



D3 – Analysis of existing potentials for the establishment of a social  
science

digital data archive in Montenegro



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Name	Short Name	Country
Centre for Monitoring and Research, Podgorica	CeMI	Montenegro
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Institute of Economic Sciences, Belgrade	IES	Serbia
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## Table of Contents

1. Introduction .....	4
2. Methodology overview .....	4
2.1 The interview guide for research policy and funding institutions .....	5
2.2 The questionnaire for researchers.....	5
2.3 The interview guide for research infrastructure institutions .....	5
3. Legal and institutional frameworks .....	6
4. Survey on production, preservation and use of research data among researchers.....	8
4.1 Introduction and methodology.....	8
4.2 Characteristics of Respondents.....	8
4.3 Producing data .....	11
4.4 Methods of Data Gathering .....	13
4.5 Sources of funding research .....	14
4.6 Archiving practice and preferences .....	14
4.8 Attitudes towards data sharing and existence of national data archive .....	21
4.9 Comments and remarks from researchers .....	23
5. Interviews with stakeholders .....	25
6. Recommendations .....	25
7. Annexes.....	26
Annex 1. List of interviews .....	26
Annex 2. Questionnaires.....	27

## 1. Introduction

Social sciences have always depended on the secondary analysis of data to address new research questions about society, politics, and economics, which is ever more important in a research landscape where funding for new data collections is increasingly more difficult to come by, and where governments expect more intensive exploitation of rich and existing publicly funded data to advance science. It is primarily for this reason that national ministries of European countries and the European Commission have invested heavily in the last few decades in data service infrastructures that curate and preserve digital social science data and make these available free of charge to the research community for secondary analyses. National data services offer large collections of important data for re-use, thus reducing the costs for new collections. The “Open data” movement in Europe in recent years has greatly strengthened the need for such infrastructures, and practices geared toward secondary analysis are slowly changing the ways in which research is carried out, with more emphasis on data sharing, best practices in data management, and documentation.<sup>1</sup>

Many European countries now have long-established data services, many belonging to the international umbrella network of data services CESSDA – Consortium of European Social Science Data Archives. Yet, many European countries still do not have national data services, and so a great deal of original research data is lost and remains forever out of reach. Efforts are now being made at the European level to redress this problem and to establish new data services in countries where none exist to date. The successful FP7 project SERSCIDA (January 2012 – June 2014), funded by the European Commission, aimed to help establish data services in three West Balkan countries (Bosnia and Herzegovina, Croatia and Serbia). It involved intensive training, organisation building, development of technical infrastructure, and promotion and outreach activities. One lesson from SERSCIDA was that its model proved effective and could be extended to other countries with no existing data services.

*South-Eastern European Data Services – SEEDS* is an international project aimed at establishing a permanent infrastructure for archiving data obtained from researchers within the social sciences in countries in which this project is implemented (Montenegro, Kosovo, Albania and Macedonia), as well as enabling secondary analysis of data produced by other researchers.<sup>2</sup>

Target groups of this project are: key decision makers (key state institutions such as Ministry of Science, Ministry of Education and Ministry for Information Society and Telecommunications), the scientific community in the area of social sciences in Montenegro, as well as the general public.

## 2. Methodology overview<sup>3</sup>

To collect the information which could illustrate the existing potential and areas to be improved on, three main groups of stakeholders who can play an important role in establishing, maintaining, and using a data archive were identified. These three groups are:

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<sup>1</sup> More information available at [http://seedsproject.ch/?page\\_id=2](http://seedsproject.ch/?page_id=2)

<sup>2</sup> More information about this project available at <http://seedsproject.ch/>

<sup>3</sup> In this part, SEEDS has benefited from the SERSCIDA project. More information on methodology used in SERSCIDA is available in the report “Analysis of existing potentials for the establishment of a social sciences digital data base archive in Croatia”.

- Research policy and funding bodies;
- Research/data service infrastructure institutions; and
- Researchers.

Considering the research policy and funding bodies, the survey aimed to assess the support for the establishment a data archive both in financial terms and in a research policy setting. The research infrastructures can provide both technical infrastructure, such as servers and data capacity, and more service oriented infrastructure, such as survey collection software. When addressing the research infrastructure, institutions undertaking research in the social sciences were included as well.

Due to the difference between the three groups, a general survey which would cover all groups was not practical. Instead, the instrument for each group was designed to fit the specific characteristics of that group. In producing the instruments, SEEDS has benefited from experience from similar instruments developed by the SERSCIDA project.

Each survey instrument is presented briefly below, with the main areas of interest and how the data collection was done.

### ***2.1 The interview guide for research policy and funding institutions***

In this case the ministry which handles the research policies in Montenegro, as well as the major research funders, were interviewed face to face. The purpose was to establish contact and determine the possibilities for financing a data archive both in the establishment phase and in the long-term. This also included questions and discussions about whether the funders had any requirements related to research data, for example archiving of data or open access. To these questions of requirements on archiving of research data, information was also sought as to whether the current science policy includes anything regarding archiving research data. Another crucial question in this context was the ministry's and funders' views of whether data archiving should be carried out at national or local level.

### ***2.2 The questionnaire for researchers***

The instrument which was designed to collect information on the production, preservation, and use of research data in the social sciences is an online survey questionnaire. The questionnaire collected information about researchers' experience of documentation, re-use and dissemination of research data, but also about which types of statistical/analytical software packages, methodology and data are primarily used in their research. In addition to these areas the researchers were also asked if their institution had any policy regarding long-term preservation and/or documentation of data. This gives a brief overview of the demand for data, training and support and the supply of data and of experience with documentation.

### ***2.3 The interview guide for research infrastructure institutions***

The instrument which was designed for the research infrastructures was a semi-structured interview/survey. It was conducted face to face with representatives of research infrastructures and research institutions within the social sciences. The respondents were asked to answer questions about whether they could provide technical infrastructure or research services. They were also asked if the institution had any policy or competences for long-term preservation and documentation of data. The institutions and infrastructures were also asked if they had any available technical capacity or data collecting services which could be valuable for the

establishment of a data archive. The survey was also a way of getting in touch with potential future collaborators with the data archive.

### **3. Legal and institutional frameworks**

The government of Montenegro sets the basic principles and guidelines for the development of science and higher education. The two main administrative bodies responsible for the planning, financing, and monitoring of the entire science and education system are the Ministry of Science and Ministry of Education.

**The Ministry of Science** and its **Sector for Scientific Research Activity** perform administrative tasks related to this field and professional tasks related to: the implementation of programs of common interest through which priorities are implemented in this sector; development of plans and programs of scientific research activities; making scientific policy and strategy; proposing and implementing laws and other regulations; harmonization of laws and regulations with EU regulations; drafting regulations on scientific and technological cooperation between Montenegro and other countries (agreements, treaties, protocols, programs); Montenegro's participation in multilateral, regional and bilateral programs and projects relating to science, research and development; project implementation in the field of science financed from the EU pre-accession funds - IPA and other international funds; implementation of bilateral scientific and technological cooperation between Montenegro and other countries; promoting EU Framework Programme and other programs of international cooperation; organization and coordination of the NCP (National Contact person for the Framework programs) and individual programs or parts of programs; monitoring of the implementation of the strategy of scientific research activities in Montenegro; program of the Ministry for scientific and research activities; report on the work of the Government in the field of scientific research; licensing of research institutions and keeping a register of institutions; management of databases in the field of scientific research activities in accordance with the law; and other activities within its scope.

**The Ministry of Education** is responsible for the development of the higher education system in Montenegro;

**The Ministry for Information Society and Telecommunications** has no direct competences when it comes to establishing research data archives, but gives support regarding software and related issues;

**The Council for Scientific Research Activity** is the body that analyses issues related to science in Montenegro and achievements in scientific research activity, makes expert proposals and opinions regarding all issues in this field, and thus contributes to improving scientific research activity in Montenegro.

When it comes to establishing a research data archive in the social sciences, the above-mentioned implies that the Ministry of Science is competent for its establishment, whereas the Ministry for Information Society and Telecommunications can only give support regarding software and related issues.

The legal framework encompasses:

**The Law on Scientific Research Activity**<sup>4</sup> which regulates archiving data in the field of scientific research activity and which is the competence of the Ministry of Science, but the law does not regulate the issue of research data archives.

**The Law on Archival Activity**<sup>5</sup> which stipulates that archival activity includes: registration, collection, maintenance, processing, protection, selection, use and publication of archival materials, as well as operations and other activities in accordance with the law (Article 2). Archival activity is activity of public interest, which is performed by creators and holders of current records and archival materials and archives. Archival material includes the original and/or reproduced documentary material of permanent significance for science, culture, legal and evidentiary and other needs of individuals and legal entities, which originated from the work or activities of bodies and organisations, legal entities and individuals, regardless of time, place and form of occurrence and the media in which it is contained.

**The Law on Personal Data Protection**<sup>6</sup> regulates the protection of personal data of individuals and the control over the collection, processing and the use of personal data in Montenegro.

**The Law on Copyright and Related Rights**<sup>7</sup> regulates the copyright and related rights, their implementation and protection. Article 1 stipulates that this law establishes the right of authors of literary, scientific and artistic works (copyright), rights of performers, phonogram producers, film producers, broadcasting organisations, publishers and producers of databases (related rights). Article 7 stipulates that independent works are collections of works or other material, including databases, whereby the database is considered a collection of independent works, data or other materials in any form, which is matched in a systematic or methodical way and individually accessible. Protecting the collection by this law does not include protection of its content and does not limit the right to the contents.

**The Strategy of Scientific Research Activity of Montenegro (2008 - 2016)** recognises as one of the weaknesses when it comes to research in Montenegro bad transfer of research data to the market. Also, the issue of intellectual property protection, according to this strategy, is becoming one of the main issues that must be addressed on both an institutional and legal level.

**The Strategy for Development and Funding of Higher Education (2011 - 2020)** recognizes the need of strengthening the research capacities in Montenegro through improving the infrastructure for conducting research, directing professors and teaching assistants towards research activity, and intensifying relations with research centres outside the university and within certain companies.

By reviewing the legal framework, it is obvious that in Montenegro there are laws regulating data archiving, but they are not addressing the issue of archiving of so-called raw data. The current situation regarding the relevant policy documents can be seen as a good opportunity and the right moment to incorporate the developing guidelines into strategic documents and thus ensure a steady sustainability of activities related to data archiving, preservation, and dissemination of the research data in social sciences.

