Agenţia Relaţii Funciare şi Cadastru a Republicii Moldova

INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK

# MOLDOVA

## Baseline Assesment

Kartverket

consultingwhere
Maximising the value of location information

AGENTIA RELATII FUNCIARE SI CADASTRU
REPUBLICA MOLDOVA

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# ABBREVIATIONS

| | |
|---|---|
| CORS | Continually Operating Reference System |
| DT | Diagnostic Tool |
| GIS | Geographical Information System |
| GNSS | Global Navigation Satellite System |
| IGIF | Integrated Geospatial Information Framework |
| ISO | International Standards Organization |
| NSDI | National Spatial Data Infrastructure |
| PSA | Public Services Agency (Agency for Public Services) |
| SDG | Sustainable Development Goal(s) |
| SDI | Spatial Data Infrastructure |
| SK | Statens kartverk, Kartverket, Norwegian Mapping Authority |
| UN-GGIM | United Nations Global Geoinformation Information Management |
| WB | World Bank |

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# PREFACE

The world is experiencing a fourth industrial revolution built upon the internet and a comprehensive data infrastructure of fundamental datasets[1]. The term infrastructure is used here in the same sense as the road network is part of the fundamental infrastructure required to support transportation.

To help achieve this transition, many countries are building national data infrastructures. For instance, the Netherlands has been at the forefront of recognizing that integrating authoritative key data registers, such as buildings, addresses and ownership, into a coherent data infrastructure will, not only make Government more cost-effective, but will also make the interaction for citizens and businesses with Government quicker and more efficient[2] and allow the private sector to derive benefits from new services.

One of the primary components of a data infrastructure is the location of a nation's assets, including land, natural resources, and the built environment to allow these assets to be managed more effectively in the context of development planning and climate change mitigation, for example. This is because "everything happens somewhere" and without knowledge of location (geospatial position[3]), decision making on many matters of national importance is significantly impaired.

The term Spatial Data Infrastructure (SDI) has historically focused on the collection of data and the implementation of technologies. The IGIF provides guidance on how to extend the scope of SDI to cover the governance, policy, financial, capacity and engagement processes necessary to collect, maintain, integrate, and share geospatial information, through all levels of government and society.

In August 2020, the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) adopted the Integrated Geospatial Information Framework (IGIF), which provides the strategic guidance that enables sub-national or national-specific Action Plans to be prepared and implemented to strengthen integrated information management.

The IGIF aims to assist countries (including city and regional governments) to move towards e-economies, e-services, and e-commerce. Delivering socio-economic value by improving services to citizens, enhancing evidence-based government decision making processes, creating new job opportunities, facilitating private sector economic growth, and taking practical actions to achieve a digital transformation. Through these means, IGIF will help to bridge the geospatial digital divide between developed and developing countries and to support the 2030 Agenda for Sustainable Development.

## IGIF Structure

The IGIF comprises of three (3) parts as separate, but connected, documents:

- **Part 1:** Overarching Strategic Framework presents a forward-looking Framework built on national needs and circumstances, focusing on policy, perspectives, and elements of geospatial information. It sets the context of 'why' geospatial information management is a critical element of national social, economic, and environmental development.

[1] United Nations GGIM Fundamental Geospatial Data Themes: https://ggim.un.org/documents/E-C20-2018-7-Add_1-Global-fundamental-geospatial-data-themes.pdf

[2] https://business.gov.nl/regulation/addresses-and-buildings-key-geo-register/

[3] These terms are used in different geographies and contexts and are regarded here as interchangeable.

- **Part 2:** Implementation Guide is the detailed document that provides the 'what', the specific guidance and actions to be taken in implementing the Framework. The aim is to provide guidance for governments to establish 'nationally' integrated geospatial information frameworks in such a way that transformational, albeit staged, change is enabled, visible and sustainable.
- **Part 3:** Country-level Action Plans will provide templates and guides to operationalize the Framework in a national and sub-national context. Providing the 'how, when and who' approach, this document will assist countries to prepare and implement their own country-level Action Plans taking into consideration national circumstances and priorities.

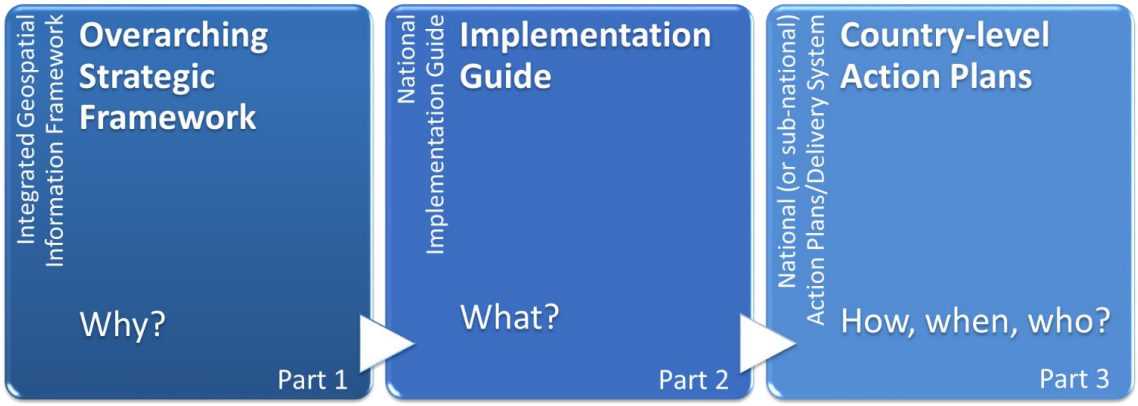



Figure 1: The 3-component documents of the Integrated Geospatial Information Framework

## World Bank IGIF Implementation Methodology

The World Bank Group has established an IGIF Implementation Methodology and corresponding analytical toolkit to support the use of the IGIF and incrementally create SDIs customized to specific countries and priorities. The graphic below illustrates the sequence and relationship of these analytical tools used to arrive at the implementation of the SDI. The symbology shows the analytical tools (in orange), key inputs (in blue), the IGIF in purple, outcomes (in green) and uses arrows to different types of information flows.

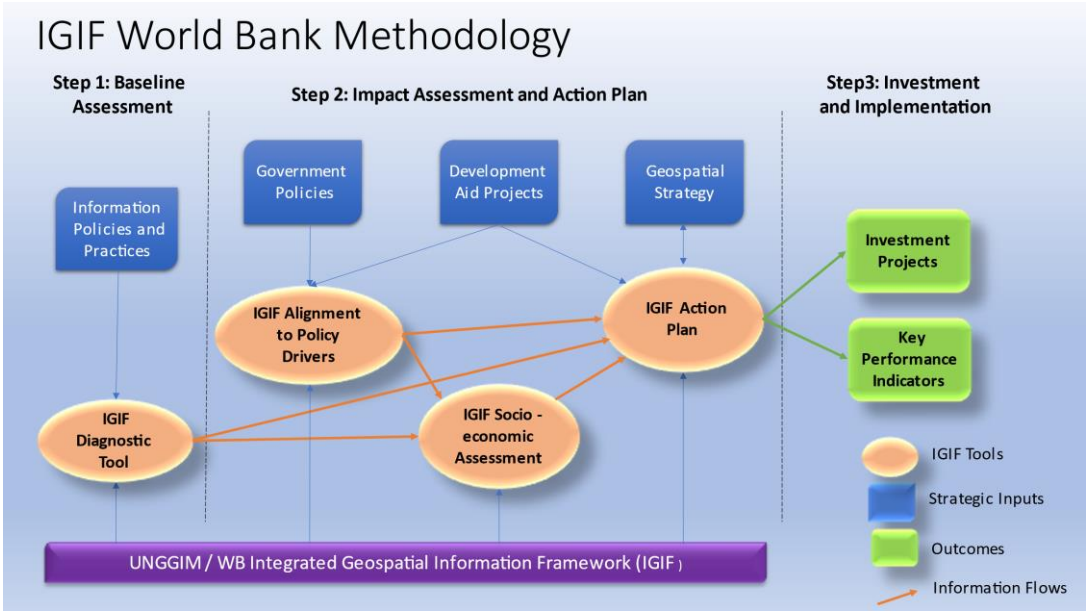



Figure 2: World Bank IGIF Implementation Methodology

In summary, this methodology has been applied as follows:

