ultimate objective is to expand the scope of scientific communication and achieve socio-economic benefits.

The need to expand the use of the concept of open research data and its indexed repositories in Re3data among permanent researchers at the Environment Research Center.

Organizing training workshops by developing programs to develop research data mining skills and access sources, similar to academic open data directories and repositories, in line with the open science movement and developments in digital spaces.

Raising researchers' awareness of the importance of adhering to standard specifications and guiding standards when making open research data sets available by relying on Metadata standards and open use licenses such as Creative Commons licenses to ensure their long-term preservation and retrieval according to digital best practices in addition to interoperability in order to create opportunities for cooperation and clustering between research institutions and centers locally and internationally.

7- References list :

1. Alabri, Khuloud., & Others. (2021, june). The motives and fields of using open government data by researchers in the college of arts and social sciences at Sultan Kaboos university. *cybrarians journal*(N. 62). Retrieved 03 20, 2025, from https://journal.cybrarians.info/index.php/cj/article/view/19/20
2. Azeroual, Otmane., & Others. (2022). Putting FAIR principales in thecontext of research information: FAIRness for CRIS and CRIS for FAIRness. *14th international conference on knowledge management and information systems.* Retrieved 03 10, 2025, from https://hal.science/hal-03836525/file/KMIS2022_Azeroual-Schopfel-Polonen-Nikiforova_FAIR-principles.pdf

3. CRE. (2025). *Presentation about the center*. Retrieved 04 01, 2025, from CRE.dz: https://cre.dz/index.php/fr/qui-sommes-nous-2/presentation

4. Dogan, G., & Others. (2021, March). Research data management in turkey: A servey to build an effective national data repository. *IFLA journal, v. 47*(n.1). Retrieved 03 20, 2025, from https://repository.ifla.org/server/api/core/bitstreams/5d03f443-eee7-49cf-995e-5437ba97551b/content

5. El-sayed, Amani.-M., & Others. (2018, december). Research data management and sharing among researchers in arab universities: An exploratory study. *IFLA journal, v.44*(n. 4). Retrieved 04 02, 2025, from https://repository.ifla.org/server/api/core/bitstreams/cedf364f-8377-4f0c-8f13-447dfdce8be8/content

6. Mohamed, A., Abdelbasset, S., & Taha, A. (2021, 10). Research data and its repositories in universities: theoritical study. *Egyptian journal of information sciences, V.8*(N.2). Retrieved 03 10, 2025, from https://jesi.journals.ekb.eg/article_221530_76da9385c3c95c79c91ef7c0b7d531bc.pdf

7. Re3data. (2025). Search. Retrieved 05 15, 2025, from https://www.re3data.org/search?query=&dataAccess%5B%5D=open&databaseAccess%5B%5D=open

8. Re3data. (2025). *About re3data*. Retrieved 05 16, 2025, from Re3data.org: https://www.re3data.org/about

9. UNESCO. (2021). *Unesco Recommandation fo Open science.* Retrieved 05 25, 2025, from https://www.unesco.it/wp-content/uploads/2023/11/RECOMMENDATION-ON-OPEN-SCIENCE-2021-Certified.pdf