



# Land Governance in an Interconnected World

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY  
WASHINGTON DC, MARCH 19-23, 2018



## OPEN DATA AND SPATIAL DATA INFRASTRUCTURE DEVELOPMENT IN MOLDOVA

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**Paper prepared for presentation at the  
“2018 World Bank Conference on Land and Poverty: Land Governance in an  
Interconnected World”  
The World Bank – Washington DC, March 19-23, 2018**

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# Responsible Land Governance: Towards an Evidence Based Approach

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## Abstract

The Republic of Moldova, formerly part of Union of the Soviet Socialist Republics, is independent since August 1991. Moldova is situated in the Southern part of Eastern Europe and covers area of approximately 33 700 km<sup>2</sup>, of which about 62% is agricultural land. To properly manage land use and revitalize the agricultural sector, the Republic of Moldova needs urgently to have updated accurate geospatial information.

During the last 10 years (2006-till now) the Norwegian Ministry of Foreign Affairs (NMFA) through Norwegian Mapping and Cadastre Authority (SK) is assisting the Government of Moldova through Agency for Land Relations and Cadastre (ALRC) in preparation of geographic information (Orthoimagery, Digital Terrain Model and Base Maps) and with solution for distribution of geographic data via Internet <https://www.moldova-map.md/>. The assistance from Norway 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 ensure Government openness is the open data portal [www.date.gov.md](http://www.date.gov.md), where all government institutions, constantly post data sets. The open data principles are facilitating citizens' access to the data of the ministries and central public administration.

Although the Government of Moldova, through ALRC, has been making special efforts to administer the generation, updating, and distribution of spatial information, issues still exist. These include an unclear data sharing policy, redundancy of spatial data, the lack of spatial data for decision support and crisis management, and a relatively low awareness about the use and benefits of spatial information.

The services from the ALRC can be accessed either through a user name and password or through a solution with a web-server giving the user's system a ticket, which ensures safety and counting. The limited number of network services, datasets and applications in Moldova are available through the <http://www.geoportal.md> and <http://www.geoportalinds.gov.md/>.

The main objective of the given report is an analysis of Open Data and NSDI development in Moldova. Special attention is paid to key actors as data users of geospatial information in Moldova, interested central and local public authorities, private sector, research organizations and NGO which benefit from the geospatial information, especially aerial photography, orthophotos, elevation/digital terrain model and base maps.

**Keywords:** Open Data, NSDI, INSPIRE, Geospatial data



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## I. Introduction

The Republic of Moldova is a landlocked country in Eastern Europe located between Romania to the west and Ukraine to the north, east, and south. The history of the Land reform in Moldova started soon after the country became independent from the Soviet Union in 1991. To assist the privatisation and development process of registration of newly formatted property units, the National Agency for Geodesy, Mapping and Cadastre was established in 1994. Since that time a comprehensive legal basis for functional cadastral system has been created in Moldova: the Constitution, the Land Code, and the Law on Real Property Cadastre with the respective legal acts, regulations and instructions. The top institution - The Agency for Land Relations and Cadastre (ALRC), implements a unified policy in the land administration on the national level, coordinates all activities related to the cadastre, and is accountable directly to the Government.

Substantial support from the World Bank and other international donor institutions has resulted in: i) establishing and operating a unified property registration system; ii) about 75% properties are registered; iii) developing and implementing a property valuation system for taxation purposes.

To accelerate the development of the Information Society services in Moldova in connection with the E-Governance programme, as established by the Government of Moldova in August 2010 to ensure transparent governance by using and promoting information technologies in the public sector. 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 ensure Government openness is the open data portal <http://www.date.gov.md>, where all government institutions are able to share data sets. With World Bank's support the Government of Moldova launched its M-Cloud platform in 2013

With donor support of Norwegian Ministry of Foreign Affairs (NMFA) through Norwegian Mapping and Cadastre Authority (SK), JICA and EU funds a National Spatial Data infrastructure (NSDI) is being created in Moldova under the responsibility of Agency for Land Relations and Cadastre (ALRC). A draft NSDI law is approved and a prototype geo-portal, including a number of geospatial datasets and services, has been developed. Good progress has been made but further support is required if the achievements made so far are to be developed into meaningful benefits. In particular, data exchange protocols and procedures need to be developed, standards have to be defined and adopted, more data must be made available in the correct format, and further capacity built in the sector.

The Republic of Moldova did not have any real national geoportal in a wider perspective, i.e. a geoportal that could act as an interface to a national metadata catalogue that enables users to search for and find what existing spatial data exist in the country that could be used for their purposes. Basic spatial data, such as orthophoto and base maps, and some other spatial data were available in digital format but did not follow any international standard and much data were still in formats that were not suitable for digital dissemination. The concept of describing spatial data by metadata was not much recognized and used. Only for some of the available spatial data metadata was created. In the cases where metadata was created it was done mainly to meet the internal needs of the institutions.