**Step 1: Baseline Assessment**

A single integrated tool is used for this purpose:

> **Analytical Tool 1 – IGIF Baseline Diagnostic Tool (DT):** this provides an assessment of the "as is" position of geospatial information management in the country, structured around the nine IGIF pathways, including governance, policy, financial, human capacity, and technical perspectives. The output forms a baseline for the next steps.

**Step 2: Impact Assessment and Action Plan**

Three tools are used to build a prioritized, cost-justified roadmap for strengthening integrated geospatial information management:

> **Analytical Tool 2.1 – IGIF Alignment to Government Policy Drivers:** this tool is used to align the Government's strategic objectives and international commitments to specific spatial use cases (applications) and then prioritizes them based on how well they support and accelerate achieving these strategic objectives.
>
> **Analytical Tool 2.2 – IGIF Socio-Economic Impact Assessment**: this tool delivers an assessment of the socio-economic business case for investment in an SDI from both qualitative and quantitative perspectives. It is informed by the outputs from the previous two tools outlined above.
>
> **Analytical Tool 2.3 – IGIF Action Plan**: this tool builds on the previous deliverables to create or update a high-level geospatial strategy and a corresponding costed plan roadmap for SDI enhancements, presented as a series of interdependent policy interventions and implementation projects.

**Step 3: Investment and Implementation**

Once the Action Plan has been approved in terms of scope, investment plan and priorities, then work will commence to identify sources of government and international funding. Individual actions may also need to be specified in greater detail to support implementation planning and the definition of Key Performance Indicators (KPIs) to monitor and evaluate implementation.

These steps must be delivered within a recognized project management methodology that provides proper governance and incorporates transparency and accountability for all tasks and outcomes.

# CONTENTS

# EXECUTIVE SUMMARY

The aim of this Baseline Diagnostic Report is to present the current status of the National SDI in Moldova as a basis for the Action Plan. The baseline is based on the Integrated Geospatial Information Framework (IGIF) developed by the UN-GGIM. The diagnostic method provides an assessment of the "as is" position of geospatial information management in the country, structured around the nine IGIF pathways, including governance, policy, financial, human capacity, and technical perspectives. The output forms a baseline for the next steps.

The Republic of Moldova is a land-locked country in Eastern Europe situated between Romania (to the west) and Ukraine (to the east). The country has a total area of approximately 34 thousand square km with a population of approximately 3.5 million. Moldova enjoys an extremely high literacy rate, the most recent estimate being 99.4% of the population. Moldova became independent from the Soviet Union in 1991 and, since 2009, the Country has been governed by a series of pro-European ruling coalitions. In 2014 the country signed an Association Agreement (AA) and a Free Trade Agreement (DCFTA[4]) with the EU connecting Moldovan products to this market. One outcome of the DCFTA was the redrafting of the Country's Customs legislation and procedures in line with EU standards and to align with the EU's Union Customs Code. **EU integration prospects have been driving the governments' policy reform agenda since 2009 and these developing links with the EU have been a significant contributing factor in the progress of the various policies supporting the development of the geospatial landscape in Moldova and has been one of the drivers behind the development of its National SDI.**

The IGIF is a UN endorsed Framework developed to support the development of national infrastructures for geospatial information management. The framework aims to assist countries to move towards e-economies, e-service, e-commerce, and other services to improve services to citizens in support of the implementation of national strategic priorities together with the 2030 agenda for sustainable development. Since 2006 the Norwegian Mapping Authority has been working with the government of Moldova through its cooperation partner the Agency for Land Relations and Cadastre (ALRC). ALRC is the coordinating authority for the National SDI and is responsible for implementing policy. A baseline assessment of the implementation of the National SDI was completed by ALRC during 2019. This current assessment has been initiated as a means of supporting Moldova with the implementation of its IGIF. The output from this provides a baseline for the next National SDI implementation steps, an assessment (analysis) of the socio-economic business case for investment in the SDI and an Action Plan, a roadmap for SDI enhancements, policy interventions, and implementation projects.

This current (2021) assessment was completed during February, March, and April through engagement with stakeholders. The study commenced with an interactive workshop hosted by ALRC which introduced stakeholders to the purpose, function, and use of the Diagnostic Template (DT). Following the workshop, the DT has been completed by representatives from 19 separate stakeholders. Completion of the DT was followed by evaluations of the completed DT's which, in turn, was followed by discussions and consultations with the various stakeholders. The objective of these consultations was to provide information to gain greater insight and understanding into the scores allocated to the selected 'indicators' by the various stakeholders.

The assessment of the DT and subsequent consultations with stakeholders identified the key strengths and weaknesses across the IGIF pathways. The key strengths correlate to governance, innovation, and data. The key weaknesses correlate to finance, education/capacity, and communication/engagement.

The feedback from the stakeholder community is positive and there is good support from across the stakeholders for the implementation of the National SDI. Stakeholders generally are enthusiastic

[4] Deep and Comprehensive Free Trade Agreement

about making a success of the National SDI, very committed to this, and the stakeholder engagements were generally positive. The work of ALRC is appreciated and resulted in positive feedback regarding its role and its commitment. However, not all stakeholders are fully aware of the progress being made, this was evident in terms of Governance and very evident in terms of Legal and Policy, and Finance. **While significant effort has been made regarding the development of the National SDI the output from the stakeholder consultations is that many stakeholders are not fully aware or not fully informed of these initiatives and the progress that has been made and this will have had implications on the assessment**.

Overall, given the limited resources available to them, our observation is that ALRC is providing a valuable service and that the implementation of the National SDI is broadly supported and endorsed. However, at a national level, there are areas for improvement and the report identifies a number of areas where preemptive or tactical actions would provide some early benefits.

- Identify a 'Champion' and establish a Leadership team. To sustain the implementation of the SDI this team needs to have a very clear mandate to allow it to lead, engage, and promote the benefits of the SDI and identify, implement, and monitor change. The operating model needs to be defined which clearly identifies decision making responsibilities and powers of delegation and provide for meaningful monitoring, evaluation, and implementation.
- Establish a stakeholder communication strategy. Communication and engagement with stakeholders is essential if the SDI is to be successful. A suitable communication strategy will keep stakeholders informed and engaged.
- Agree priorities for a national SDI strategy/geospatial strategy. The strategy should be linked to the NSDI operating model and support the strategic priorities/policy drivers.
- Initiate the development of a business model. This will need to identify the budget needed to support the implementation of the National SDI, identify options for how this will be funded, and re-state the potential benefits to be realized. This should include a roadmap for reducing dependency on external donor support.
- Establish an operational Working Group on Standards. This will deal with issues related to interoperability, standards needs assessment, national standards strategy, standards awareness program, content, and a national action plan for rolling out data standards and technical specification.
- Promote an awareness and benefits of partnering, the types of collaboration/partnering available, and build a longer term strategy for partnering to investigate the benefits to be gained through Public Private Partnerships for the delivery of new or improved and innovative geospatial products and services.
- Invest in education and capacity development. There is a need to strengthen human capacity in order to make the geospatial information management more effective and sustainable. This can be achieved by raising awareness of the benefits and values of geospatial information, curriculum development with universities, and investing/promoting continual technical and professional development.