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<sup>4</sup> Law on Scientific Research Activity, Official Gazette of Montenegro No. 80/10

<sup>5</sup> Law on Archival Activity, Official Gazette of Montenegro No. 49/10

<sup>6</sup> Law on Personal Data Protection, Official Gazette of Montenegro No. 79/08

<sup>7</sup> Law on Copyright and Related Rights, Official Gazette of Montenegro No. 37/11



## 4. Survey on production, preservation and use of research data among researchers

### 4.1 Introduction and methodology

Research on the perception and practice of gathering, processing, using and archiving of data in the social science was conducted through an on-line questionnaire, which was developed within the SEEDS project and used at the same time in Montenegro, Albania, Kosovo and Macedonia. The first cycle of data collection was done in September 2015, while, as the response rate was very low, it has been repeated in December 2015, and finished when the total number of completed questionnaires reached 64. Within the data cleaning process it was noticed that one respondent had answered the questionnaire twice, and the total number was reduced to 63. In total, there were 83 researchers who indicated working in Montenegro and started with the survey, out of which 76% (63) completed the questionnaire.

The questionnaire was distributed via e-mail to 336 addresses of researchers, universities, science institutes and civil society organisations, including international organisations, which have a track record in collecting and processing data in the social sciences. The response rate, taking into account only fully completed questionnaires, was approximately 19%.

The survey was divided into the following sections:

- Characteristics of respondents in the sample;
- Producing data;
- Methods of data gathering;
- Archiving practice and preferences;
- Data use and secondary analyses;
- Attitudes towards data sharing and existence of national data archive;
- Comments and remarks from researchers.

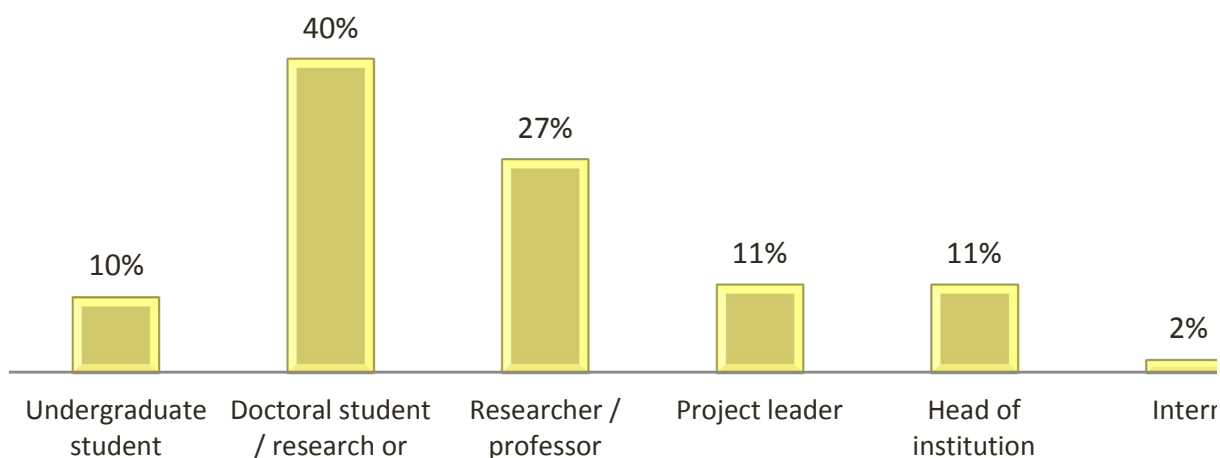
Survey analyzes also provide recommendations drawn from the research.

### 4.2 Characteristics of Respondents

As shown in figure 1, the majority of respondents hold a position of doctoral student, researcher or professor at an academic institution. Out of the total number of 63 respondents, 25 (40%) are doctoral students / research or teaching assistants, 17 (27%) are researchers / professors, 14 (22%) are managers (project leaders or head of an institution), 6 (10%) are undergraduate students while 1 (2%) is an intern in the research institution.

**Figure 1:** Current principal activity of respondents

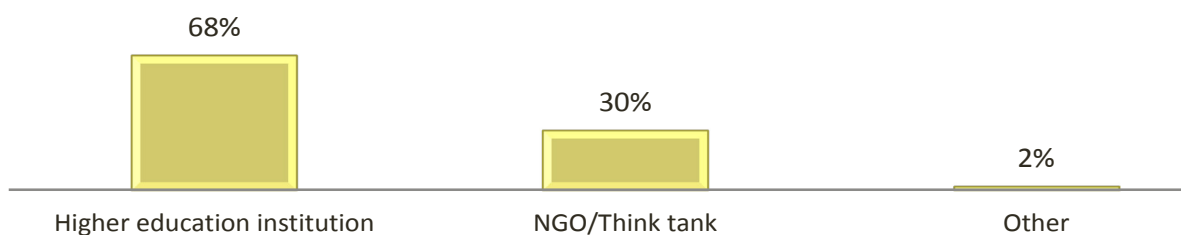
### What is your current principal activity? N=63



The majority of the survey participants who work in Montenegro, were at the moment of the survey principally affiliated with a higher education institution, 43 (68%), while 19 (30%) stated an affiliation to an NGO/Think tank (figure 2). One respondent declared as being affiliated to another public institution. There were no respondents who indicated working in a public research institutes.

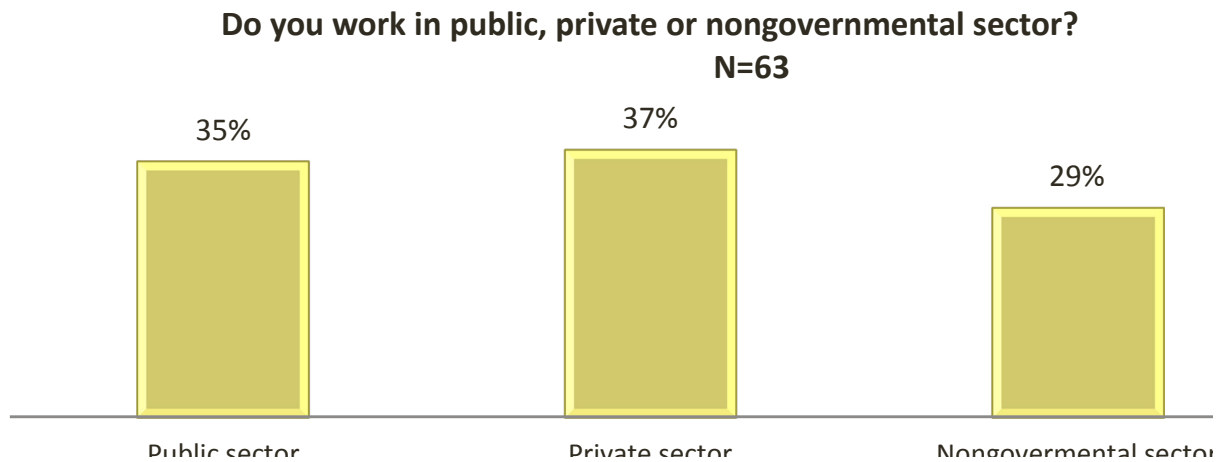
**Figure 2:** Type of institution respondent is currently affiliated with

### With what type of institution are you currently principally affiliated? N=63



Around one-third of respondents or 35% (22 people) stated they work in the public sector (figure 3). In total, 23 people or 37% said they are employed in the private sector, while another 19, or 29% are working in NGOs. Out of 43 respondents who are affiliated principally with a higher education institutions, 47% (20) are working in the public sector, while another 23 (53%) are employed in the private sector. This means also that all respondents who stated to be working in the private sector are affiliated with a private higher institutions. Regarding the NGO/Think tank affiliations, 1 respondent stated working in a public institution, while another 18 were working in NGOs.

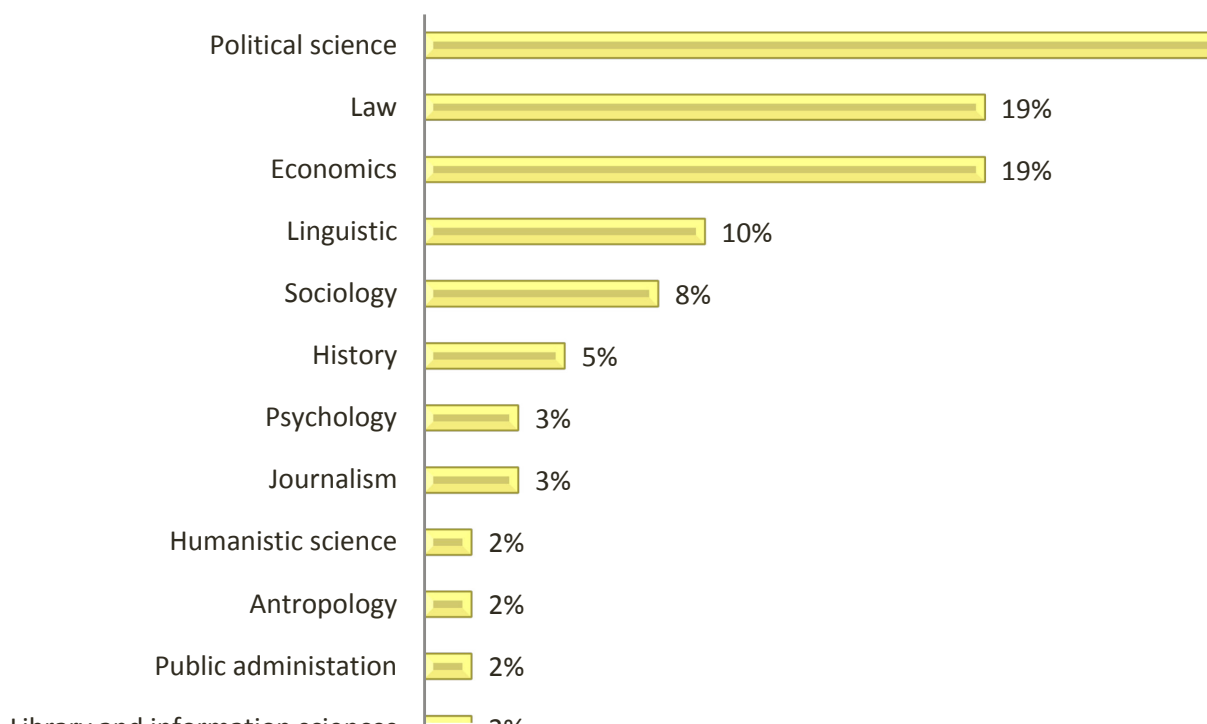
**Figure 3:** Sector of work of respondents



Respondents are working primarily in the following research disciplines, where the order of answers is given by its frequency of appearance (figure 4): **Political science** (27%), **Law** (19%), **Economics** (19%), **Linguistics** (10%), **Sociology** (8%), **History** (5%), **Psychology** (3%), **Journalism** (3%), and one respondents or 2% per following disciplines: Human science, Anthropology, Public administration and Library and information science. Regarding the most frequent disciplines in the sample, with an appearance greater than 5%, it is interesting to mention that all respondents who are engaged in a research in economics and linguistics are affiliated to a higher education institution; there is no such affiliation homogeneity among respondents in this sample who are implementing research in the fields of law or political science, while all respondents that are active in the field of Sociology (5 people) stated an affiliation to Think tanks/NGOs.

