RESEARCH ON ACCESS AND USE OF GEOGRAPHIC INFORMATION IN THE REPUBLIC OF MOLDOVA

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Abstract: *The development of National Spatial Data Infrastructure in the Republic Moldova has been developed rapidly in recent years thanks to donors, namely Norwegian Government, JICA, European Commission, World Bank and others. This has led to the development and implementation of NSDI law, the development of Geoportal containing metadata, interoperable data and services, GNSS MoldPOS Net, the creation of a stakeholders' working group. The Geographic Information will provide important contributions on both mitigation and adaptation to climate and environmental changes. The Geographical Information will help also in the following ways: geographical information provided by separate government institutions will help with smart climate services, infrastructure and land use planning in key sectors, as well as Disaster Risk Management from climate change. This paper describes the research of current situation in the Republic of Moldova in access and using the geospatial information by stakeholders, and nationally consistent basic spatial data, including orthophoto data and derived digital maps, and deliver spatial information that is up to date. To develop this research, the authors sent a Stakeholder Questionnaire "How does your organization use Geospatial Information?". Furthermore, were interviewed individuals from 43 key organizations users of geospatial information. The individuals were from the central and local public authorities, associations and organizations of professionals, academia and private companies*

Key words: *Geographic Information; Reference Data; Innovation*

1. Introduction

During the last 15 years the donors, namely Norwegian Ministry of Foreign Affairs (NMFA) throw Norwegian Mapping and Cadastre Authority (SK)N, Japan International Cooperation Agency (JICA), European Commission, World Bank and others, is assisting the Government of Moldova in preparation of geographic information as Orthoimagery, Digital Terrain Model, Base Maps, GNSS MoldPOS Net and with solution for distribution of geographic information via Internet https://www.geodata.gov.md/ .

The assistance from donors has significantly contributed to improvements of public services. One major goal of this cooperation is to support Moldova with reference data urgently needed to solve problems connected to property registration, security of tenure, land conflict's resolution, decision making at all levels and good Land Governance.

In April 2012, the Government of Moldova joined the Open Government Partnership initiative where it committed to increase public access to information, promote transparency of governance and ensure citizens' participation to governance, by using advanced

information technologies. One of the tools that ensures Government openness is the open data portal www.date.gov.md, where all government institutions, constantly post data sets. The open data principles are facilitates citizens’ access to the data of the ministries and central public administration.

Although the Government of Moldova, throw the Agency for Geodesy, Cartography and Cadastre (AGCC) has been making special efforts to administer the generation, updating, and distribution of spatial information. The network services, datasets and applications in Moldova are available through the https://www.geodata.gov.md/#/ and http://www.geoportalinds.gov.md/.

2. The needs and opportunities of government in geographic information.

According to the Moldovan law on territorial administrative organization, Moldova is divided administratively into the following administrative territorial units: districts (Romanian: *raioane*; *see also raions*), cities/towns (Romanian: *orașe*) and villages (Romanian: *sate*).

The administrative territorial organization of Moldova is made on 2 levels:

1. Villages (communes), sectors and cities/towns (municipalities) constitute the first level,
2. Districts (Chișinău municipality, Bălți municipality and Bender municipality constitute the second level).

Two or more villages can form together a commune (Romanian: *comună*).

Currently, Moldova is divided into the following first-tier units,[1,2,3,4,5,6.7] which include 32 districts:

1. Anenii Noi
2. Basarabeasca
3. Briceni
4. Cahul
5. Cantemir
6. Călărași
7. Căușeni
8. Cimișlia
9. Criuleni
10. Dondușeni
11. Drochia
12. Dubăsari
13. Edineț
14. Fălești
15. Florești
16. Glodeni
17. Hîncești
18. Ialoveni
19. Leova
20. Nisporeni
21. Ocnița
22. Orhei
23. Rezina
24. Rîșcani
25. Sîngerei
26. Soroca
27. Strășeni
28. Șoldănești
29. Ștefan Vodă
30. Taraclia
31. Telenești
32. Ungheni

three municipalities:

1. Chișinău
2. Bălți
3. Bender

And two *autonomous territorial units*:

1. Gagauzia (officially "Autonomous Territorial Unit Gagauzia")
2. Transnistria (officially "Territorial administrative units from the left part of Nistru river")

The final status of the latter has not been settled yet, as the region, such as defined administratively, in fact is not under the control of Moldovan authorities. The cities of Comrat and Tiraspol also have municipality status, but are not among first-tier units of Moldova; they are the seats of Gagauzia and Transnistria, respectively.[*citation needed*] Besides

Chișinău, Bălți, Bender, Comrat, and Tiraspol, on 13 April 2017 eight more became municipalities: Cahul, Ceadîr-Lunga, Edineț, Hîncești, Orhei, Soroca, Strășeni, and Ungheni.