# PART 1: CONTEXT

## Purpose

The Baseline Report is an intermediate deliverable that summarizes the current status of the National SDI. The baseline report will feed into the Action Plan. The report contains recommendations of short-term actions, which may positively influence the achievement of the Action Plan.

## Audience

The primary audience for this report is the stakeholders who contributed to the completion of the consolidated Diagnostic Tool (DT) to allow them to validate the reporting of the current state.

## Why this report is being written?

As described in the Introduction, the Integrated Geospatial Information Framework (IGIF) is a UN endorsed Framework developed to support the development of national infrastructures for geospatial information management in developing countries. The framework aims to assist countries to move towards e-economies, e-service, e-commerce, and other services to improve services to citizens in support of the implementation of national strategic priorities together with the 2030 agenda for sustainable development. Since 2006, the Norwegian Mapping Authority has been working with the government of Moldova through its cooperation partner the Agency for Land Relations and Cadastre (ALRC). ALRC is the coordinating authority for the National SDI and is responsible for implementing policy. A baseline assessment of the implementation of the National SDI was completed by ALRC during 2019. The assessment was in collaboration with nominated stakeholders for the public and private sector and the results of this assessment were shared during 2020. This current assessment has been initiated as a means of supporting Moldova, through engagement with ALRC, with the implementation of its IGIF. This study, structured around the nine IGIF pathways described in Part 3, provides an assessment of the "as is" position of the implementation of the National SDI. The output from this provides a baseline for the next steps.

## Brief Country Description

The Republic of Moldova is a land-locked country in Eastern Europe situated between Romania (to the west) and Ukraine (to the east). The country has a total area of approximately 34 thousand square km with a population of approximately 3.5 million[5]. Although the urban population is less than half of the total population, Moldova enjoys an extremely high literacy rate, the most recent estimate being 99.4% of the population.

Moldova became independent in 1991 and, since 2009, the country has been governed by a series of pro-European ruling coalitions. The government is a parliamentary republic, and the Executive comprises a Head of State (President), a Head of Government (currently the Acting Prime Minister), and a Cabinet. The administration of the country is via three municipalities (first level administrative areas), 32 rayons[6] (second level administrative areas), and 2 autonomous regions.

The economy relies heavily on the agricultural sector but has some natural resources including lignite, phosphorites, gypsum, and limestone. With few natural energy resources, Moldova imports almost all of its energy supplies from Russia and Ukraine and has an objective of connecting with the European power grid by 2022. Stronger integration with Europe is a stated goal of the government and this has resulted in some market-oriented progress. Moldova has experienced economic growth since 2017,

[5] https://www.cia.gov/the-world-factbook/static/9aab5d68865c8b061952a3dc63ac3a69/MD-summary.pdf

[6] translated as referring to districts or departments

largely driven by increased consumption, increased revenue from agricultural exports, and improved tax collection[7]. During 2014, Moldova signed an Association Agreement (AA) and a Free Trade Agreement (DCFTA[8]) with the EU connecting Moldovan products to this market. The EU AA/DCFTA has contributed to significant growth in Moldova's exports to the EU and in recent years, the EU purchased over 65% of Moldova's exports[9].

One outcome of the DCFTA was the redrafting of the Country's Customs legislation and procedures in line with EU standards and to align with the EU's Union Customs Code. This has reduced business costs, boosted competitiveness, and has raised Moldova's ranking in the World Bank's Ease of Doing Business index and, although this has deteriorated marginally over the past 18 months (47 to 48) the DCFTA has resulted in a significant improvement to the 'doing business' indicators and reflects a regulatory environment that has become is conducive to business operation together with stronger protections of property rights[10].

EU integration prospects have been driving the governments' policy reform agenda since 2009 and these developing links with the EU have been a significant contributing factor in the progress of the various policies supporting the development of the geospatial landscape in Moldova and has been one of the drivers behind the development of its National SDI.

## Recent, current, and proposed Geospatial activity

The use and application of geospatial information is not a recent activity to Moldova. A driver for much of this was the need for land reform following independence. To facilitate this a government entity, the Agency for Land Relations and Cadastre (ALRC) was established in 1994. The primary role of ALRC is the development and promotion of state policy and strategy in the field of land administration with responsibilities including, land registration, cadastre, geodesy, topographic mapping, thematic mapping, aerial photography, imagery, and the implementation of the National SDI11.

In 1997 – 2006, much progress was reported with the land privatisation process with support from the WB and other donors. The stated development goal of this support was to achieve economic growth supported by the functioning land market and the assistance from Norway has contributed to improvement of public services providing open access to geospatial data on the Internet.

In terms of support towards the implementation of a National SDI Moldova has benefited from strong relationships with a number of strategic partners including assistance from the World Bank, which has supported integration with the EU INSPIRE Geoportal, capacity building, the development of standards.

Assistance from the Norwegian Government, through the Norwegian Mapping Authority, which has had a strong relationship with ALRC since 2006, provided support for the implementation of various geospatial projects, including:

- Ortho-imagery and Digital Terrain Modell;
- The development of a GNSS Positioning Service (MoldPOS);
- The development of a property information system (MoldLIS);
- Production of a digital topographic basemap – a first up-to-date map since 1980s, as well as

[7] https://www.cia.gov/the-world-factbook/countries/moldova/#economy

[8] Deep and Comprehensive Free Trade Agreement

[9] http://eubam.org/wp-content/uploads/2017/10/Pisar_1-2.pdf

[10] https://tradingeconomics.com/moldova/ease-of-doing-business#:~:text=Ease%20of%20Doing%20Business%20in%20Moldova%20is%20expected%20to%20reach,according%20to%20our%20econometric%20models.

[11] http://www.arfc.gov.md/

- Current direct support to the implementation of the National SDI.

Assistance through EU Twinning project for the development of NSDI, which has provided support for improvements with spatial data services based on EU standards, guidance on updates to the National SDI legal framework, developing standardised network services for sharing of spatial data, and capacity building associated with the National SDI. For details on this and other donor activities associated with this, (see Ovdii & Busch, 2020) [12]

## Summary of SDI background

The development of the National SDI has progressed over recent years through support from various donors including the United Nations, World Bank, European Union, and the Norwegian Mapping Authority as outlined in the previous paragraph. A significant milestone for this was the publication of Law 254 of 2016 [13] on national spatial data infrastructures. This Law, together with various amendments, Government Decisions and Government Orders, provides the general rules, together with the necessary political endorsement, regarding the establishment of the National SDI. The scope of the Law includes all spatial data sets as specified in the annexes to the Law, data content, data availability, data sharing, metadata, interoperability of the data, data services, data access, data use, together with the relevant responsibilities of the public entities and third parties. The spatial data sets identified in Annex 1, 2, and 3 of the Law are based on the EU Directive Inspire[14] and represents a broader range of data themes than the fundamental datasets covered by IGIF.