**Figure 4:** Principal research discipline of respondents

### What is your principal research discipline? N=63

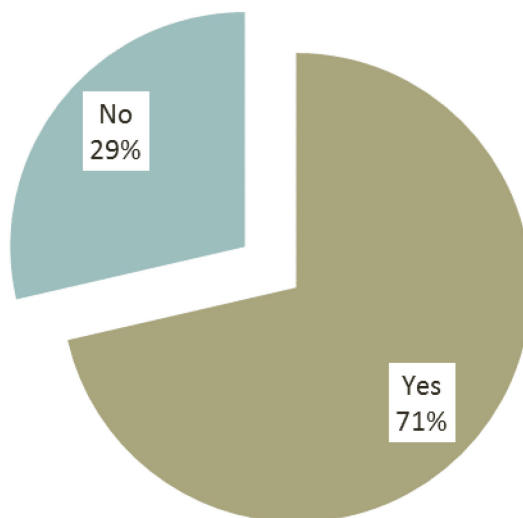


#### 4.3 Producing data

Researchers were asked a set of questions regarding data production. 45 out of 63 participants in the survey, or 71% stated that they have, in fact produced or helped to produce research data within the last 5 years (figure 5). Out of 18 people who were not involved in producing any research data, 10 are doctoral students or teaching assistants, 3 undergraduate students and 1 is an intern. The majority of those 18 people, as we assume, are affiliated with a higher educational institution (15 people). The last finding indicates that it is possible that those respondents, as being affiliated with a research institution will soon be involved in data production in case it is relevant to their field of scientific work.

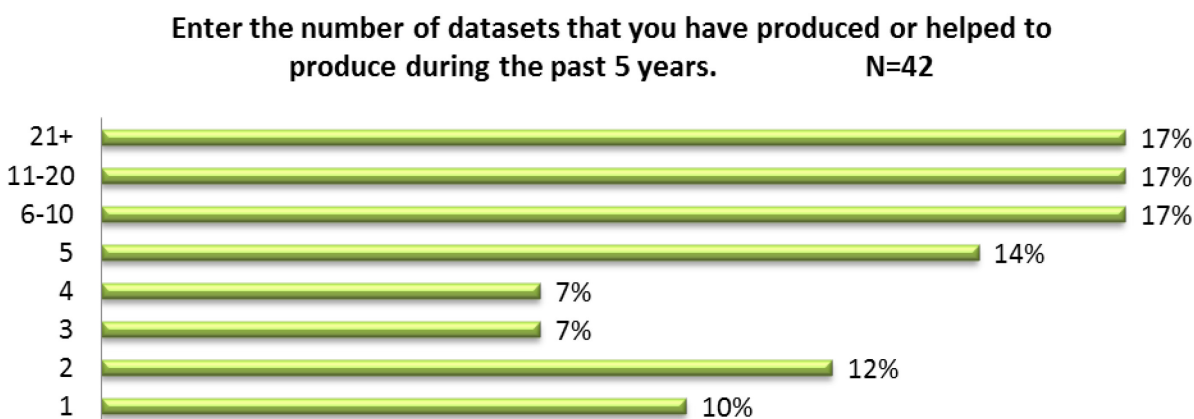
**Figure 5:** Self-reported experience of respondents on data producing in last 5 years

**In the context of your research activity within the past 5 years, did you produce or help in producing any research data? This could be quantitative and/or qualitative data. N=63**



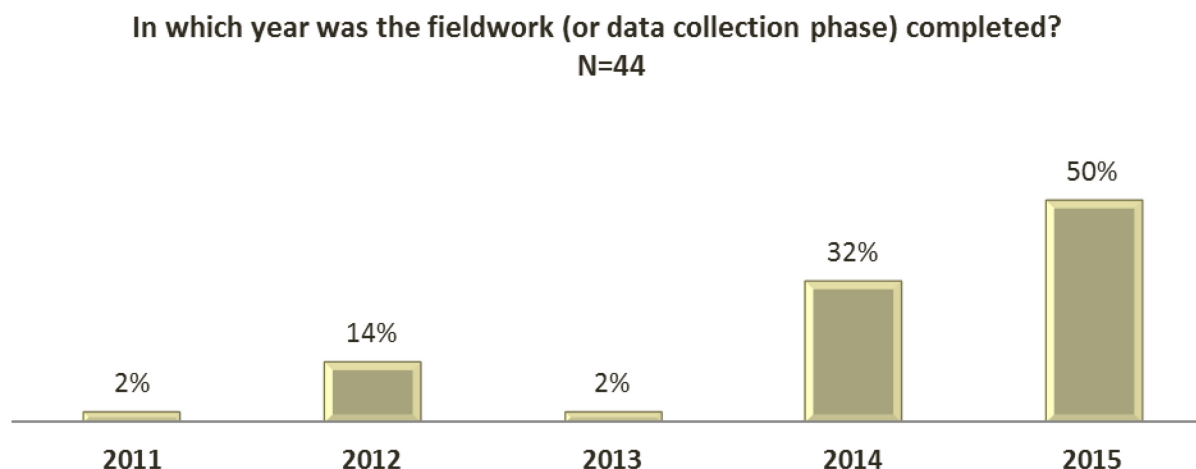
Half of the respondents who provided answers on the number of datasets produced within the last 5 years stated that there were 1 to 5 datasets they were working with (figure 6). One third out of 42 respondents that provided an answer to this question claimed producing more than 11 datasets during the period indicated. Although we cannot talk about these findings being representative to whole population of Montenegrin social science researchers, it could be worth mentioning that in the category of those researchers who reported producing more than 11 datasets in the last 5 years (14 people) 8 respondents are coming from NGOs, 5 from the private sector and one from the public sector.

**Figure 6:** Self-reported number of datasets produced by respondents in the last 5 years



Half of the researchers who have experience in the last 5 years with data collection and processing, have finished with the last filed work or data collection phase quite recently, in 2015, and a very solid majority 82% within the previous two years – in 2014 or 2015 (figure 7). This data is supporting the relevance of the researchers' answers on experiences, opinions and recommendations related with the data gathering and archiving, presented in the following chapters.

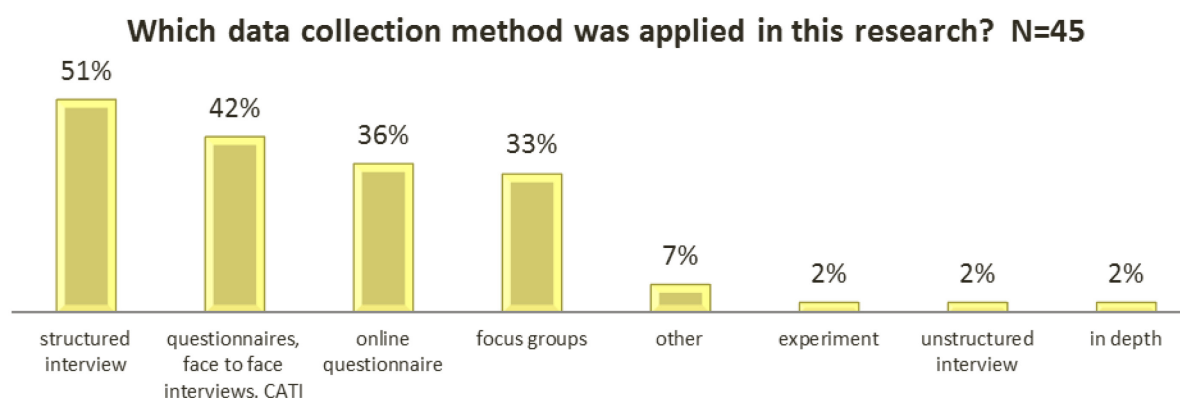
**Figure 7:** Self-reported period of completing data collection phase by respondents in the last 5 years



#### 4.4 Methods of Data Gathering

There were 45 respondents who provided information on the method of data collection within the last research project. A majority mentioned structured interviews as a main method (51%), following quantitative methods: questionnaires, face to face interviews, CATI (42%) (figure 8). Focus groups were indicated by one-third of respondents - 33%. A similar frequency can be found with the usage of online questionnaires (36% of respondents), while some researchers had reported using experiments, archive research, and non-structured interviews as the data collection methods.

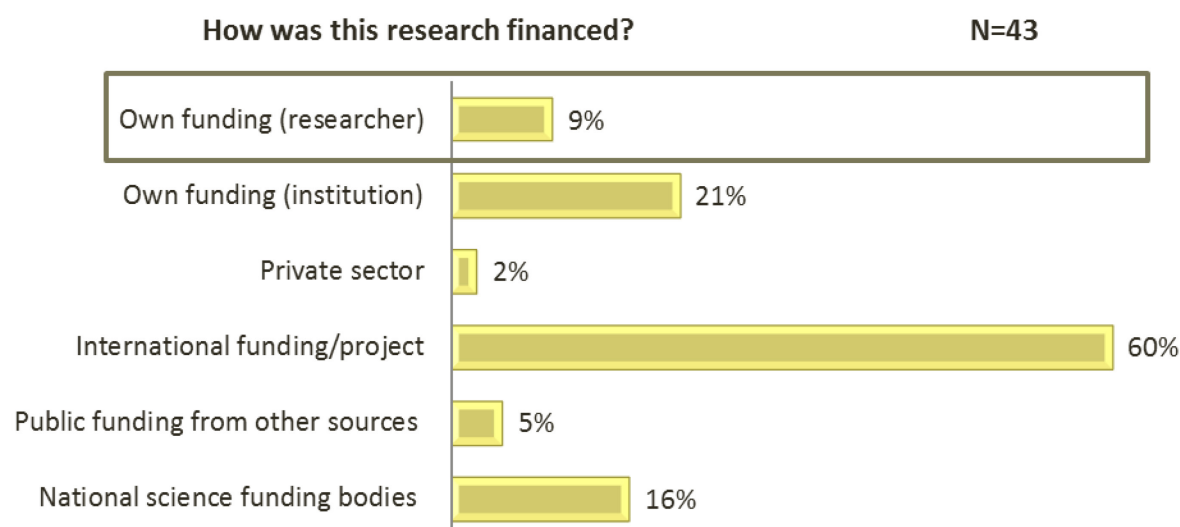
**Figure 8:** Self-reported data collection method within the last research



#### 4.5 Sources of funding research

The dominant way of funding research projects among respondents is through international funding or projects (60%), followed by the funding from the own institution (21%) and the national science funding bodies (16%). It is indicative that there were 9% of respondents who had reported funding research from their own resources (figure 9). Public funding from other sources than national science funding bodies, and funding through the private sector are rarely reported within this survey.

**Figure 9:** Sources of research funding



Regarding size of the team 38 percent of researchers reported 1-3 others working on their research project, while every third (33%) respondents was in team with 4 or 5 other researchers. Usually, teams are not larger than 10 people. Also, it is a rare case when a researcher is implementing a research project alone (Table 1).