43 Organizations on different levels of government and private sector were contacted for assessment study. For the agreed contacts, it was investigated if and how the Stakeholders are informed about the availability of the geographic data, are they well informed about ways and terms of access to the data, identify obstacles to accessing and using data. It was collected contacts' opinion on access to the data (prices, delivery services, etc) and on issues that may prevent access to and use of the data (lack of equipment, knowledge, etc.)

For contacts, which have been using the data, the it was investigated i) In what format they have used the data (digital or paper), ii) How data was delivered to the contacts (downloaded, delivered on CD or hardcopy), iii) In case they have received data in digital form, what kind of local GIS system do they have, and iv) What the data actually have been used for, v) If the Stakeholders are satisfied with the quality of the data.

Also the Stakeholders was asked about human resources, i) how many geospatial information work in their organization, ii) Is the number of geospatial information specialists sufficient to meet their organization's needs?, iii) are the available skills for geospatial information management in their organization sufficient to meet their organization's needs, iv) How would they rate the level of staff turnover for geospatial specialists in their organization?

All contacted and interviewed Governments organizations need Geographical Information. Geographical Information required by the central and local public authorities, private industry, academia, nongovernmental organizations, and individual citizens. Paper orthophoto maps and digital forms underpin an increasingly large segment of the Nation's economy. The economic multiplier of freely available public domain geographic data is substantial. Entire industries are built around these data. Base geographic information is considered and supported as part of the Nation's infrastructure. At the same time, the use of Geographical Information has reduced costs and increased efficiencies in a wide variety of areas where it is necessary to manage large networks of geographically dispersed facilities, most notably in the utility industries, transportation, and local governments. The Geographical Information will help also in the following ways: geographical information provided by separate government institutions will help with smart climate services, infrastructure and land use planning in key sectors, as well as Disaster Risk Management from climate change.

The orthophoto maps are the one of mane geospatial data accessible through the https://www.geodata.gov.md/ portal and is the most used by Stakeholders in Moldova. The AGCC role has shifted as well toward coordinating and managing geospatial data and facilitating partnerships among the producers and consumers of geospatial information in government, the private sector, and academia. The challenges to coordinating how geospatial data are acquired and used—collecting duplicative data sets, for example—at the local and central in collaboration with the private sector, are long-standing and not yet resolved. The AGCC has a mandate to provide base topographic information to the users, including the needs of its own scientific programs and those of other organizations. This mission is consistent with the "Coordination of Surveying, Mapping, and Related Spatial Data Activities."

The orthophoto maps, complemented by digital forms of the mapped information and aerial imagery, support numerous government activities, including saving lives and property in natural disasters, aiding other bureaus of the Ministry of the Internal Affairs in carrying out their stewardship and regulatory responsibilities, and providing a cornerstone for other science programs. These spatial data also have been used widely by central and local governments, the private sector, academia and other organizations. Citizens use the

orthophoto maps in educational, recreational, environmental, and conservation activities, and to explore and understand natural resource issues.

Information about location supports a wide range of services and policy decisions in local government. Everything happens somewhere. The characteristics of place and the needs of people, communities and businesses within places vary hugely. For this reason, local government has a particular need for quality geographical information and wants to know its value to local public service delivery and the wider public good. Geographical information provides evidence to shape and deliver services including planning, housing, employment, transport, environmental protection, health and social care, to name a few. Geographical information can be displayed in many ways, but usually as maps or as an address either in hardcopy or online.

Introducing geographical information to service delivery helps organizations to provide more with the same resources. It therefore has a positive effect on the economy. Geographical information can aid deeper knowledge and foster innovative activity. It can contribute to the production of ‘useful’ knowledge. This is crucial within the context of local government where this knowledge can be used to provide more effective and efficient services for citizens. The key areas identified by the research where geospatial information is a force for transformation are:

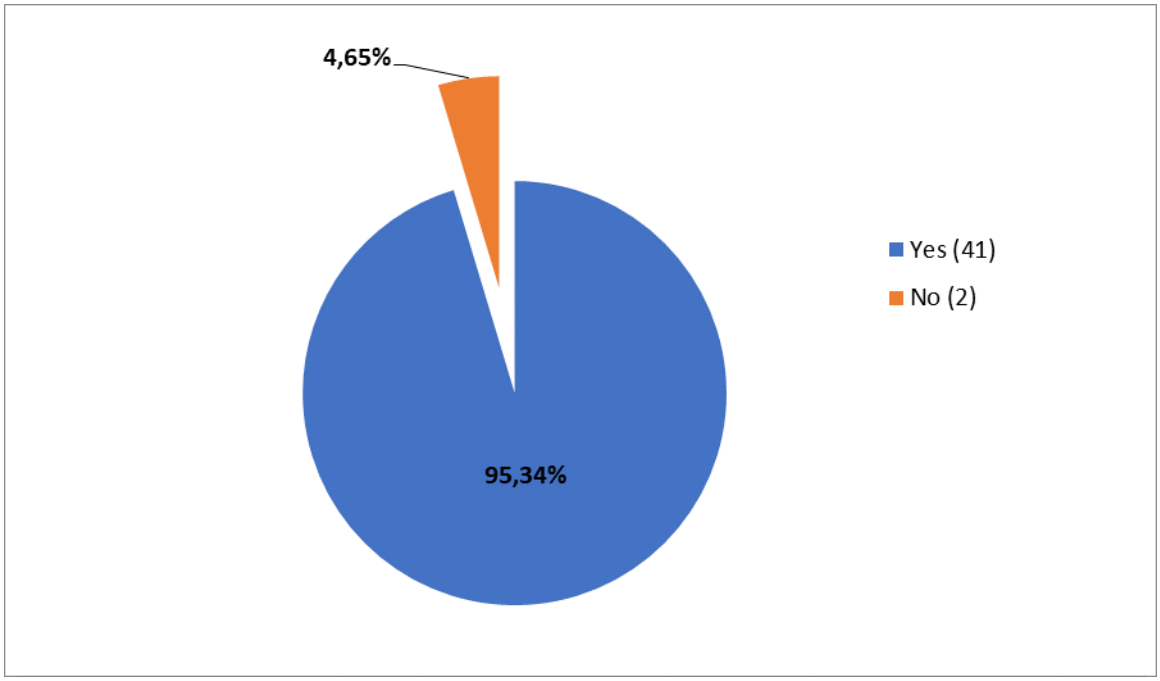
• Better decision making – using geospatially-enabled local information systems and shared intelligence networks provides easy access to quality information and reduces time to find it

• Reduced data duplication – the use of reference datasets reduces costs, errors and facilitates the sharing of services by referring to the same data.

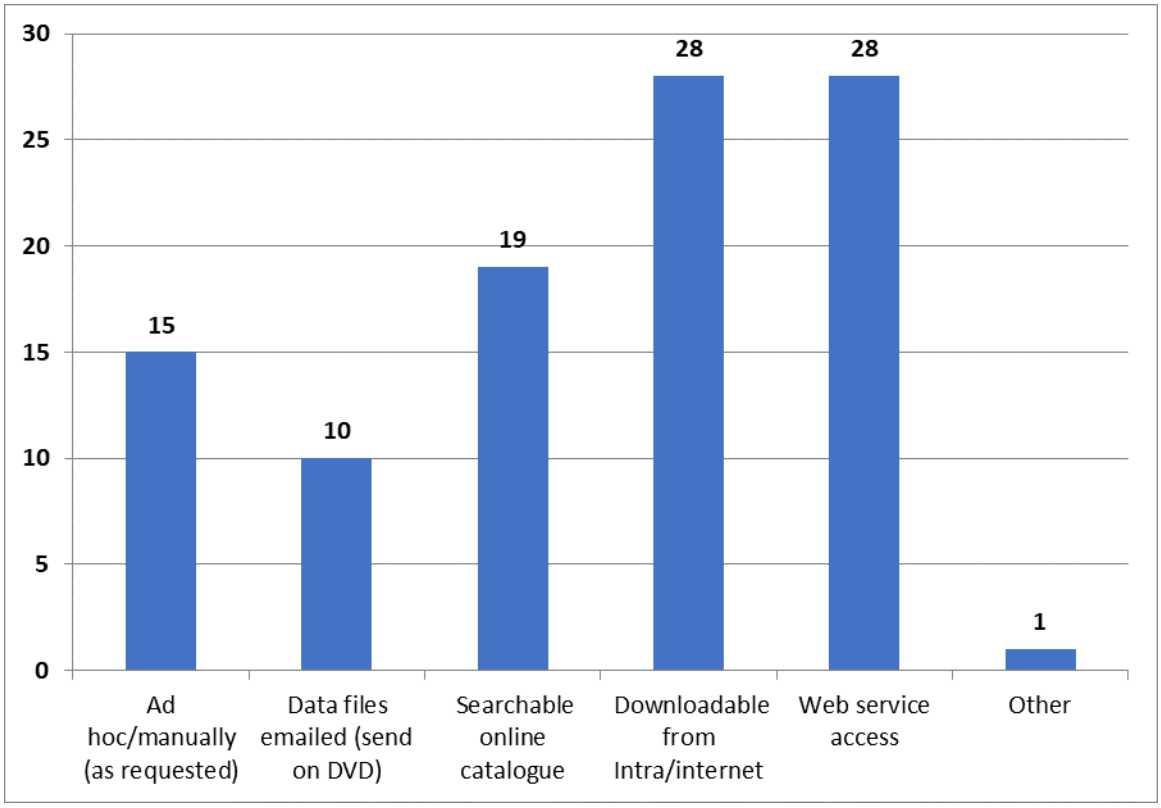
The research on the access and use on geospatial information is included in diagrams shown below.