An initial assessment of SDI was completed during 2019 (see Ovdii & Busch 2020)[15], using the then recently developed IGIF Baseline Assessment using the World Bank IGIF Implementation Methodology (described in the Introduction to this report). This assessment method used a Diagnostic Tool (DT) or Diagnostic Template (a MS Excel file), which contains a series of questions (so called Indicators) for each of the IGIF Strategic Pathways. Contributors to the assessment were asked to 'score' each indicator using guidelines and parameters provided in the DT. The 2019 assessment was based on input from stakeholders and data producers who were active participants in the development of the National SDI.

In parallel with the activities described in this report, an activity by a team representing EU ENI 2020 (referred to as Twinning project MD 16 ENI OT 01 19) has been undertaking a series of missions with ALRC with the objective of identifying improvements to Spatial Data Services in Moldova based on EU standards. The general scope of this Twinning project includes an assessment of the current state of NSDI implementation, maintenance and development including legal, institutional, technical/technological and financial framework, organization, coordination, human resources, data, procedures, sharing agreements, achievements, lessons learned. However, from what is currently understood, this Twinning study is focused on ALRC, while the IGIF assessment has been applied to a wide range of stakeholders at national level. As such, the two studies are complementary.

[12] Ovdii M, Busch E, Implementation of the Integrated Geospatial Information Framework in Moldova; 2020 World Bank Conference on Land and Poverty, The World Bank, Washington, 2020;

[13] https://www.legis.md/cautare/getResults?doc_id=105790&lang=ro

[14] https://inspire.ec.europa.eu/Themes/Data-Specifications/2892

[15] Ovdii M, Busch E, Implementation of the Integrated Geospatial Information Framework in Moldova; 2020 World Bank Conference on Land and Poverty, The World Bank, Washington, 2020;

# PART 2: RESULTS

## Method

This 2021 assessment follows the same principles as described in the Introduction to this report. The assessment is based on the use of the Diagnostic tool. The methodology and diagnostic tool have continued to be developed by the WB and the current version of the DT (IGIF Diagnostic Tool Version 3.0 January 2021) has been applied for this study. The stakeholders who participated in this study have been introduced to the purpose, function, and use of the DT through an interactive workshop on 18-19 February 2021 hosted by ALRC. The workshop introduced IGIF, the Strategic Pathways, and the Diagnostic Template including its purpose, structure, and content. The consultants from ALRC also assisted stakeholders with completion of the DT where this was required. During March and April 2021, the DT has been completed by representatives from 19 separate stakeholder. Completion of the DT was followed by evaluations of the completed DTs by the study team which, in turn, was followed by discussions and consultations with the various stakeholders. The objective of these consultations was to provide information to gain greater insight and understanding into the scores allocated to the selected 'indicators' by the various stakeholders.

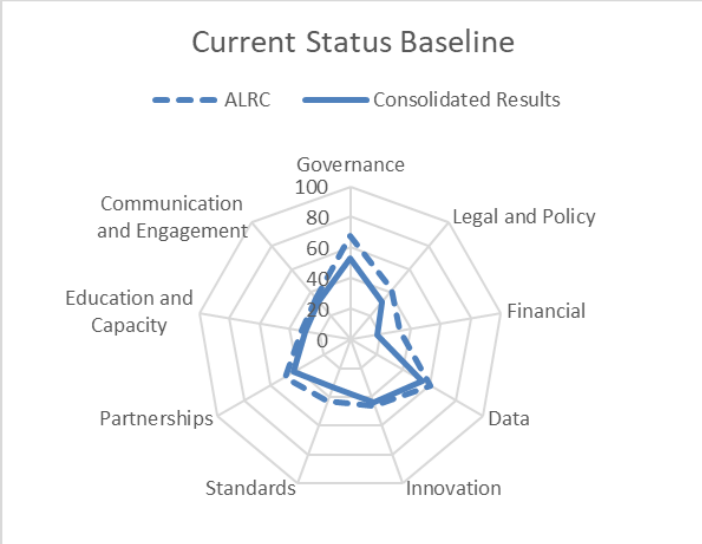
## Current State Score

This section of the report presents the results of the baseline assessment and are based upon analysis of the indicator scores contained in the individual DT questionnaires. The scoring system used by the DT is intended to reflect the degree to which a country has developed each particular strategic pathway. These scores have been averaged for the contributing stakeholders to provide an overall score for the current SDI. The scores are presented in tabular and graphical form (as a radar diagram) in which the score for each strategic pathway is presented along a separate axis.

Scores for the individual Strategic Pathways were:

### 2.1 ALRC Baseline/Consolidated Results from All Contributors:

| | ALRC | Consolidated Results |
|---|---|---|
| Governance | 68 | **53** |
| Legal and Policy | 42 | **32** |
| Financial | 33 | **18** |
| Data | 60 | **54** |
| Innovation | 46 | **44** |
| Standards | 43 | **33** |
| Partnerships | 49 | **43** |
| Education and Capacity | 32 | **30** |
| Communication and Engagement | 35 | **32** |
| Score | 46 | **38** |




The results and overall pattern between the ALRC Baseline and Consolidated Results are rather similar. There is some variance for Governance, Legal & Policy, Financial and some minor variance across some of the other Pathways.

## 2.2 ALRC Baseline/Consolidated Results from Public Sector Contributors (13)

| | ALRC | Public Sector |
|---|---|---|
| Governance | 68 | **52** |
| Legal and Policy | 42 | **33** |
| Financial | 33 | **21** |
| Data | 60 | **54** |
| Innovation | 46 | **42** |
| Standards | 43 | **28** |
| Partnerships | 49 | **39** |
| Education and Capacity | 32 | **30** |
| Communication and Engagement | 35 | **30** |
| Score | 46 | **36** |


These summary results are similar to those presented under 2.1. To be expected as the majority of the stakeholders who contributed to the study were representatives from public sector agencies.

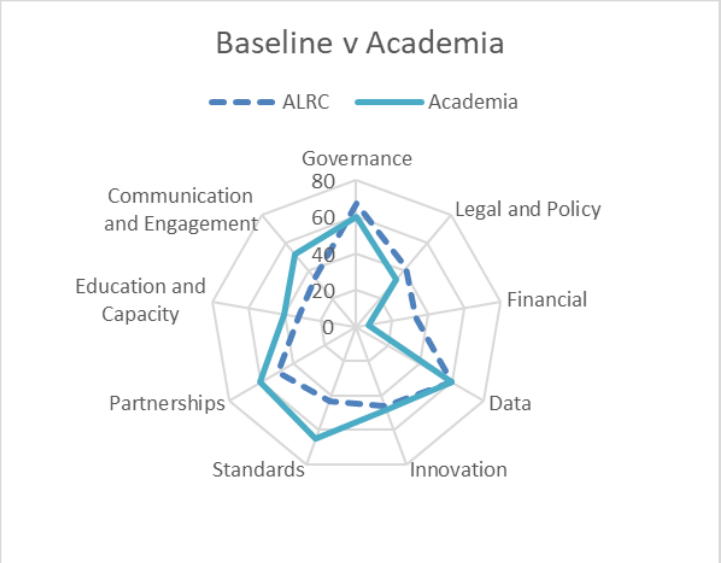
## 2.3 ALRC Baseline/Consolidated Results from Private Sector Contributors (2)

| | ALRC | Private Sector |
|---|---|---|
| Governance | 68 | **46** |
| Legal and Policy | 42 | **24** |
| Financial | 33 | **15** |
| Data | 60 | **50** |
| Innovation | 46 | **49** |
| Standards | 43 | **16** |
| Partnerships | 49 | **38** |
| Education and Capacity | 32 | **19** |
| Communication and Engagement | 35 | **21** |
| Score | 46 | **31** |


The results and overall pattern between the baseline results and the results from the private sector contributors show a marked divergence across all of the pathways with a single positive divergence in regard to Innovation.