**Table 1:** Size of research team

Apart from you, how many researchers were involved in this research project?		
	Frequency	Percent
0	3	7
1-3	17	38
4-5	15	33
6-10	7	16
11+	3	7
Total	45	100,0

#### 4.6 Archiving practice and preferences

Regarding archiving practice and preferences, a majority, 96% of researchers, reported that they are preserving the collected data (figure 10). Among 45 researchers who answered the question, there were only 2 (4%) who reported not keeping/retaining the data.

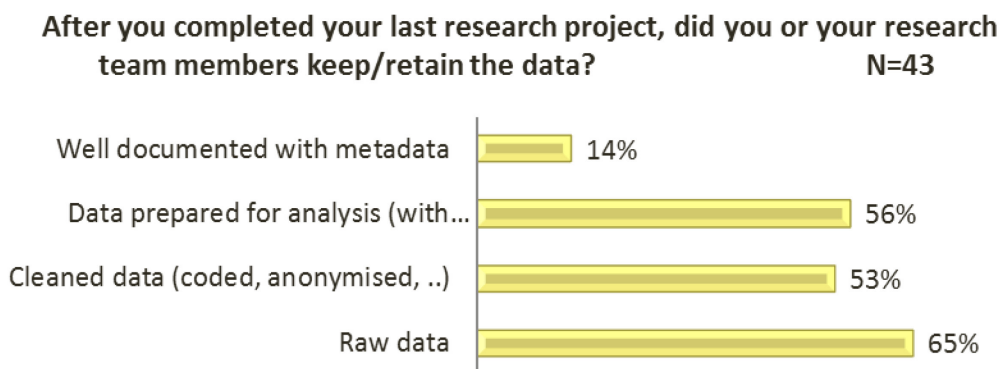
**Figure 10:** Keeping/retaining data after completing last project



Although a majority reported keeping/retaining the data, 43 researchers, when provided with multiple choices of answers, a majority, 65% reported keeping raw data, more than a half (56%) keep data prepared for analysing, 53% retain cleaned data, **while only 14% reported keeping well documented data with metadata (figure 11).**

Not only that data are not well described, but also, standards for data documentation and meta-data are rarely implied. In this sample only 12% among those researchers who keep data are using any internal standards, while only 2% reported using international documentation/metadata standards. More precisely, there was no researcher in this sample who reported using Dublin core (DC) or ISO 11179 documentation/metadata standard for description of their research data, while one (1) reported using the The Data Documentation Initiative (DDI) standard, and 4 their own, internal/institutional documentation standard.

**Figure 11:** Which data were kept/retained after completing last project

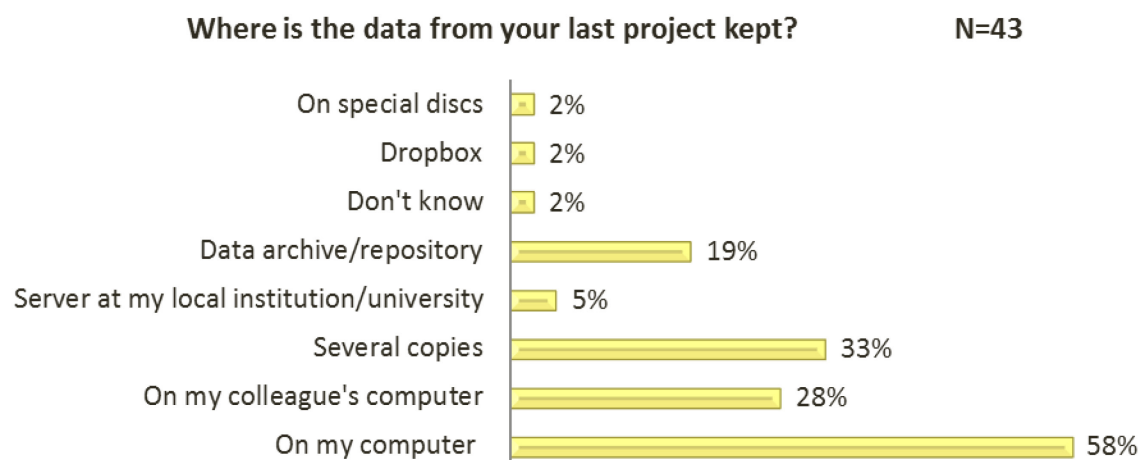


Regarding the location where the data from the last project were kept, a majority of researchers in this sample reported keeping documents on their computer (58%), one-third (33%) reported keeping several copies of the project data, and 28% reported depositing data on a colleague's computer (figure 12). Data archive/repository is a reported choice for 19% out of 43 respondents who answered this question. The server at their local institution/university is quite an unusual place for data deposition for Montenegrin researchers (5% of respondents reported using a local



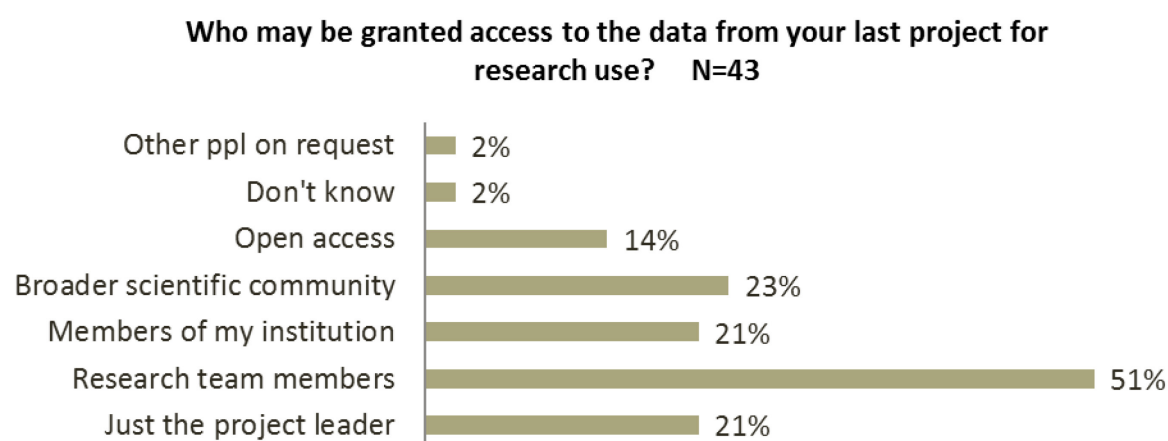
server of the institution). One respondent (2%) reported using special disks, and one other (2%) using another space (Dropbox) for data depositing.

**Figure 12:** Where data were kept after completing last project



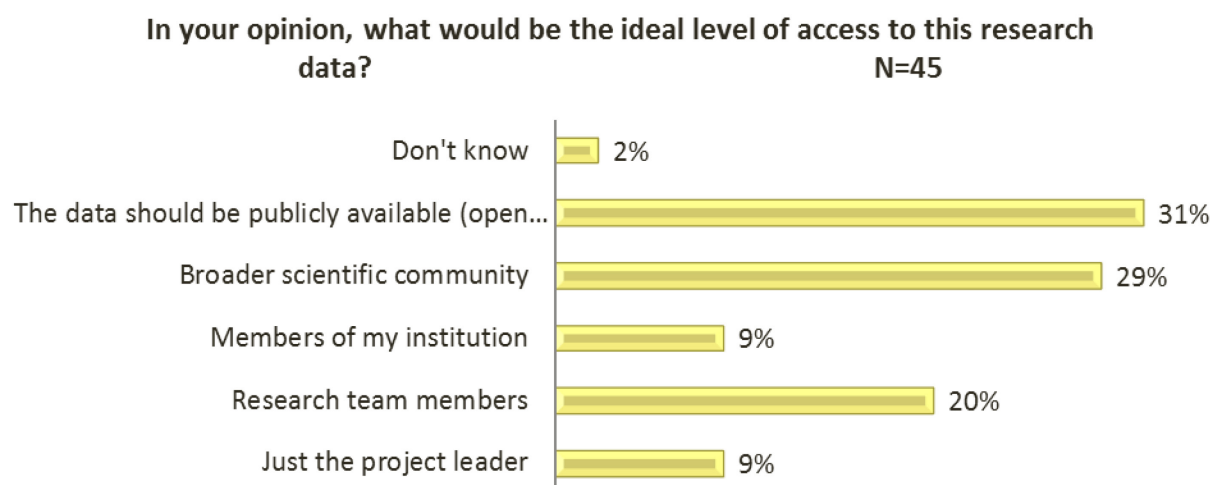
As shown in the figure 13, in the population of respondents who keep data, a bit more than half, (51%), reported that research team members are granted access to the project data from the last project, while for 21%, access is granted only to the project leader. The same frequency, 21% gave the answer “members of my institution“, while 23% reported that access is granted to the broader scientific community. Only 14% of researchers reported that data from their last project are granted to anyone (open access).

**Figure 13:** Who have access to data after completing last project



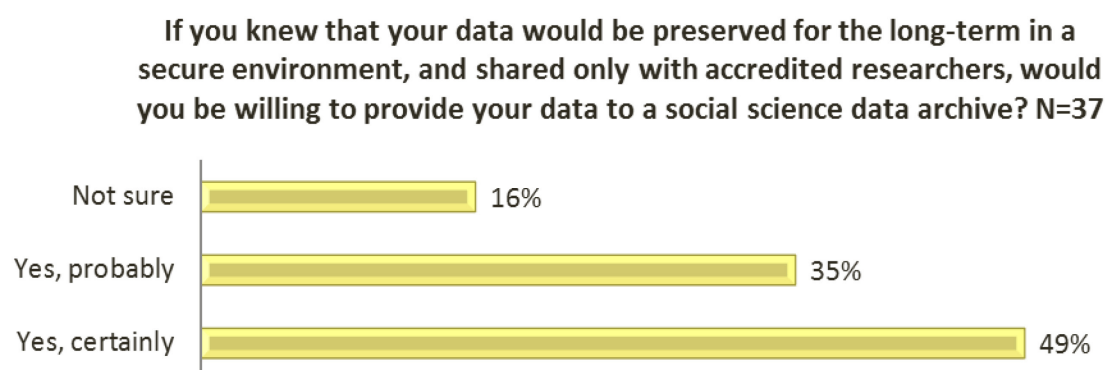
On the other hand, current practice is not what researchers are assuming as an ideal level of access to research data they were working with on their last scientific project. Almost one-third (31%) would prefer to grant open access to their research data, 29% to the broader scientific community, and only 9% to the most restricted level of access – just to the project leader (figure 14). This finding indicates the need for a broader discussion of data keeping, preparing, protecting, archiving and accessing, among the scientific community in Montenegro.