2.1. Availability of geospatial data

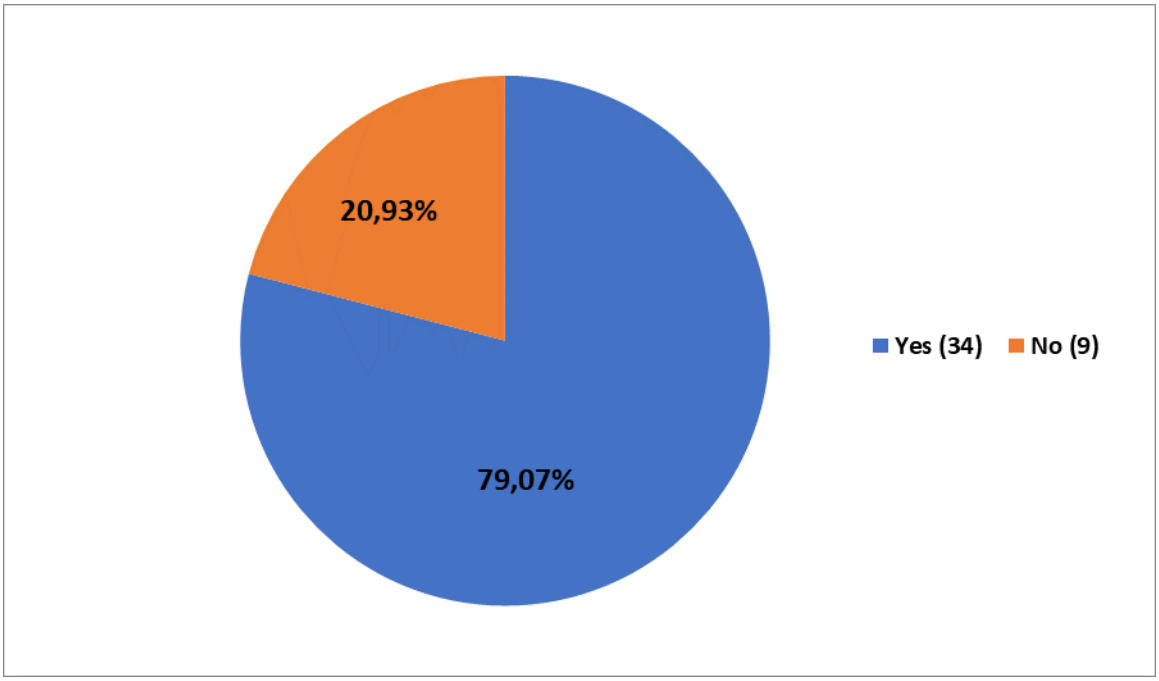
- Are you informed about the availability of geospatial information?



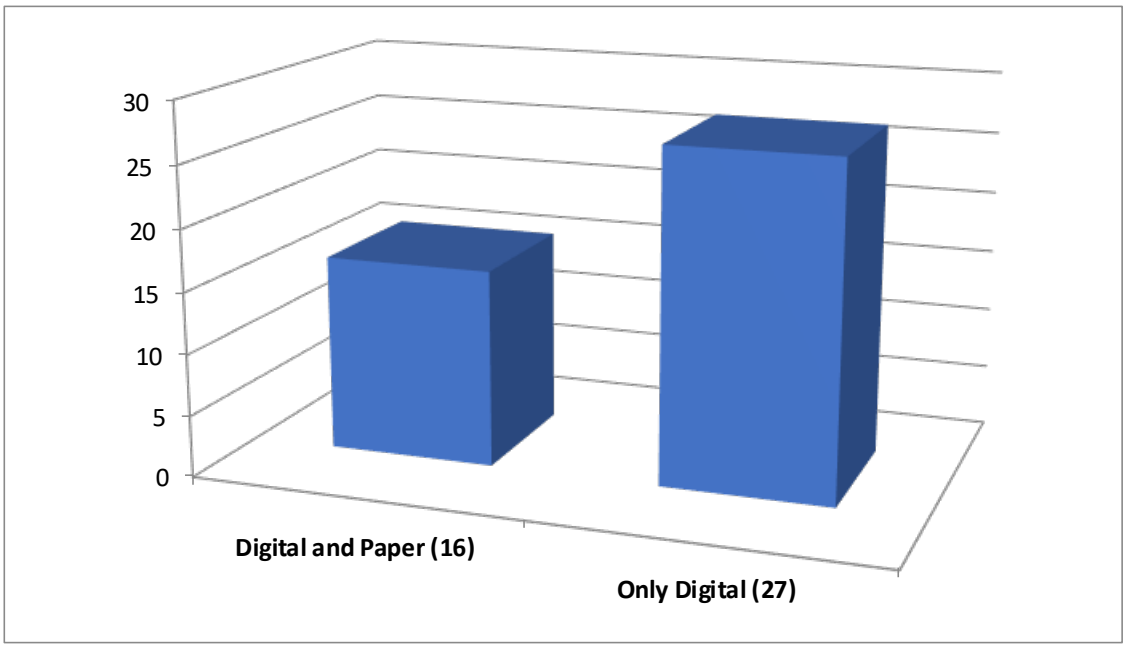
- How are you informed about the availability of geographic information