2.4 ALRC Baseline/Consolidated Results fromAcademic Sector Contributors (3):

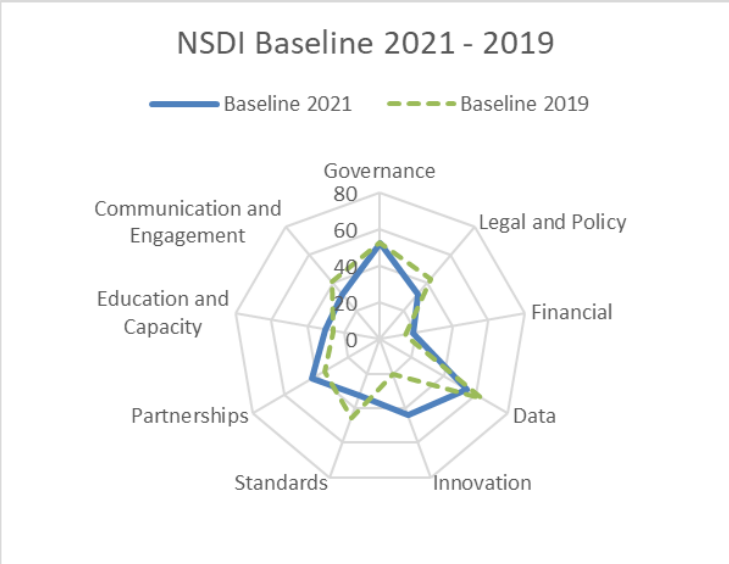
| | ALRC | Academia |
|---|---|---|
| Governance | 68 | **60** |
| Legal and Policy | 42 | **33** |
| Financial | 33 | **6** |
| Data | 60 | **60** |
| Innovation | 46 | **48** |
| Standards | 43 | **65** |
| Partnerships | 49 | **60** |
| Education and Capacity | 32 | **40** |
| Communication and Engagement | 35 | **52** |
| Score | 46 | **47** |




The results and pattern between the baseline results and the results from the academic sector contributors show some consistency across Governance, Legal and Policy, Data, and Innovation, with positive divergence for Standards, Partnerships, Education, and Communication, and a significant negative divergence against the Financial pathway.

2.5 Consolidated Results Baseline 2021 v 2019:

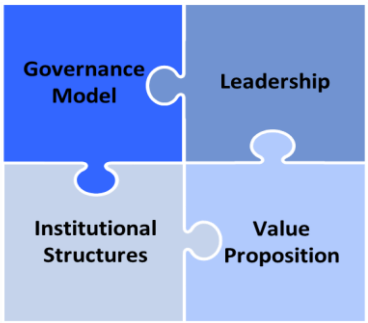
| | Baseline 2021 | Baseline 2019 | Variance |
|---|---|---|---|
| Governance | **53** | 53 | 0 |
| Legal and Policy | **32** | 43 | -11 |
| Financial | **18** | 14 | 4 |
| Data | **54** | 64 | -10 |
| Innovation | **44** | 20 | 24 |
| Standards | **33** | 46 | -13 |
| Partnerships | **43** | 35 | 8 |
| Education and Cap | **30** | 26 | 4 |
| Communication an | **32** | 41 | -9 |
| Score | 38 | 38 | 0 |




The results and pattern between the 2021 baseline results and the results from the 2019 study shows some consistency in the general pattern of the scores however, the results show a reduced understanding or appreciation across Legal and Policy, Data, and Standards and a much improved understanding for Innovation.

# PART 3: STRATEGIC PATHWAY HIGHLIGHTS

## 3.1 Governance and Institutions




This strategic pathway establishes the leadership, governance model, institutional arrangements, and a clear value proposition to strengthen multi-disciplinary and multi-sectoral participation in, and a commitment to, achieving an Integrated Geospatial Information Framework.

The objective is to attain political endorsement, strengthen institutional mandates and build a cooperative data sharing environment through a shared vision and understanding of the value of an Integrated Geospatial Information Framework, and the roles and responsibilities to achieve the vision.

### Overview of Current Situation

The current situation regarding this Strategic Pathway is the existence of clear institutional arrangements defined in Law. Governance (and Leadership) will underpin the NSDI operating model and will be essential to ensure that the principles of the operating model, when implemented, are maintained over time. Law no 254 from 2016 on National Spatial Data Infrastructure[16] governs much of the activity associated with the implementation of IGIF. In terms of Governance and Institutions, the Law identifies a coordinating authority, the authority responsible for implementing NSDI policy, a role currently fulfilled by the Agency for Land Relations and Cadastre (ALRC). The Law also identifies a Council for NSDI. While the Law contains no direct reference to a Governance function per se, the Council has been identified as providing a consultative role with regard to NSDI policy (see also Government Decision no 459 of 2017)[17]. While the Law does not specify or describe a governance framework the implementation of this Law, together with the various Government Decisions associated with the Law, provides the necessary political endorsement for the development of a National SDI.

### Strengths

As is evident from the existence of the Law, the concept of a National SDI has political endorsement. Additionally, the outcome from the baseline study demonstrates that the concept of governance, and the institutional structures associated with this, are understood and supported. The role of ALRC as the coordinating body is widely recognized and the consensus from the stakeholder feedback was that ALRC fulfills the coordinator role well.

ALRC also has a key role in the efficient and effective implementation of a number of working groups and the administration associated with the institutional arrangements supporting 'custodianship' of the various data sets supporting the National SDI. Working Groups have been established by Government Order 66, 67, and 68 of 2017 covering (i) spatial data sharing[18], (ii) technical[19], and (iii) capacity[20] building[21]. The institutional arrangements specifying the public entities responsible for the

[16] https://www.legis.md/cautare/getResults?doc_id=105790&lang=ro
[17] https://www.legis.md/cautare/getResults?doc_id=114062&lang=ro
[18] https://www.legis.md/cautare/getResults?doc_id=120940&lang=ro
[19] https://www.legis.md/cautare/getResults?doc_id=120942&lang=ro
[20] In the English translation Order 68 states capacity but the detail describes awareness
[21] https://www.legis.md/cautare/getResults?doc_id=120943&lang=ro

establishment and promotion of the national spatial data infrastructure and associated services has been established by Government Decision 458 from 2017[22].

There is also a framework for monitoring the implementation of the National SDI and this is covered by Government Order no 23 of 2020[23]. This covers the data and metadata published on the various thematic geoportals with systematic updates every six months and published on the information page of the National SDI (www.inds.gov.md). The administration of this monitoring activity is the responsibility of ALRC.

**Weaknesses**

The indicators of the baseline study suggest that the concept of Governance is reasonably well understood. However, what does appear to be lacking is the application of Leadership. While the role of ALRC as the coordinating body is widely recognized, based on the feedback from the stakeholders the role of the Council was invisible.

While ALRC is the coordinating authority responsible for implementing policy for the National SDI, the authority of ALRC to influence, control, or coerce the various stakeholders appears to be limited. Without such authority, being clearly recognized, understood, and supported across all agencies then there is a risk that ALRC may not be able to fulfill its brief.

In terms of Governance, the operating model is very public sector centric. There was feedback (from stakeholders representing the private sector) that ALRC needs to be more pro-active in engaging with the private sector (lack of private sector engagement was a recurring theme).