**Figure 14:** Who should have access to data after completing last project, in the ideal case



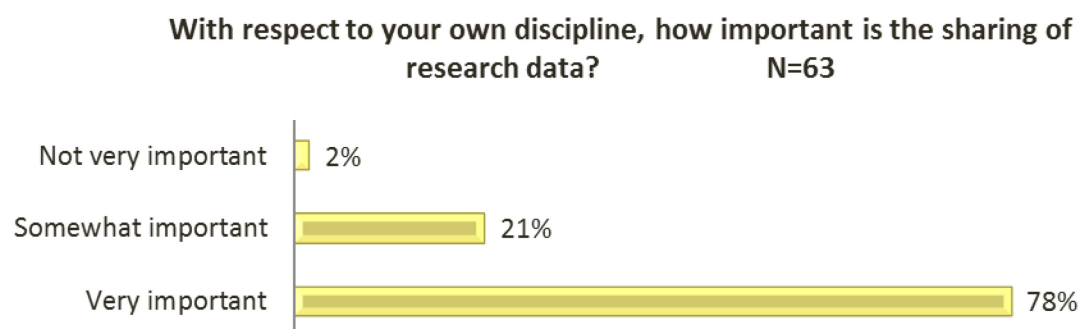
It is very interesting that there were no respondents who reported that he/she would be totally or probably against the idea of providing their data to a social science data archive with guarantees that the data would be preserved for a long time in a secure environment, and shared only with accredited researchers. Almost half (49%) of the respondents reported that they would certainly give their data to a national data archive in that case, while another 35% answered that they would probably provide data to an archive (figure 15). Only 16% were undecided regarding this matter and were not sure what would be their decision regarding data deposit.

**Figure 15:** Attitude towards social science data archive



This survey, at least regarding this sample, shows that for researchers in social sciences sharing of research data is very important in their own discipline. This is the opinion of 78% of respondents, while every fifth 21% stated that it is somewhat important (figure 16). We can conclude that within this sample there is a consensus of social science researchers that sharing of data is important.

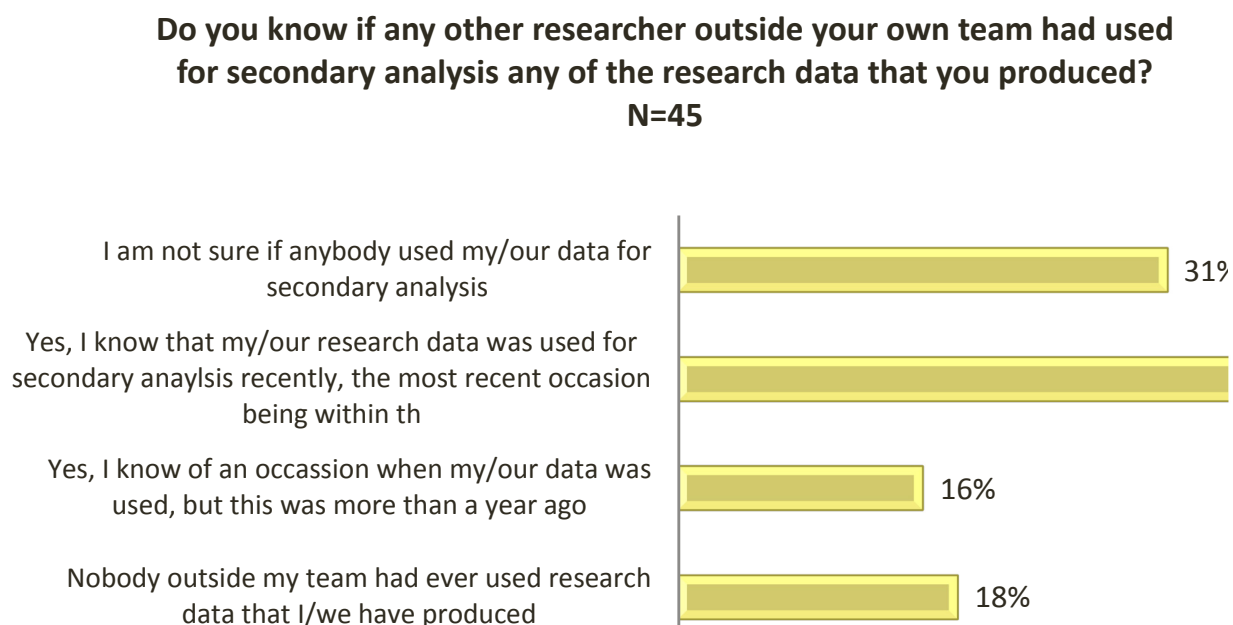
**Figure 16: Importance of data sharing**



#### **4.7 Use of Data and secondary analyses**

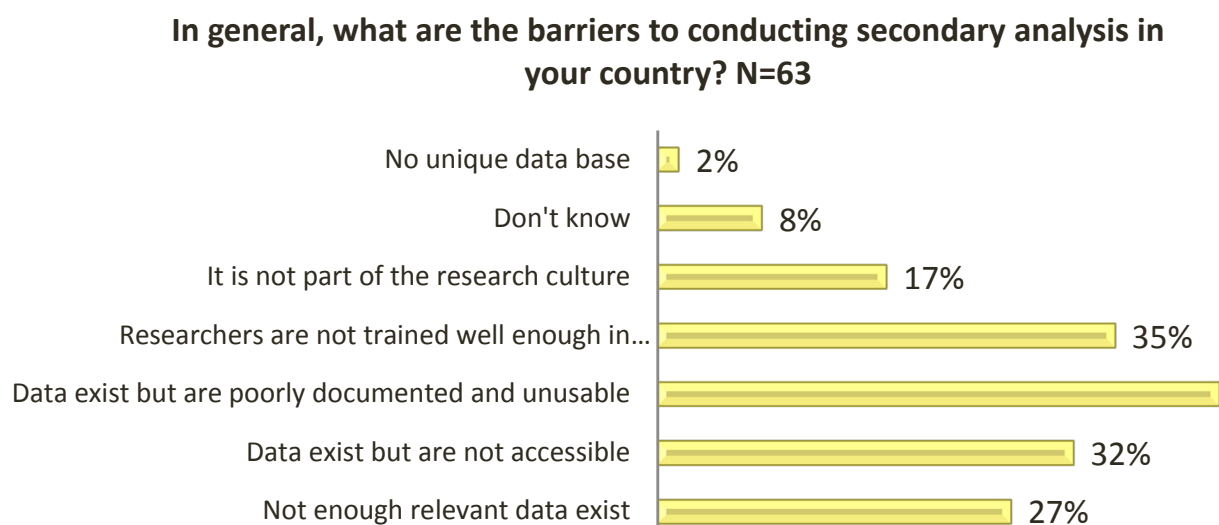
The practice of sharing research data for a secondary analysis exists, as reported by 51% out of the 45 respondents (figure 17). Among those who reported having experienced data sharing with other researchers, 36% stated it was taking place quite recently, within 12 months prior to the survey.

**Figure 17: Data sharing experience**



The most frequent barrier for conducting a secondary analysis in Montenegro, that respondents chose out of given responses was that 'the data are existing but are poorly documented and usable' (43%), followed by the statement that 'researchers are not trained well enough in secondary analysis' (35%), 'data exists but are not accessible' (32%), 'not enough data exists' (27%), while 17% report that 'it is not part of the research culture' (figure 18). Those data accentuate the need for providing training to researchers both in data analysis and preservation.

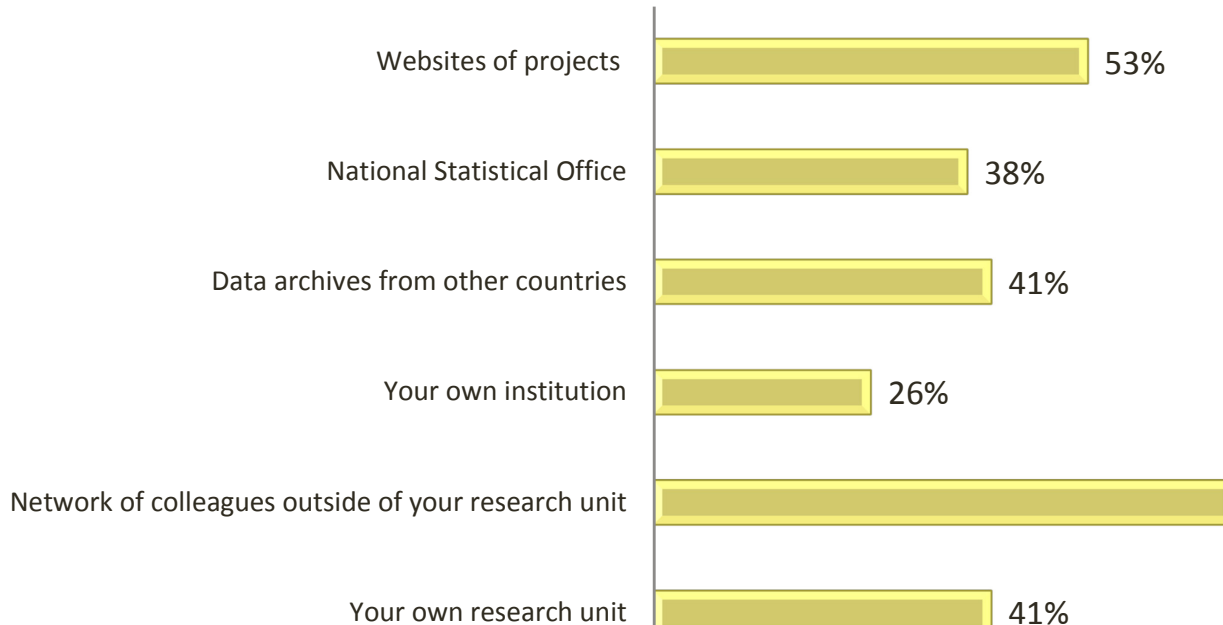
**Figure 18:** Barriers to conducting secondary analysis



Networking is of big importance within current practice regarding data sharing, followed by databases with open or semi-open access (websites of projects). Among given possibilities, researchers stated most frequently having experience in using data provided through networks of colleagues outside their research unit (71%), followed by websites of projects (53%), data archives from other countries (41%) and their own research units (41%), while 38% stated the National Statistical office, and 26% their own institution (figure 19). It is indicative that research unit, research institutions and national statistical office are less of a common source of data, which could be a result of a small scientific community but also lack of a national archive for secondary data, as well as a lack of training in archiving data.

**Figure 19:** Sources of data produced by others

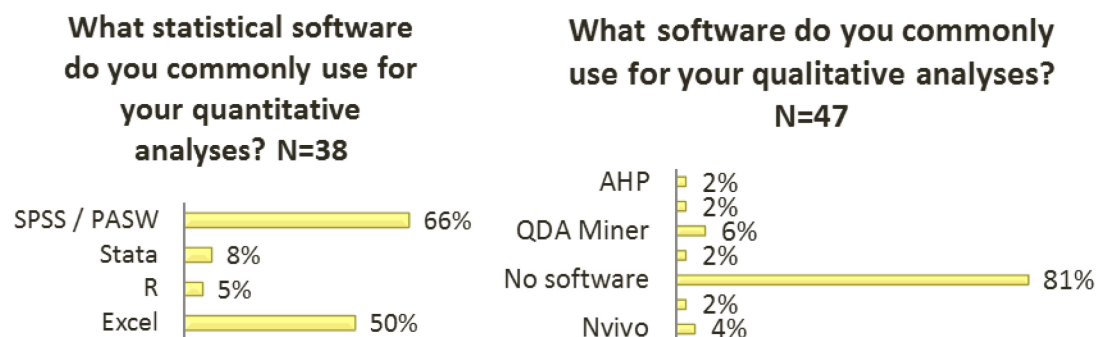
**There are different ways to obtain research data produced by others.  
Please indicate all the sources that you ever used successfully to obtain  
such data. N=34**



In order to collect some information regarding the data produced by Montenegrin scientists, the question of which software used when analysing data was asked. Within this sample 38 people (60%) were involved in quantitative analyses, out of which 66% are using SPSS/PASW and 50% are using Excel (figure 20). A small number of researchers are using Stata (8%) or R (5%).