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## II. SPATIAL DATA INFRASTRUCTURE IN MOLDOVA

Availability and improvement of spatial data services using reliable data following EU standards and INSPIRE directives is essential for the Republic of Moldova. Sharing of spatial data is important for decision making by public authorities on all levels and efficient and sustainable e-service for the citizens, public bodies and the private sector.

Agency for Land Relations and Cadastre (ALRC) has a role as national coordinator of the NSDI in accordance with Law on NSDI. The ALRC was founded on June 27, 1994 by the Decree No. 230 of the President of the Republic of Moldova. The institution was established for the purpose of development and promotion of state policy and strategy in the field of land administration and regulation of land relations, cadaster and real estate valuation, geodesy, mapping and geoinformation. The institution is directly subordinated to the Government of the Republic of Moldova. ALRC takes part in forecasting of country's socio-economic development, coordinates actions of central branch authorities and local authorities in the field of development and promotion of national programs and plans. In addition, ALRC promotes economic-organizing reforms in its activity domains, harmonizes respective legislative and normative acts with European norms and standards and promotes implementation of innovative technologies in related fields.

The ARLC contributes to implementation of the provisions of the on-going e-Government Programme that includes implementation of a shared platform across Government to consolidate the existing data centres, the transformation of the Government processes to increase public administration efficiency through the use of Information and Communication Technology, development of the electronic services for citizens and business and adoption of an e-Governance regulatory framework according to best international practices, including open governmental data for citizens and business. The e-Government Centre is responsible for developing and implementing the e-Government agenda.

For the purposes of centralized inventory, keeping and use of topographical, geodetic and mapping documents there is National Geospatial Data Fund (NGDF) at ALRC. Topographical, geodetic and mapping documents for the whole territory of the Republic of Moldova are stored in this fund. These materials are of technical, scientific, economic, historical, social and cultural interest. Access to the geospatial data, i.e. scanned topographic maps at different scales, geodetic networks, digital maps, ortophoto etc., is provided to public authorities, the private sector and citizens.

The Republic of Moldova through ALRC is a full member of EuroGeographics, the membership association and acknowledged voice of the European National Mapping, Cadastre and Land Registry Authorities. The purpose of the association is to further develop the European Spatial Data Infrastructure through collaboration in the area of geographic information and the representation of its members and their capabilities. Through EuroGeographics, members participate in policy developments, share knowledge and experience and collaborate to find solutions to common challenges.



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The development of NSDI in Moldova achieved a significant progress in recent years, thanks to the support from the Norwegian Government and Norwegian Mapping and Cadastre Agency “Kartverket”, JICA and EU funds. So far, there are 37 datasets and 17 spatial data services described via metadata on the National Geoportal<sup>1</sup>.

The Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) has been transposed at the national level by means of a Law on National Spatial Data Infrastructure, as well as a Strategy for developing the National Spatial Data Infrastructure during the years 2017-2027. The Law nr. 254 for the establishment of Spatial Data Infrastructure in the Republic of Moldova has been adopted by the Parliament in November 2016.

Both the central and the local public authorities can benefit from the NSDI in Moldova. All main components of the NSDI have been covered:

– *Legal framework.* The NSDI Law consists of a legal framework for the NSDI in the Republic of Moldova. The following requirements are to be found in the draft Law:

- public authorities must develop metadata for spatial data and services covered by the draft Law;
- develop network services in order to make spatial data available over the Internet;
- harmonize spatial data and services in order to make spatial data “interoperable”;
- create a NSDI geoportal that makes it possible to see all meta data and find out which spatial data exist in the country;
- which public authorities (central/local) are responsible for specific spatial data;
- public authorities responsible for spatial data shall share spatial data among them;
- ALRC is appointed as national coordinator of the NSDI.

– *Cooperation.* The NSDI Steering Committee was established in 2017. 22 cooperation agreements for data sharing have been prepared. NSDI cooperation component is shown on Figure 1.



Fig.1 NSDI in Moldova: Cooperation component

<sup>1</sup> [http://www.geoportalinds.gov.md/geonetwork/srv/eng/catalog.search?node=srv#/metadata/\\_6dec85e8-eb6a-4a49-9688-c83f527bf7a5](http://www.geoportalinds.gov.md/geonetwork/srv/eng/catalog.search?node=srv#/metadata/_6dec85e8-eb6a-4a49-9688-c83f527bf7a5)



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– *National geoportal*. Is a web-portal which includes the metadata catalogue, containing metadata created by public entities to describe their own data and services. There is a single point of access to geospatial data through the national geoportal; it is not fully operational yet. Provisional National geoportal of the Republic of Moldova has been developed. It provides information about spatial data and services from public authorities that participated in the project. The portal provides the ability to search, view and download spatial data from different sources (public authorities) and it is considered as a key element of the NSDI of the Republic of Moldova <http://www.geoportalinds.gov.md/>. The provisional National geoportal of Moldova is shown on Figure 2.