- Are you well informed about the ways and terms of access to the geographical information? (In brackets – the number of authorities)

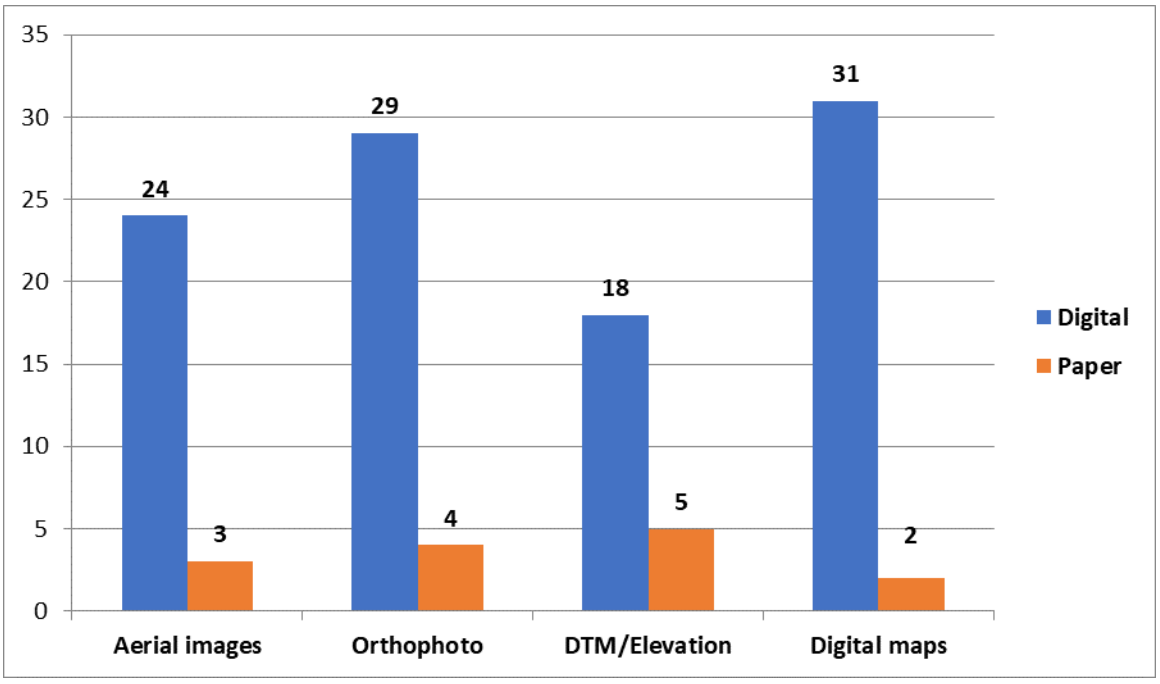


- In what format have you used the geospatial data (In brackets – the number of authorities)