More people in this sample are using qualitative than quantitative analyses. Data from qualitative analyses were produced by 47 researchers in the sample, or 75%. The most common is absence of any software in analyzing qualitative data, which is reported by 81% researchers who are a part of the sample and implementing qualitative analysis. There are rare cases of researchers using any of the following softwares: QDA Miner (6%), NVivo (4%), AHP (2%), RQDA (2%), CAT (2%) (figure 20).

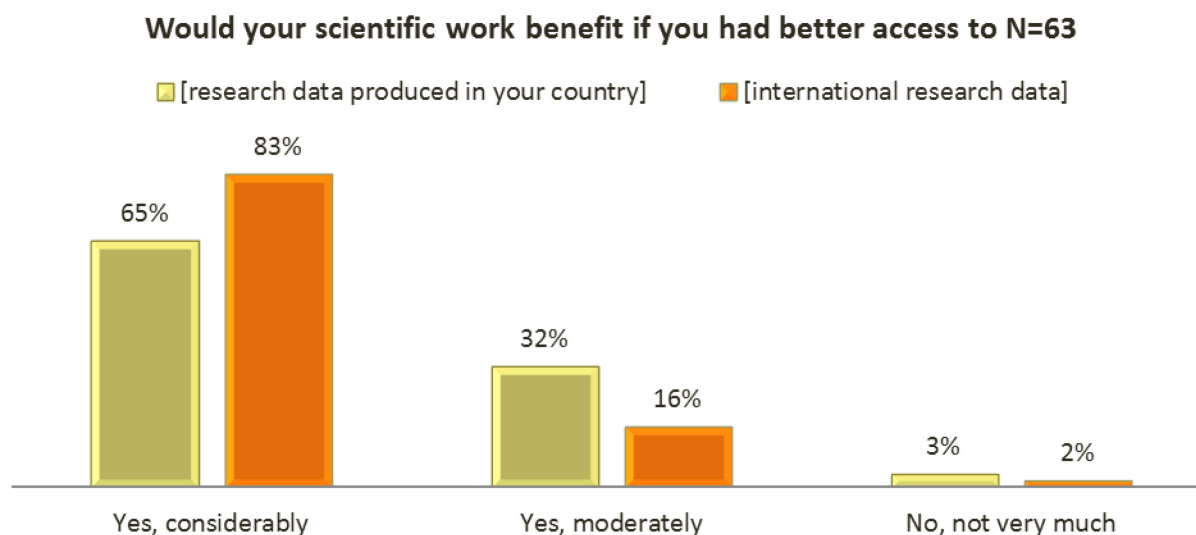
**Figure 20 and 21:** Software used for conducting quantitative and qualitative data analysis



#### 4.8 Attitudes towards data sharing and existence of national data archive

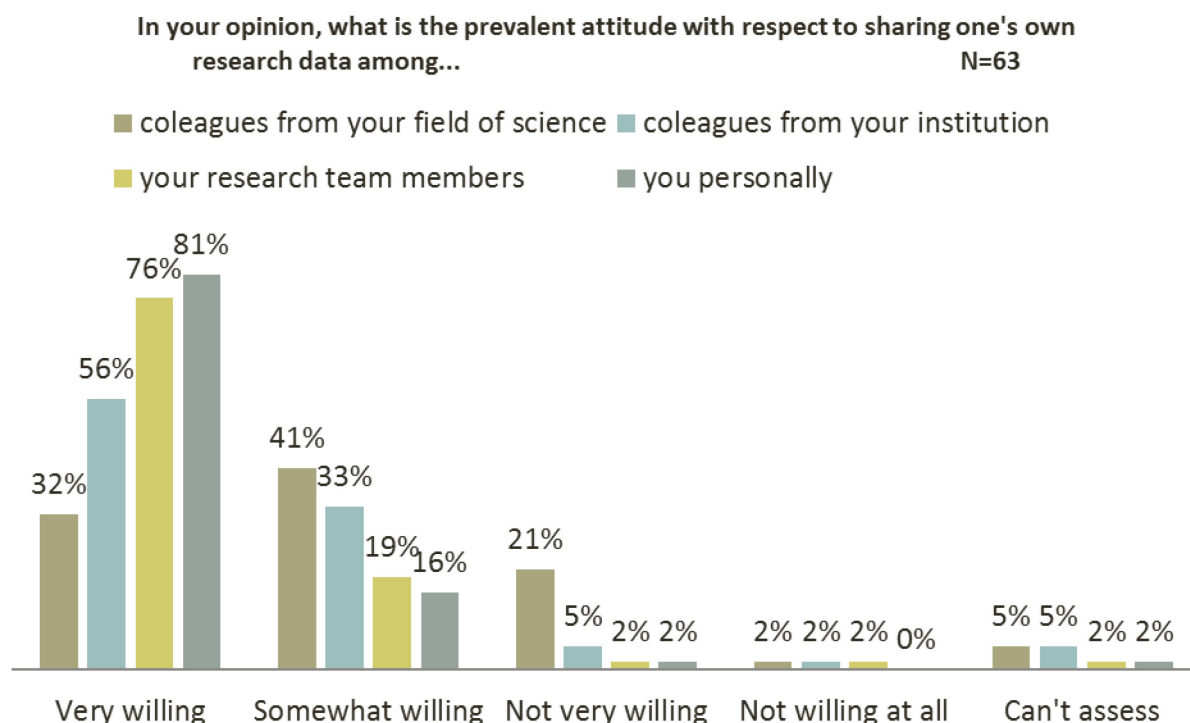
Almost all researchers are aware that their work would benefit from access to data of other researchers, at least moderately (figure 22). Most of the researchers share the opinion that their scientific work would benefit considerably both from research data produced in their country (65%) and international research data (83%).

**Figure 22:** Assessment of the potential benefit of better access to data



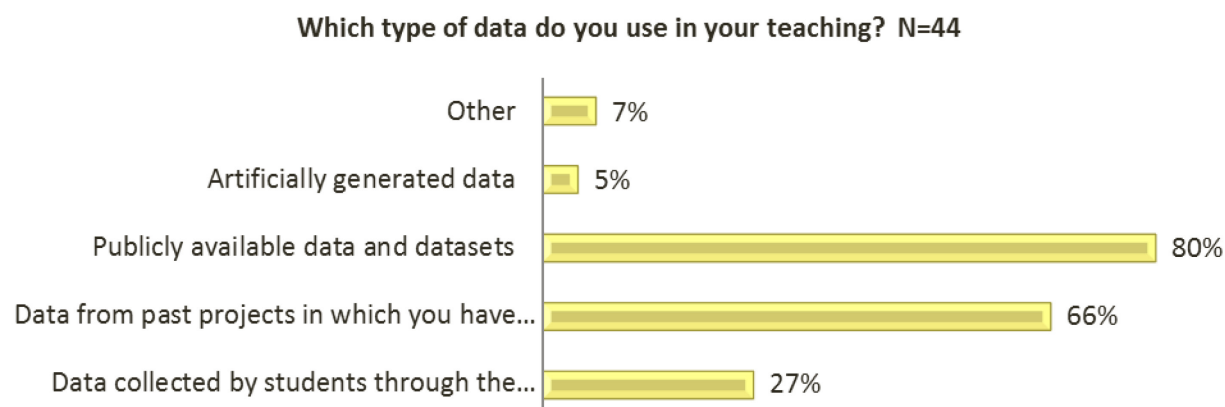
Interesting data are collected related to the opinion of respondents on the prevalent attitude with respect to sharing one's own research data. All respondents answered this question, and it is obvious that on average, the closer the relation is, the more openness there is for sharing. 81% of respondents stated being very willing to share data, which is an impressive result and provides additional argument for introduction of data archiving, especially when paired with common opinion that researchers would benefit from data of other colleagues. A few respondents commented that there is a lack of trust among researchers, question of academic propriety is a relevant one, ethics of research could be jeopardized, and concerns arise in relation to possibility of data being misused.

**Figure 23:** Assessment of willingness to share data



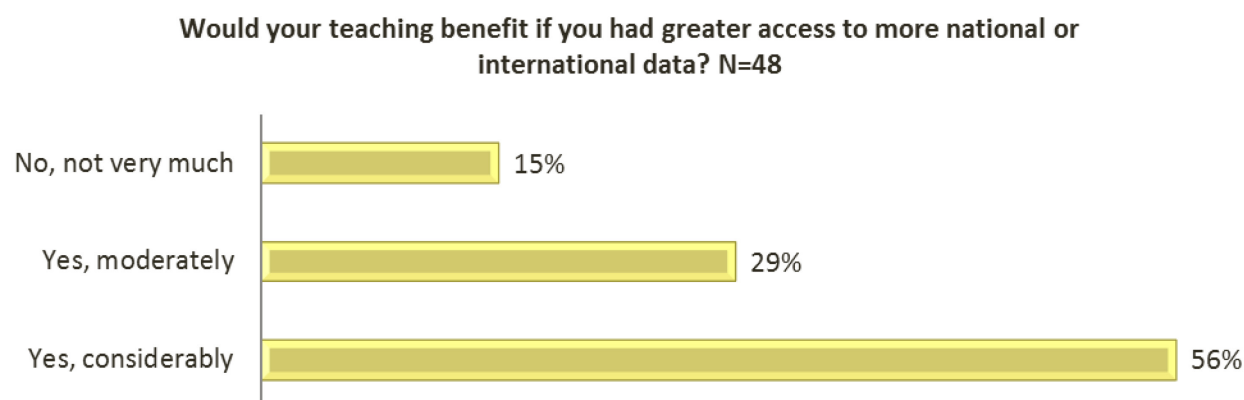
Access to data is valuable also when taking into consideration that 76% of respondents have teaching responsibilities. In the context of their academic work, 77% of them analyse or discuss research data regularly or sometimes (N=48). Out of the number related to the last group, 44 have indicated which data are used in their teaching and most frequently these are: **Publicly available data and datasets** (80%), Data from past projects that they have participated in (66%), while 27% indicated data collected by students through coursework (figure 24). Rarely, teachers are using artificially created datasets. Again, these results show that the existence of a national data archive could be an additional benefit for academic institutions and students.