As far, as could be determined there are no published key performance indicators (KPI's) available to facilitate the effective monitoring of the implementation of the National SDI.

There is a lack of a National SDI strategy/geospatial strategy that identifies the goals and objectives of the geospatial information initiative. As part of the EU ENI Twinning Project for ALRC, a draft strategy was created. However, this was not approved by the Government (a copy has been requested for review purposes).

While the existence of the Law provides for a form of Governance framework, the nature of this framework was not always obvious to the various stakeholders associated with the National SDI. Feedback included comments such as the benefits of a National SDI not being fully understood and that the necessary support is not always provided or is available. This lack of awareness suggests a deficiency in the communication and/or engagement with all stakeholders.

## 3.2 Policy and Legal


This strategic pathway establishes a robust policy and legal framework that is essential for instituting effective, efficient, and secure management and exchange of geospatial information - nationally and sub-nationally.

The objective is to address current policy and legal issues by improving the policies and laws associated with, and having an impact on, geospatial information management. This is achieved by proactively monitoring the policy and legal environment, including mandating responsibility for the production of data, and keeping abreast of issues and

[22] https://www.legis.md/cautare/getResults?doc_id=114061&lang=ro
[23] http://arfc.gov.md/files/Ordinul_monitorizare%2023_01_06_2020.pdf

challenges arising from the evolving, innovative and creative use of geospatial information and emerging technologies.

## Overview of Current Situation

The current situation regarding this Strategic Pathway is the existence of the Law 254 from 2016 on national spatial data infrastructures, which provides the framework for the implementation of the SDI. This Law, together with various amendments included in 2018, sets the general rules with regard to the establishment of the National SDI and establishes the legal and policy framework for the implementation of the SDI. The scope of the Law is summarized in Part 1 of this report.

In terms of this legal and policy framework, the study yielded mixed results. There are a number of low scores from public entities indicating that representatives from some of the stakeholders have either a lack of awareness of the Law or a lack of understanding of the Law or both.

In terms of key activities such as data sharing, data licensing, and data privacy and protection there was reference to the informal agreements, which may be in place between public entities. For this to be effective agreements, need to be formalized rather than left to individual interpretation. There were comments that these issues would be much more effective if all stakeholders managed their data and shared their data via the data portals, i.e. there is inconsistency in the approach to such data sharing. The legal framework for intellectual property covers all data and is not specific to geospatial data. There are also established processes for data protection, which exist through regulations and the legal framework. The legal framework for intellectual property and data protection is generic not specific for geospatial data[24] which is to be expected.

## Strengths

Law 254 of 2016 and associated Government Decisions and Orders[25] is consistent with international good practice and reflects standards contained within the EU INSPIRE directive.

In addition to the implementation of the Law, ALRC has developed guidelines related to the provision of data and data services. ALRC adheres to the policy of Open Data, spatial data sets and services created by public entities are available free of charge to the public provided this is for non-commercial purposes. Fees may be charged if the data is to be re-used for commercial purposes, the fees being subject to certain conditions described in the Law. Responsibility (not liability) of public entities for individual spatial data themes are prescribed in government decision 458 of 2017[26]. Responsibilities include the provision of access to the spatial data and services, maintaining the description of the data and ensuring that the themes are current, complete, and available. The existence of this Law and associated legislation is a great advantage to the implementation of the SDI.

## Weaknesses

We were informed that there were no published regulations regarding the licensing of spatial data[27]. The conditions of use are described in the metadata on National Geoportal (geoportalinds.gov.md) or may be established in individual agreements, with the result that individual institutions can establish individual policies and conditions. This could result in duplication, misinterpretation, and misunderstanding.

Feedback received from the private sector representatives was a request for clarity and certainty about the 'rules of the game'. The private sector needs to understand how the data can be used, what

[24] http://www.agepi.gov.md/ro/legislatie/nationale)

[25] http://inds.gov.md/transparenta-decizionala/acte-legislative-si-normative

[26] https://www.legis.md/cautare/getResults?doc_id=114061&lang=ro

[27] https://kartverket.sharepoint.com/:x:/r/sites/MoldovaIGIF/Delte%20dokumenter/General/4-New%20Diagnostic%20Tools/Completed%20Diagnostic%20Templates/1_IGIF_DT_EN_ALRC_IP_JC_DR_v2.xlsx?d=w044a8f185708448b97cb22ac9eb8e572&csf=1&web=1&e=WgNNAe

are the limitations if any on the use of the data, and costs associated with this use. The rules need to be clear and not applied retrospectively and, it was suggested that this depends on the decision-makers having a good understanding of the needs of the private sector. Until the private sector has this confidence then this will remain a barrier to the deployment of the National SDI.

In terms of the responsibilities of stakeholders, it was reported that, while there are some guidelines, the stakeholders have no defined terms of reference, which specify the responsibilities of the individual stakeholders. A consequence of this is the risk of lack of consistency in stakeholder engagement.

## 3.3 Financial


This strategic pathway establishes the business model, develops financial partnerships, and identifies the investment needs and means of financing for delivering integrated geospatial information management, as well as recognizing the benefits realization milestones that will achieve and maintain momentum.

The objective is to achieve an understanding of the financial plans required to establish and maintain an integrated geospatial information management, as well as the longer-term investment program that enables government to respond to evolving societal, environmental, and economic demands for geospatial data.

### Overview of Current Situation

The current situation regarding this Strategic Pathway is that Moldova has been successful at accessing external funding. There has been, and continues to be, excellent collaboration with various international donors, such as the Norwegian Mapping Authority, European Commission, and World Bank, all of which have provided funding for projects which support the implementation of the National SDI. However, outside of the various donors, there appears to be a lack of a cohesive and consistent understanding of how the implementation of the National SDI will continue to be financed. At present there is no business model supporting the National SDI although it is anticipated that this may be developed as an outcome of the various international projects, which are currently in place.

The concept of a central function for the financial management to support the implementation of the National SDI is missing. There is no single authority with financial responsibility and accountability for ensuring investment in the National SDI is identified, is appropriate, is achieved, and is sustainable. ALRC is the coordinating authority with responsibility for implementing policy relating to the National SDI, but this role does not have any stated financial responsibility provided for in the Law.

Additionally, while individual public entities have been identified as the responsible entities for specified data themes, the funding needed to sustain this needs to be secured annually from the government. Each entity has to seek funding from central government and provide appropriate justification, but it was reported that there is a lack of guidance specifying what costs can be taken into account for the delivery of these services. Where this funding is needed to support any National SDI/geospatial activities or projects there is the possibility of multiple projects having similar objectives with the risk of duplication of effort.

**Strengths**

Experience with securing external funding from donors.

The government has committed to financing the National SDI for activities related to data creation, sharing, maintenance, and associated services. The Law identifies which agencies are responsible for which data themes and the financing (in theory) is available is through the budgets of the individual entities.

**Weaknesses**

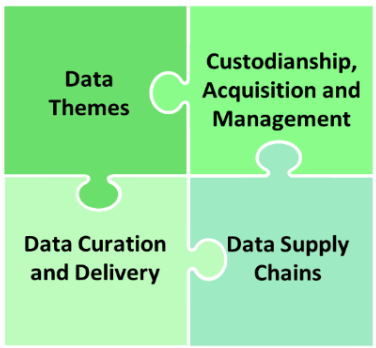
In commercial terms, there is a lack of understanding at a senior level of the benefits that a National SDI could provide.