Fig. 2. Provisional NSDI Geoportal of Moldova

– *Metadata*. Information describing spatial data sets and spatial data services and making it possible to discover and use them have been deployed. Metadata are not sufficiently developed, though, few organisations have described their data sets in a manner that allows users to find and assess their suitability for use. In case metadata are available, they are primarily meant for internal use and do not adhere to any national or international guidelines.

– *Spatial data*. Stakeholders from 22 public authorities have made their data available. The assessment has showed that quality of spatial data is poor, public authorities are lacking data specifications, spatial data is of different format, spatial is of need to be harmonized. Harmonization of data is a resource intensive and time consuming process. Trainings and workshops have been performed in data harmonization and data standardization in frame of EU Twinning project. Nevertheless, a lot of work still remains to be done.

– *Spatial data services*. It is technical operations, which may be performed, by invoking a computer application, on the spatial data. The spatial data services make it possible for user to have access to data. Some of the stakeholders of public authorities have created view service.

– *Competence*. The Agency for Land Relations and Cadastre had opportunity to develop and upgrade its technical and human capacities in the past decade through many development projects where it has opportunity to cooperate with the World Bank, the Joint Research Centre (JRC) of the European Commission and the Norwegian Mapping and Cadastre Authority Kartverket. EU Twinning projects offered additional NSDI related trainings. Existing national capacities of the



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responsible public authorities for establishment of NSDI are not yet sufficient. Partnership between central, local, academia and private sectors are critical to ensure the success of NSDI.

– *Standards*. Republic of Moldova is lacking national document which defines usage of standards in spatial data domain. A national metadata profile for spatial data services and the guidelines how to use the profiles have been developed.

Several examples of “best practices” related to data sharing in Moldova have been developed over the past years. There are, for instance, the pilot project on Data Harmonization with the Ukraine<sup>2</sup> supported by the JRC, or the data exchange between ALRC and Ministry of Transport and Road Infrastructure as well as with the forest Agency “MOLDSILVA”, that exemplifies how data sharing between different organisations in Moldova already adhere to the principles of INSPIRE.

### III. Open Data and E-Government Strategy

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 ensure Government openness is the open data portal <http://www.date.gov.md>, where all government institutions are able to share data sets. Most of the data available on the Open Data portal are protected by a Law nr. 305 regarding Reusing of Information in Public Sector. The Open Data portal currently includes around 944 data sources and around 30 applications.

### IV. Conclusions

The development of the NSDI in Moldova achieved a significant progress in recent years, thanks to donors support as Norwegian Government and Norwegian Mapping and Cadastre Agency “Kartverket” (2006 to today), JICA and EU funds/TAIEX and Twinning.

Data sharing is already established between several organisations, with ALRC in the lead as the custodian of several fundamental datasets such as orthophoto, administrative boundaries, elevation data, etc. ALRC also provides this data including base maps in different scales, through web-based services, which are widely used by other agencies. However the country is still suffering from the absence of a national centralized metadata catalogue. It remains very difficult for a user to find data in Moldova.

Human resources are limited. Several systems in Moldova are administered by only a limited number of persons, in some cases there is only one person who can maintain a system. There is also lack of competence within several organisations as related to the use of geospatial technologies in general.

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<sup>2</sup> <http://drdsi-pilot.wetransform.to/services.html>



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There is a need for consolidated frameworks regulating the ownership and responsibility of the systems that contain data. Formal agreements related to the exchange of data seem to be still incomplete. It appears that data may be exchanged on slightly different conditions, depending on organisations. No licensing conditions apply, or at least are followed. Data that only can be acquired for a fee from one organisation may be acquired free of charge from another organisation, yet the data source is the same.

In Moldova, many geospatial datasets exist which could provide the basis as a contribution to pan-European needs for selected data themes and components, as shown by the examples above, where many can be seen as relating well to the INSPIRE annexes, although some themes are still missing.

Open data and E-Governance are essential to the sustainable development vision, and especially for the successful maintenance and application of spatial data infrastructure. Legal, institutional and technological reforms need to be closely coordinated. Institutional structures within central government, central-local government partnerships as well as networks between government - private sectors and government-community sectors need to be examined for coherence with legal and technological infrastructures.

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