**Figure 24:** Data usage in teaching



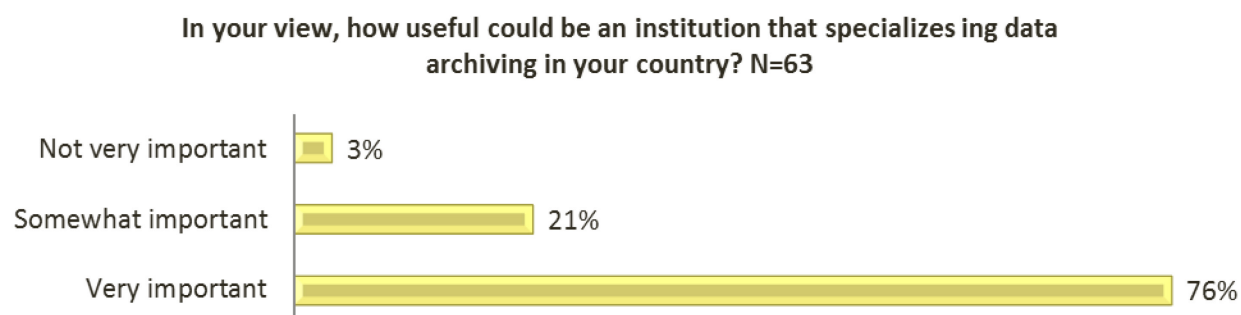
The previous statement is recognised also in the opinion of the researchers involved in teaching that their work with students would benefit considerably (56%) or moderately (29%) from more access to national or international data (figure 25).

**Figure 25:** Assessment of benefit of accessing data produced by other in teaching



Finally, a strong majority, 76% holds the opinion that it would be very important to have an institution specialised in data archiving in Montenegro (figure 26).

**Figure 26:** Assessment of usefulness of introducing an institution specialized in data archiving in Montenegro.



#### ***4.9 Comments and remarks from researchers***

Researchers provided additional comments related to social science studies and attitude of researchers towards data archiving, sharing, in Montenegro or the likelihood of success of a national data archive at the service of researchers. Comments were provided by 11 respondents and are classified in 4 groups and summerized.

- **Scientific research in Montenegro suffers from many obstacles, barriers and shortcomings**
- Social science community in Montenegro is facing with lot of obstacles, and reserchers have mentions some of them, such as: lack of support by insitutions, lack of relevant and available data, lack of use of modern research methods, obstacles in the data collection, ect. **Researchers' working conditions need to be improved.** Research community also suffers from the lack of the access to the important scientific databases, scientific journals.



There was a suggestion that scientific research community as such has to be institutionalized.

- **Business and academic (science) sectors should be better connected**

1. There is a need for raising awareness of the business community of the importance of the research itself, of the information exchange and of the networking of the business and the scientific community.

- **More clear standards need to be introduced in the scientific research in Montenegro**

1. Standards have to be introduced in data collection, analyzing, archiving and presenting.
2. Researchers need additional trainings in methodology of data collecting and processing, on secondary data keeping, using and on data privacy protection. There is a need of the unified, synchronized, harmonized system of official statistics.

3.

- **Montenegro needs national data archive, but certain conditions has to be satisfied**

4. National data archive would be very valuable for researchers.
5. The purpose of the archives has to be clear. Special attention should be paid to data protection, keeping and archiving.
6. A Montenegrin data archive has to be compatible with those that are used in countries that are leaders in social sciences research.
7. Access to international data has to be granted to Montenegrin researchers.

### **Recommendations regarding results of conducted quantitative survey:**

Montenegro should have centralized National secondary data archive.

Montenegrin researchers in the social science need to have better access to scientific databases.

This finding indicates the need for a broader discussion on data keeping, preparing, protecting, archiving and accessing, among the scientific community in Montenegro.

Awareness has to be raised of the importance and benefits of data archiving and sharing with other researchers.

National standards and procedures which would be in international compliance regarding data collecting, keeping, preparing, protecting, archiving and accessing should be introduced in academic institutions.

Those standards and procedures should be an integral part of the call for proposals for public fundings.

Montenegrin researchers need better training in methodology, tools and international standards of data collection, processing, keeping, and archiving.

More funding has to be available for research in social science, especially as Montenegro lacks data.

Research institutions, academic institutions, think tanks, NGOs that are producing scientific data, should establish closer cooperation between themselves and with national statistical office in process of data collecting, analyzing, archiving and sharing.

Research community has to face with lack of trust among researchers, question of academic propriety, and concerns in relation to possibility of data being misused.

Researchers' working conditions need to be improved.

## **5. Interviews with stakeholders**

Besides conducting a detailed analysis of the legal and institutional framework, the research team conducted interviews with institutions dealing with the development and the quality of scientific areas, and the design and implementation of scientific policies. Through interviews, issues relevant for setting the foundation for establishing adequate and permanently sustainable infrastructure for a social science data archive were discussed. Topics announced for discussion included analysis of the need for such activity, existing policies on science infrastructure and the legal framework, as well as possible institutional solutions for the services to be shaped within this project.

A conclusion of the conducted interviews implies that it is very important, but also not so simply to establish a permanent data-base that would be used by all researchers from the country for archiving raw data. Instead, at this moment, this is possible for concrete research results only. Also, there are no separated systems for data archiving in the field of social sciences. Raw data, data that have not been processed or analysed, are not being archived. On the other hand, while financing scientific research projects, there are no requirements by funders or executors regarding archiving data obtained through that particular research. Even though all publications are being archived in the Central Library, raw data, i.e. data collected in specific research projects that are recorded in matching readable format and used for analytic purposes, such as survey data, interviews in sound files, video footage, notes, images, are not being archived.

Decision-makers that were interviewed (12 institutions and 16 persons) stated that they had never met with requirements of research institutes regarding archiving these data. The Ministry of Science does not plan to give funds for this purpose, because they have a "perfectly stable system" when it comes to archiving primary data. Also, interviewers have a negative opinion regarding the idea of defining concrete mechanisms of data archiving in the social sciences, because they consider that this issue cannot be solved by separating sciences. That is, they consider that social sciences should not be a particular category separated from natural sciences.<sup>8</sup> Also, within ESFRI (European Strategy Forum on Research Infrastructures), Montenegro met no requirements regarding this issue. The Central National Library, as well as university libraries, do not have the software or system through which people can electronically access the data. As one of the key reasons, representatives of the Ministry of Science have stated that there were published more than 1,600 studies in all fields of science since 1970, with financial support of the Ministry.

## **6. Recommendations**

According to the key analysis of the legal and institutional framework, as well as key conclusions obtained from conducted interviews with stakeholders, the project team defined the following recommendations:

1. Make sure that research data archiving is well recognised in relevant legal documents. Amend the Law on Archival Activity in order to recognise research data archiving, i.e. archiving of so-called "raw" data. The content of research data should be subject to the Law on Copyright and Related Rights. In line with this, it will be necessary to regulate the access to data based on consent of the author (owner) of the data.

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<sup>8</sup> As representatives of the Ministry of Sciences explained, the Law defines areas of sciences, in accordance with the FRASCATI.

2. Establish closer contacts with national bodies for creating an educational, scientific and technological strategy. Make sure that data archiving is well recognised in relevant policy documents.
3. Continue to explore options for establishing a social science data archive. At this stage of the project, it seems like a future data archive in Montenegro should be organised on a national level.
4. Build cooperation with all relevant higher education and research institutions in Montenegro towards building a network of people who will work closely with researchers employed at these institutions. Members of this network could provide local support to scientists, facilitate data archiving and data sharing, and serve as mediators between the central data archive and local institutions.

## **7. Annexes**

### ***Annex 1. List of interviews***

Initial contacts with institutions dealing with the design and implementation of scientific policies, financing scientific areas and in general, dealing with development and quality of scientific areas were made in June 2015.

In the letter sent to the above-mentioned institutions the project SEEDS was presented, as well as issues that the project covers, specific objectives to be accomplished by the project, and the manner of accomplishing those objectives. The institutions were asked for an interview in order to discuss issues relevant for successful carrying out of the project objectives as well as for setting the foundation for establishing adequate and permanently sustainable infrastructure for a social science data archive. Topics announced for discussion included analysis of the needs for such activity, existing policies on science infrastructure and legal framework, as well as possible institutional solutions for the services to be shaped within this project.

The following institutions were contacted:

- *Ministry of Science*
- *Ministry for Information Society and Telecommunications*
- *INVO HERIC*
- *Ministry of Education*
- *University of Montenegro*
- *Center of Information System of the University of Montenegro*
- *Rectorate of the University of Montenegro*
- *University of Donja Gorica*
- *Montenegrin Academy of Sciences and Arts*
- *Council for Scientific Research Activity*
- *Library of the University of Montenegro*
- *Library of University of Donja Gorica*

## ***Annex 2. Questionnaires***

### **Questionnaire 1. Key stakeholders**

#### **Project: South-Eastern European Data Services – SEEDS**

Center for monitoring and research CeMI is implementing the international project South-Eastern European Data Services – SEEDS, coordinated by Swiss national centre of expertise in the social sciences, with expert support of Consortium of European Social Science Data Archives. The project is implemented in four Western Balkans countries: Montenegro, Albania, Kosovo and Macedonia.

The aim of this project is to establish permanent infrastructure for archiving data obtained from researches within the social sciences in countries in which this project is implemented (Montenegro, Kosovo, Albania and Macedonia), as well as enabling secondary analysis of data produced by other researchers.

In this questionnaire, we are particularly interested in your research practices and needs related to collecting empirical data, their preservation and use for secondary analysis.

(For this survey, the term "data" refers to raw data, that is, information collected in specific research projects that is recorded in matching readable format and used for analytic purposes. This could be survey data, interviews in sound files, video footage, notes, images, etc. By "data", we do not mean analyses, descriptions, statistics, facts, or conclusions that appear in reports, papers, websites, or scientific publications.)

#### **Questions**

1. Does your institution have official policy or relevant document regulating permanent archiving of data obtained through researches within social sciences?
2. Can you describe that policy or document?
3. Is there a policy regarding open access to results of research within social sciences?
4. Considering the fact that Montenegro is associated member of European Strategy Forum on Research Infrastructures, can you give us information on Montenegro's experience regarding this issue?
5. Are there any requirements regarding research data when it comes to funding projects or other activities?
6. Have you met the need of archiving data obtained through researches within social sciences?
7. Have you met requirements of research institutes and institutions regarding research data archiving aimed at their preservation and further analysis in future researches?
8. What is your vision of institutional framework for data archiving within institutions dealing with social sciences? Do you prefer centralized or decentralized model?
9. What are sources for funding activities related to collection, dissemination and preservation of research data? Do you plan to fund these activities?