There is some understanding of the opportunities from some stakeholders but these opportunities, where they exist, have not been exploited due to a lack understanding of the potential benefits to be gained through the implementation of the National SDI.

There is no evidence of any assessment or evaluation of potential revenue streams which may become available because of the implementation of the National SDI.

Dependencies on external donor funding.

## 3.4 Data




This strategic pathway establishes a geospatial data framework and custodianship guidelines for best practice collection and management of integrated geospatial information that is appropriate to cross sector and multidisciplinary collaboration.

The objective is to enable data custodians to meet their data management, sharing and reuse obligations to government and the user community through the execution of well-defined data supply chains for organizing, planning, acquiring, integrating, curating, publishing and archiving geospatial information.

**Overview of Current Situation**

The current situation regarding this Strategic Pathway Data is that the government fundamental geospatial and statistical data holdings are well organized and mainly conform to the UN-GGIM recommended fundamental themes. The developed Data Framework is a methodology for organizing a country's geospatial and statistical data, and other information that is rather well used for specific applications. This framework supports the development of national geoportal, so information can be accessed and used.

In terms of fundamental data themes, the data custodians have been partly allocated/mandated with the responsibility for the management of their data with the consequence that only few agencies fully comply with existing guidelines and take their required responsibility.

Very few organizations have a Data Quality Management (DQM) plan, and so quality dimensions are poorly monitored. In order to ensure the quality of spatial data services, Government Decision no 737/2017 on rules for creating of network services for spatial data has been established. However,

only a very limited number of data/service providers have the competences and resources to fulfill these requirements.

The NSDI Law 254 from 2016 includes the main official guidelines for sharing/releasing geospatial information. All relevant entities are obliged by a specific law to transfer all their systems and data in the M Cloud (being a governmental secure storage (cloud) environment).

Data exchange is not properly formalized at a national level, so agreements have mainly been based on individual/ad hoc basis and interoperability issues arise frequently.

There is a common national geodetic datum reference, projection and co-ordinate system (MOLDPOS/MOLDREF99), which associated information is well accessible and used by the majority of stakeholders.

Finally, it is remarkable that the management quality of geospatial information differs significantly among the NSDI-Stakeholders organizations. For examples, some entities capture and/or maintain their data within their care, meanwhile others do not invest much in their data capture/maintenance. This means that several duplicated datasets still exist, however there are initiatives to resolve this costly overhead for some data themes (such as aerial imagery). Metadata are maintained for most datasets, but not for all.

**Strengths**

The main strong points refer to the establishment of a strong geodetic infrastructure, the establishment of a strong Data Framework to organize the country's fundamental geospatial and statistical data holdings; the identification of a set of fundamental datasets for each data theme with its own data profile, and the management of fundamental datasets in the M-Cloud as secure storage and retrieval environment.

**Weaknesses**

The most significant areas of weakness refer to data quality, data release, and data custodianship. Other areas of weakness are data interoperability, data supply chain and data gap analysis, and the high diversity of data theme roadmap, data capture and data acquisition. Each of these are briefly explained below.

Few of the fundamental datasets are managed according to a so-called Data Quality Management (DQM) plan that assures information is fit-for-purpose. Data quality is generally described in terms of data specifications and instructions (see e.g. cadastral, topography, orthophoto).

Although official guidelines for sharing/releasing geospatial information are provided in the context of the NSDI Law, only a few organizations have the knowledge, skills and resources to apply them appropriately.

Data custodianship has been partly assigned and guidelines exist but only few agencies do comply. Most of the responsible entities are familiar with the Government Decision 458 from 2017 on responsibilities, but not all of them have taken steps regarding implementing their responsibilities.

In the context of data interoperability, relevant data models comply with a national standard and are curated and aggregated at the national level, but there are only a limited number of available data sets integrated and used.

Another area of weakness refers to the weak data supply chains. Most chains are formally established on an individual and ad hoc basis. This means that the governance of data supply is rather scattered and fragmented leading to inefficient data exchange processes.

Despite that several critical fundamental geospatial datasets are created, no formal gap analysis to identify critical datasets has been undertaken so far.

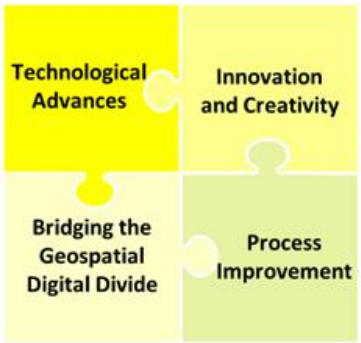
Finally, the organizational diversity in terms of data theme roadmap, data capture and data acquisition is very high. Some public entities use effective data capture methods and maintain their datasets very well, meanwhile others do use fewer effective data capture methods and do not take much attention to their data maintenance. Moreover, some organizations take significant effort to avoid data duplication, meanwhile others do not take much attention regarding data duplication.

| | Data Theme | Current Status/Remarks |
|---|---|---|
|  | Geodetic Reference Frame | Government decision 48/2001 established the national geodetic network MOLDREF99 (EPSG 4026). MOLDREF99 is represented by ground points and state GNSS network – MOLDPOS. The investment was financed by the Norwegian Government. |
|  | Geographical Names | No unique national approach for managing and updating the geographical names at a centralised national level. There is a project (financed by Norway) on creating a national registry for geographical names. |
|  | Addresses | Law 151 of 2017 applies to addresses. The responsibility for addresses is with the Agency for Public Services. This is updated daily and has 70% coverage. Datatype: vector (lines and points) |
|  | Functional Area | Several relevant datasets exist (including administrative boundaries, statistical units, planning zones). These datasets cover different areas ranging from national to some local areas. Datatype: vector. |
|  | Buildings and Settlements | This dataset is maintained by the Agency for Public Services. This is updated daily, based on active cadastral work, and has 80% coverage. Datatype: vector. |
|  | Land Parcels | Buildings dataset is maintained by the Agency for Public Services. The dataset contains vector representation of land parcels (land areas) with cadastral identification numbers. The frequency of updating is daily, based on the active cadastral works and has 80% coverage. Geometry type of objects: polygon. |
|  | Transport Networks | Responsible Agency for Transport networks is the State Road Administration, State Enterprise Moldovan Railway, and State Enterprise for Airspace Use and Air Traffic Service. The responsibility for local roads is on the local public authorities. The following datasets are available: Public roads (100% coverage); Local roads and Parking (Chisinau). Update frequency is as required and is not standardized. |
|  | Elevation and Depth | Responsible agency is Agency for Land Relations and Cadastre. Now, there are 5 datasets (for different years) and 3 network services have been created. Four of these are DTM. Coverage is 100% (excluding Transnistria). Data is vector format. Update frequency is as required the case and it is not standardized. |
|  | Population Distribution | Responsibility of the National Bureau of Statistics. Not spatial data but it is possible to geo-reference the statistical (tabular) data, which have |

| | | |
|---|---|---|
| | | open access. Population data exists for Chisinau municipality (E-Urbanism). |
| | Land Cover and Land Use | Responsibility of the Ministry for Agriculture, Regional Development and Environment. Land use is the responsibility of the Agency for Land Relations and Cadastre and Ministry for Agriculture, Regional Development and Environment. For Land Cover data themes are available for 11 datasets and 9 network services with varying coverage from the entire country to smaller regions. Data is both vector and raster (depending on theme). Update is on an as required basis. |
| | Geology and Soils | Geology falls under the remit of the Agency for Geology and Mineral Resources, responsibility for the Soils theme is with the Agency for Land Relations and Cadastre with State Land Planning Institute. Geological data is available as 5 datasets; Soils theme has 5 datasets and 5 network services. Coverage is 100%; data is available in vector and raster formats. Update is on an as required basis. |
| | Physical Infrastructure | According to the legal framework, this is the responsibility of the local public authorities (LPA's). The data is available as 10 datasets and 8 network services in vector format. Six of these datasets are from Chisinau municipality. Coverage is limited to certain urban areas. Update frequency is as required, and it is not standardized. |
| | Water | Hydrography is the responsibility of the Ministry for Agriculture, Regional Development and Environment/ Agency "Waters of Moldova". Data is available as 2 datasets with network services. Data format: vector. The Rivers coverage is 100%. Data is available in vector format; Update frequency is as required. |
| | Ortho-imagery | This is the responsibility of the Agency for Land Relations and Cadastre. Currently there are 7 datasets available, and all have view services. Coverage is 100% (excluding Transnistria). Update frequency is as required, no standard update cycle. Norwegian Government financed data acquisition and production of a nationwide orthophoto and DTM in 2007, 2011, 2015-2016. |