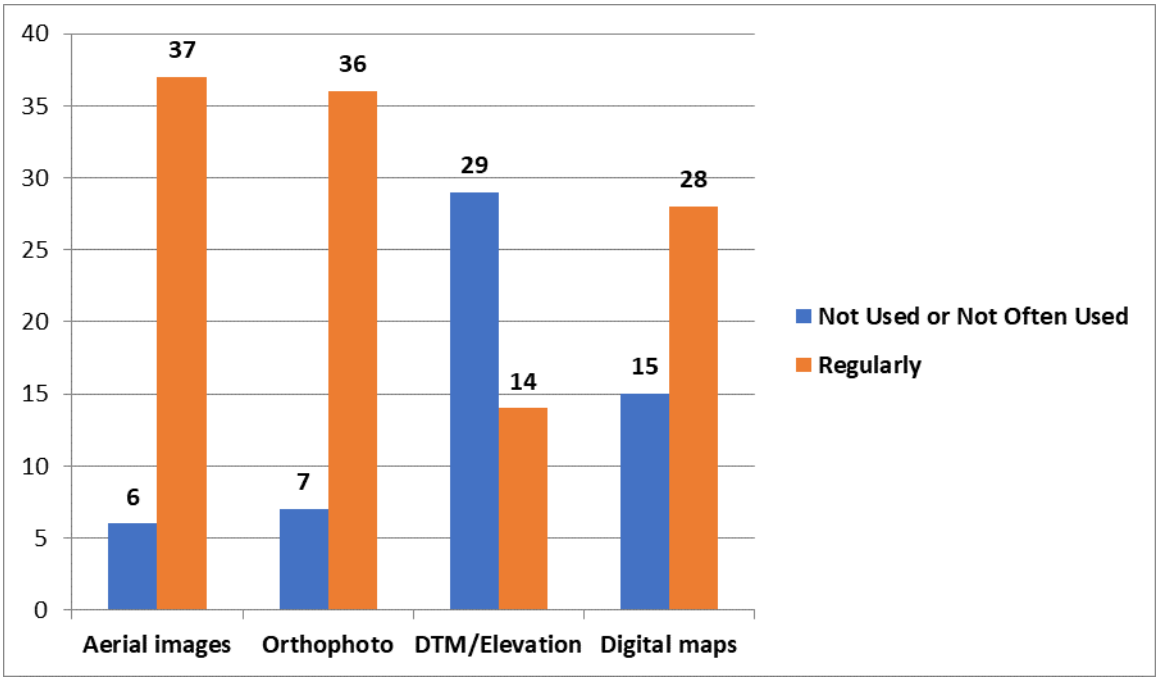


2.2. Geospatial data formats

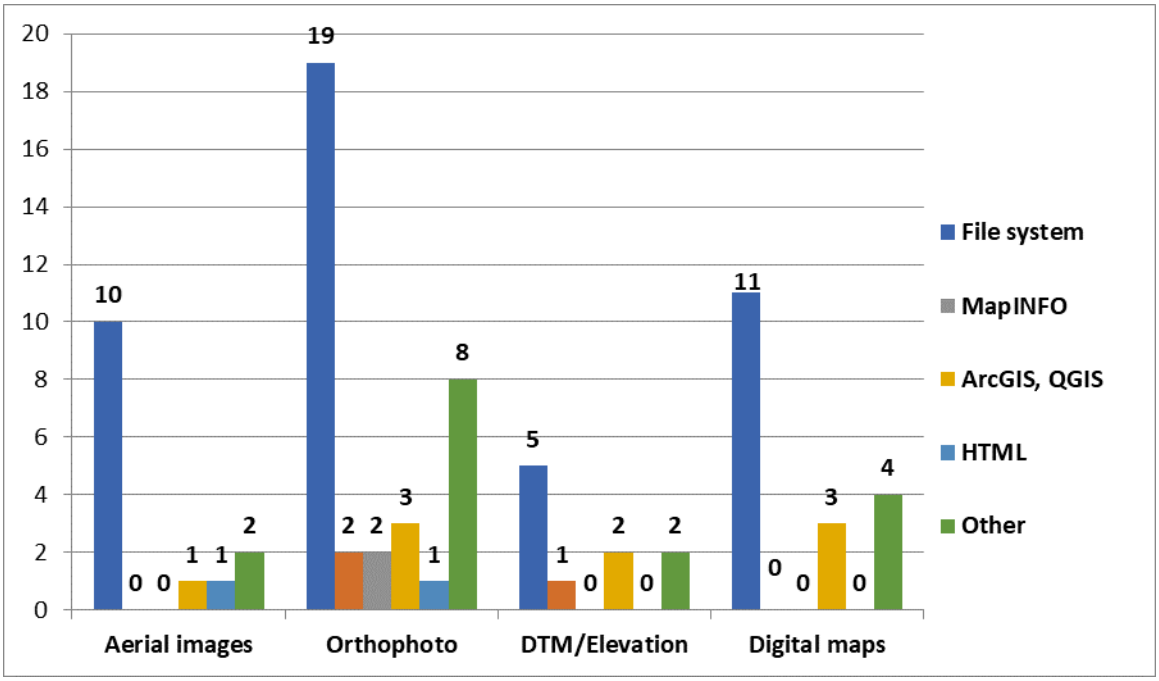
- Storage of data – number of entities



- Frequency of use of the data – number of entities

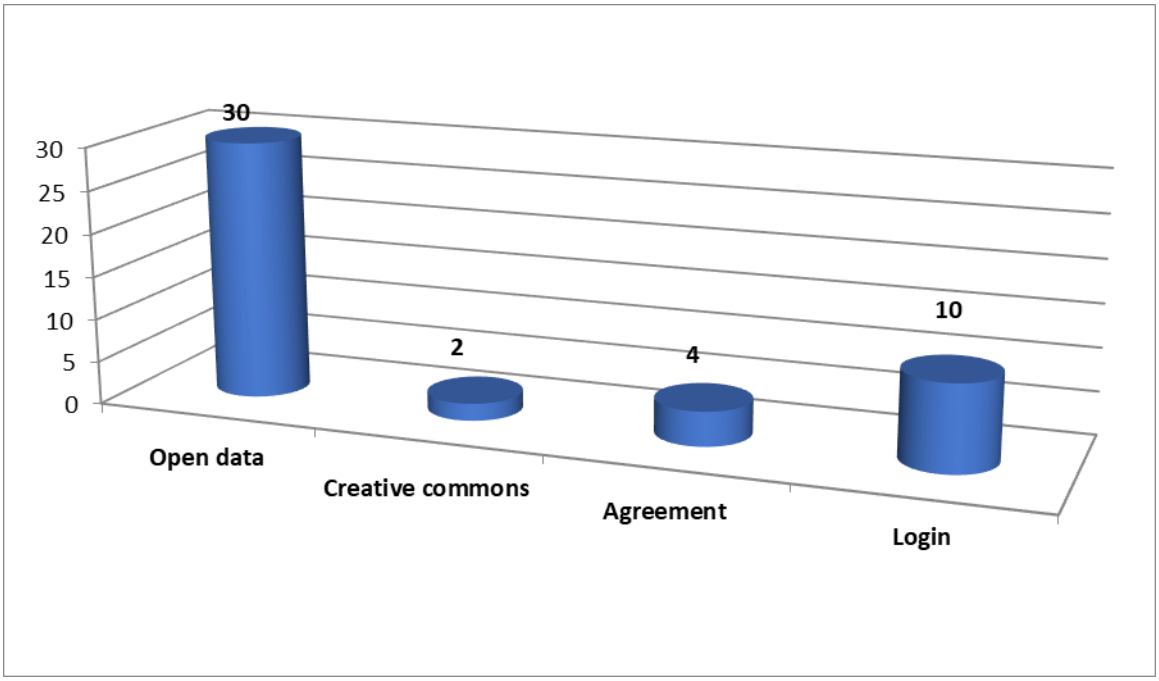


- Database platform used – number of entities



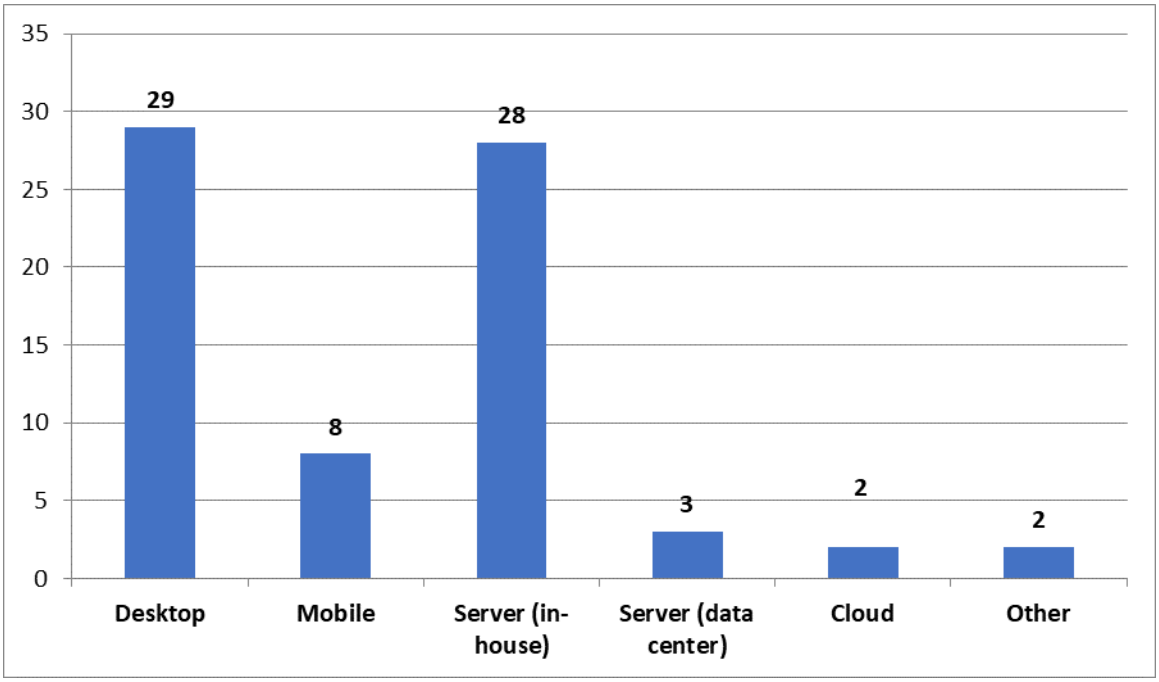
2.3. Geographical information use

- Conditions for accessing the geospatial data

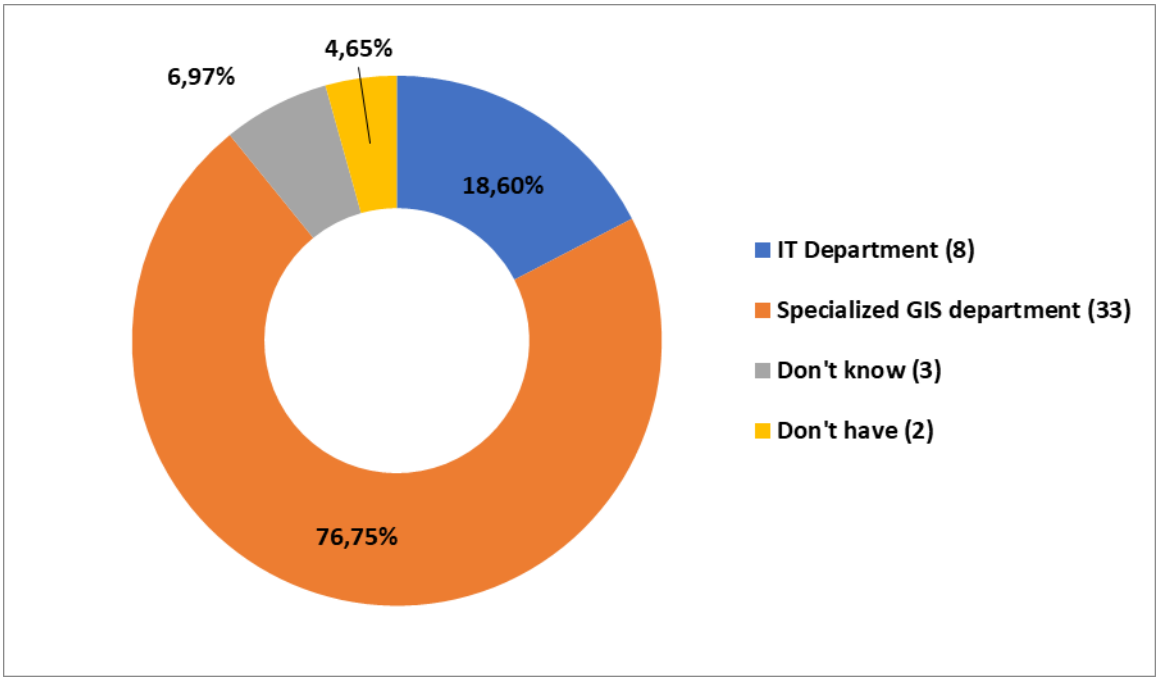


2.4. Technology

- The primary platform for geospatial data and technology

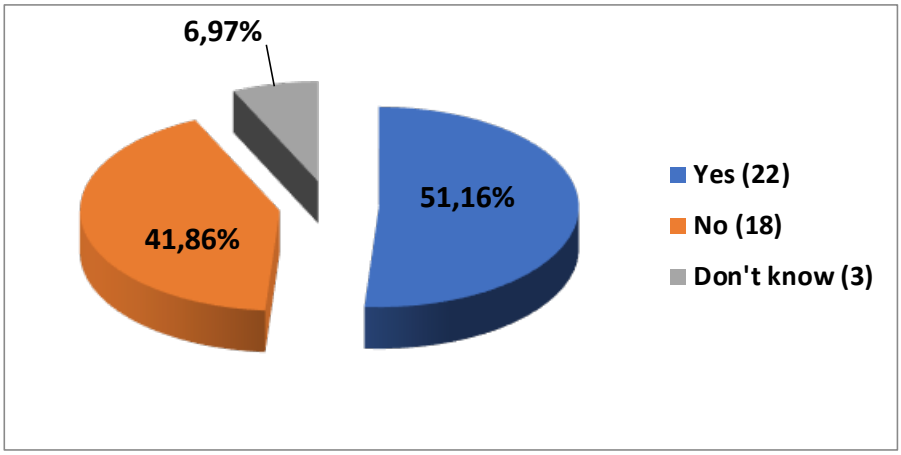


- IT infrastructure and services responsible for the geospatial data in the organizations (In brackets – the number of organizations)



2.5. People

- Is the number of specialists sufficient to meet your organization's needs?



3. Conclusions

Based on the interviews undertaken, it has become clear that the most Stakeholders are well informed about the availability of geospatial information.

There are available the following reference data in Moldova:

- Orthoimagery
- Elevation
- Administrative Units/Boundaries,
- Addresses, Cadastral Parcels, available via the geoportal, password protected. Full national coverage of public and private parcels will be available by the end of WB project;

- Basic Topographic data base 1: 50 000 scale consisting Buildings, Hydrography, Transport Network, Land Cover and Relief;
- National Base Map 1: 5000.

The AGCC throw S.E. INGEOCAD and P.I Cadastru are the lead as the providers of geospatial data of several fundamental datasets such as orthophotos, elevation data, etc. AGCC also provides this data including base maps in different scales, through web-based services, which are extensible used by other agencies.

Due to the lack of funds to purchase licenced software, most of local public authorities have obstacles to access and use geographical information. Human resources are lacking, the development of capacity building and training is crucial for use and management of geospatial data.

4. References

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