#### **National data archive**

10. To what extent are data obtained through research within social sciences permanently preserved in Montenegro?
11. Can you make an estimation of percentage of data lost in Montenegro due to lack of permanent perservation in secure environment?
12. In your opinion, is it useful and to what extent to establish a national data archive in Montenegro?
13. Can you tell us about your vision of that archive, about its functions and services, structure and relations with other relevant institutions?
14. Are there national data archives within other sciences in Montenegro?
15. What would be the optimal funding model for national data archive?
16. Can you tell us more about plans of your institution in this area?

Research team of CeMI

## **Questionnaire 2. Libraries, Montenegrin Academy of Sciencies and Arts**

### **Project: Servisi South-Eastern European Data Services – SEEDS**

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### **Questions**

#### **Relevant documents**

1. Does your institution have official policy or relevant dcument regulating permanent archiving of data obtained through researches within social sciences?
2. Can you describe that policy or document?

### **Existing infrastructure and data archiving capacities**

3. Does your institution preserve data obtained through researches?

4. Does your institution preserve and disseminate data from

Social sciences;

Humanities or

Other.

### **Data preservation**

5. Can you describe the process of data preservation within your institution?

6. Are data preserved within your institution safe and to what extent – are data preserved in protected servers? Are there backups or formal procedures regarding data protection?

7. Are data preserved in a manner that ensures that they are accessible in next 20 or 50 years? (i.e. they are preserved with following descriptive documentation in format that doesn't require licensed software)

### **Documenting data and standards**

8. Does your institution use any standard for documenting research data, such as DDI, Dublin Core?

9. Does your institution comply with basic standards for ensuring validity of digital archives, such as OAIS or Data Seal of Approval?

9. Does your institution participate in any international project that requires harmonizing groups of data from different countries in order to enable their comparison?

10. Does your institution make use of any thesaurus to translate and/or index your data?

11. Does your institution have any experience with particular data service tools for the social sciences, such as NESSTAR, FEDORA or Dataverse? (*If yes:*) Could you briefly describe the purpose for which you use these and your experiences of using them?

### **Accessibility and dissemination of data**

12. Does your institution allow access to the research data that it preserves?

13. Who is allowed to have access to the data? (*Explore if respondent answers researchers, whether this includes researchers in their own organization only or also in other organisations*)

14. What are the conditions that must be met to access these data?

15. Do you have some kind of authentication system that identifies who is eligible to access the data?

16. Are all of the data equally accessible? That is, are there some data that are more accessible than others?

17. By what means does your institution disseminate its research data? For example, are the data sent out on CDs, or are they available on screen, or can they be downloaded from a website?

18. Does your institution have a data catalogue that allows people to find the data that they are looking for? *(If yes:)* Is the catalogue visible outside of your institution, and what software is used to enable this?

19. Does your institution use any legal agreements for storing, disseminating, and/or using research data? This might be in the form of deposit contracts or end-user licenses. *(If yes:)* Could you give a brief description of these legal agreements? *(Also, ask if they could send them to us by e-mail.)*

20. Do the intellectual property rights remain with the researcher/data producer, or are they transferred to your institution?

21. Does your institution receive any external funding for archiving/data service activities? *(If no:)* How is the work of data preservation and dissemination paid for at your institution? *(If yes, ask how much, whether the income is constant and whether it is dedicated to particular activities, e.g., preservation, dissemination, user support).*

22. In your view, would your institution do more to preserve and disseminate research data if it had more resources?

### **Staff capacities**

23. Does your institution have dedicated staff for the preservation and dissemination of research data? *(If yes:)* How many?

24. Do these staff members have specific training in data preservation and dissemination? *(If yes:)* Please explain.

25. What type of additional training does your staff require in order to obtain adequate knowledges reagrding standards and practices related to this issue?

26. Has your staff worked with following software:

1. SAS
2. SPSS
3. STATA
4. R
5. MATLAB
6. Excel
7. Other

Research team of CeMI

### Questionnaire 3. Researchers

First, we would like to get some information about you.

- What is your current **principal** activity? (*select only one*)
  - a. student
  - b. research assistant / doctoral student
  - c. researcher / professor
  - d. project leader
  - e. head of institution
  - f. other (specify) \_\_\_\_\_
  
- With what type of institution are you currently principally affiliated? (*select only one*)
  - a. university
  - b. public research institute
  - c. private research institute/company
  - d. NGO/Think Tank organization
  - e. other (specify)\_\_\_\_\_
  
- Do you work in public, private or NGO sector?
  - a. public
  - b. private
  - c. NGO
  
- What is your principal research discipline? (*select only one*)
  - Anthropology
  - Sociology
  - Psychology
  - Education science
  - Political science
  - Economics
  - Social policy



Communication science and media

Social and economic history

Law

Administrative and management sciences

History

Other (specify) \_\_\_\_\_

- What country are you working in? (*select only one*)
  - a. Albania
  - b. Kosovo
  - c. Macedonia
  - d. Montenegro

### Your research

- In the context of your research activity within the past 5 years, did you produce or help to produce any research data? This could be quantitative and/or qualitative data.
  - a. yes
  - b. no
  - c.
- During the past 5 years, approximately how many datasets did you produce or help to produce?

number of datasets \_\_\_\_\_

The following questions are about your **most recent** research effort **which involved data collection**:

- In which year was the fieldwork (or data collection phase) completed?

year \_\_\_\_\_

- Which data collection method was applied in this research? (e.g. online questionnaire, structured interview, focus groups, experiment, ...)

*If research involved data collection through application of several methods, list all of them, separated by;*

- What was the approximate scope of raw data collected in this research? (*for example: 8000 respondents; or 15 focus groups; or 50 firms; or 700 case reports; or 500 newspaper articles; or 200 hrs of video footage*)

- How was this research financed?

- Research agency/ministry
- International funding/project
- Own funding
- Private sector
- Other (specify)\_\_\_\_\_

- How many researchers were involved in this research project (*not counting yourself*)? \_\_\_\_

## Data preservation

- After you completed **your last research project**, did you or your research team members save the data?

- yes
- no

- What kind of data was kept from your last project? (*multiple choice*)

- raw data
- cleaned data (coded, anonymised, ..)
- prepared for analysis (with transformations, with created indexes, recoded)
- well documented with metadata
- don't know

- Did you use any special documentation/metadata standard for description of your research/data?

- a. DDI
  - b. DC
  - c. ISO 11179
  - d. Internal documentation standard
  - e. don't know
  - f. other (specify)\_\_\_\_\_
- Where is the data from your last project kept? (*multiple choice*)
  - a. on my computer
  - b. on my colleague's computer
  - c. several copies on different computers and/or different media
  - d. server at my local institution/university
  - e. data archive/repository
  - f. don't know
- Who may be granted access to the data from your last project for research use? (*last level is most inclusive*)
  - a. just the project leader
  - b. team members
  - c. members of my institution
  - d. broader scientific community
  - e. publicly available (open access)
  - f. other (specify)\_\_\_\_\_
- In your opinion, what would be the ideal level of access to these data?
  - a. just the project leader
  - b. team members only
  - c. members of my institution only
  - d. broader scientific community only
  - e. publicly available (open access)
  - f. I do not know
  - g. other (specify)
- If you knew that your data would be preserved for the long-term in a secure environment, and shared only with accredited researchers, would you be willing to provide your data to a social science data archive? (*select one*)
  - a. Yes, certainly
  - b. Yes, probably
  - c. Not sure

- d. No, probably not
- e. No, certainly not

### Data sharing and secondary analysis

Now we would like to ask you several questions regarding the sharing of data. By this we mean allowing researchers to access and use data that they themselves did not produce. Secondary analysis is defined as analysis of data that were produced by others, where one was not involved in the original research.

- With respect to **your own discipline**, how important is the sharing of research data? (*select one*)
  - a. very important
  - b. somewhat important
  - c. not very important
  - d. not at all important
  - e. no opinion
- Do you know if any other researcher outside your own team used any of the research data that you produced for secondary analysis **during the past year**?
  - a. No one outside my team has ever used research data that we produced
  - b. Yes, but it was over a year ago
  - c. Yes, and it was less than a year ago
  - d. I am not sure
- How often do you analyse quantitative data that were not produced by yourself or your research team? (*select one*)

Year (write number)

Month (write number)

- And how often do you analyse *qualitative* data that were not produced by yourself or your research team? (*select one*)

Year (write number)

Month (write number)

- In general, what are the barriers to conducting secondary analysis in your country? (*check all that apply*)
  - a. not enough relevant data exist
  - b. data exist but are not accessible
  - c. data exist and are accessible, but are poorly documented and unusable
  - d. researchers are not well enough trained in secondary analysis
  - e. it is not part of the research culture
  - f. I do not know
  - g. other (specify)\_\_\_\_\_
  
- What statistical software program(s) do you use most often for your quantitative analyses?
  - a. I have never used quantitative analysis
  - b. Excel
  - c. R
  - d. SAS
  - e. STATA
  - f. SPSS/PASW
  - g. other (specify)\_\_\_\_\_
  
- What software program(s) do you use most often for your qualitative analyses? (*select one*)
  - a. I have never use qualitative analysis
  - b. I do not use software for qualitative analysis
  - c. Atlas.ti
  - d. Nvivo
  - e. MAXQDA
  - f. QDA Miner
  - g. CAT
  - h. RQDA
  - i. Dedoose
  - j. Other (specify)
  
- Would your research benefit if you had greater access to more data produced in your country? (*select one*)
  - a. Yes, certainly
  - b. Yes, probably
  - c. No, not very much

- d. No, not at all
- Would your research benefit if you had greater access to more international data? (*select one*)
  - a. Yes, certainly
  - b. Yes, probably
  - c. No, not very much
  - d. No, not at all
- Does your professional activity include teaching responsibilities?
  - a. yes
  - b. no
- In the context of your teaching, how often do you analyze or discuss research data? (*select one*)
  - a. regularly
  - b. sometimes
  - c. rarely
  - d. never
- Which type of data do you use in your teaching? (*check all that apply*)
  - a. Data collected by students themselves
  - b. Data from previous projects of your project team
  - c. Publicly available data and datasets (e.g. international)
  - d. Artificially generated data or datasets included with the coursework
  - e. Other (specify)
- Would your *teaching* benefit if you had greater access to more national or international data? (*select one*)
  - a. Yes, certainly
  - b. Yes, probably
  - c. No, not very much
  - d. No, not at all
- In your view, how important/useful could be an institution that specializes in data archiving in your country? (*select one*)

- a. very important
  - b. somewhat important
  - c. not very important
  - d. not at all important
  - e. no opinion
- Please include any comments that you think would be helpful for understanding the social science research community in your country, or the likelihood of success of a national data infrastructure/archive at the service of researchers.

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- If you are interested in archiving of and access to research data in your country, please leave us your name, institutional affiliation, and e-mail address so that we can send you further information about our project.

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*Your contact data will be kept confidential.*

- Can we associate your email address with answers about recent data collections in which you participated (questions Q5-Q10 only)?
  - a. yes
  - b. no

Thank you for your participation!