*Table 1: Fundamental Themes - Data Audit Summary*

## 3.5 Innovation




This strategic pathway recognizes that innovation has the potential to stimulate, trigger and respond to rapid change, leapfrog outdated technologies and processes, and to bridge the geospatial digital divide. Technology is continually evolving, creating new opportunities for innovation and creativity.

The objective is to leverage the latest cost-effective technologies, innovations, and process improvements so that governments, businesses and academia, no matter their current situation, may leapfrog to modern geospatial information management systems and practices.

## Overview of Current Situation

The current situation regarding this Strategic Pathway is that there are examples where innovation is being used and continues to be used, in support of geospatial activities. However, this innovation tends to be done on an individual basis by individual stakeholders or private sector and does not represent a coordinated approach on behalf of the government. While there is no geospatial or SDI specific innovation group or innovation laboratory, Moldova does have the National Agency for Research and Development [28]. This Agency provides for research, innovation and development generally and is available for specific sectors. Of particular relevance to the National SDI is the Technology Working Group[29]. This WG has responsibilities for the technical aspects of implementing the National SDI and falls within the remit of ALRC. However, there is no evidence that this WG is a conduit for research or innovation.

Moldova has a very well developed ICT infrastructure, which will facilitate the implementation of the National SDI. The geoportals are well established but there is no evidence of a national strategy for geospatial digital transformation. There is the national strategy 'Digital Moldova 2030'[30] published in 2018, which describes a number of sustainable development objectives, but the strategy does not specify geospatial data or services. There is no evidence of any formal investment for geospatial innovation projects or innovation hubs actively managing and communicating information. SE INGEOCAD is reported to be active in this respect. However, the feedback from INGEOCAD is that there is no formal program, but this may be planned in the future.

The institutional governing body in charge of a number of e-services in Moldova is the E Government Agency[31]. The Agency was established in 2010 and has a remit to transform government services through the application of ICT and this includes the modernization of services through re-engineering and digital transformation. While the work of E-Government is not directly linked to geospatial innovation, its strategic goals[32] will provide support for the implementation of the National SDI. For example, the MConnect platform provides for interoperability between information systems and currently includes linking cadastral information from the Agency for Public Services with information from Real Estate Registry.

There are examples of innovative projects provided by individual stakeholders:

- Geospatial applications for territory management and services provided by Orghei City Hall,
- Publication of covid dashboard[33] provided by the Ministry of Health in collaboration with the private sector,
- BeeProtect.md[34], again a collaboration between public sector and private sector, and
- Provision of thematic data offline - a further collaboration between the public sector[35] and private sector[36].

Despite this good work, the feedback from stakeholders is that funding for innovation should be a government initiative and not dependent on the initiatives from individual agencies or private sector. The need for an appropriately funded innovation program is widely recognized as being desirable.

[28] https://ancd.gov.md
[29] https://www.legis.md/cautare/getResults?doc_id=120942&lang=ro
[30] https://moldova.un.org/en/15729-national-development-strategy-moldova-2030-approved-government
[31] https://egov.md
[32] https://egov.md/en/about#affix-target-1
[33] https://gismoldova.maps.arcgis.com/apps/opsdashboard/index.html#/d274da857ed345efa66e1fbc959b021b
[34] Available to the public from end of 2021
[35] icas.com.md
[36] http://proiect-paparuda.lightcyphers.biz/#7/46.989/28.448

### Strengths

Moldova has a very good ICT infrastructure, and this is widely available, the mobile/Internet networks are reported to be of a good quality and inexpensive.

The various geoportals are well established, provide a good service and some of these provide public as well authorized access.

National Agency for Research and Development provides an environment for research and innovation, undertakes the evaluation of proposed projects, provides financial management for approved projects, and monitors the implementation of the projects.

Private and public sector collaboration has produced some innovative solutions.

### Weaknesses

There is a lack of a coordinated approach to innovation and there is no individual group tasked with innovation and having responsibility for innovation. Moldova is also missing a geospatial innovation strategy. There is no evidence provided related to geospatial research programs, and no 'center of excellence' to help focus geospatial research.

## 3.6 Standards


This strategic pathway establishes and ensures the adoption of best practice standards and compliance mechanisms for enabling data and technology interoperability to deliver integrated geospatial information and location-based knowledge creation.

The objective is to enable an efficient and consistent approach for different information systems to be able to discover, manage, communicate, exchange, and apply geospatial information for a multitude of uses, improved understanding and decision-making.

### Overview of Current Situation

The current situation regarding this Strategic Pathway Standards is, based on the Law 254 from 2016 and is strongly aligned with EU INSPIRE Directive. National data standards and technical specifications have been defined for the geospatial domain. Initiatives have been taken to establish a community of practice to share skills, knowledge, and experiences about the implementation of standards. Additionally, Moldova is nationally represented on the international Standards Development Organizations, such as ISO and CEN.

However, there is still no strong approach for different existing information systems to be able to discover, manage, communicate, exchange, and apply geospatial information for a multitude of uses, improved understanding and decision-making. So far, the adoption of best practice standards and compliance mechanisms for enabling data and technology interoperability is still rather limited. E.g., see the poor standards leadership, no execution of standards needs assessment, no National Standards Strategy, no active standardization awareness program, and no proper system of compliance in use to ensure that organizations are correctly implementing nationally or internationally endorsed standards.

### Strengths

The main strong points refer to the endorsement of some relevant technology and data standards to support interoperability and partly enable relevant information systems and diverse data types to work together conform INSPIRE Implementing Rules; the formation of an initial standards community of practice; the engagement on the international Standards Development Organizations (e.g. ISO and CEN).

### Weaknesses

The most significant areas of weakness refer to the poor standards governance, no proper standards needs assessment, no standards strategy development, and poor standards awareness. The need to work on all these areas has been recognized by relevant stakeholders and actors. Another area of weakness refers to standards compliance as no system of compliance is in use to ensure that organizations are correctly implementing nationally or internationally endorsed standards. Each of these weaknesses are explained below.

In Moldova exists the Institute for Standardization of Moldova (ISM), which is responsible to ensure the access to the international standards. However, a specific Working Group focusing on geospatial standards is currently not operational.

So far, the national need for geospatial information management standards has not been undertaken, priorities have not been agreed or an on-going review process has still not established. However, the Government Decision on interoperability 683 from 2018 establishes a list of standards that need to be applied for relevant geospatial data themes and related services[37].

No proper standards strategy nor a process to review/develop and endorse a common framework of national data and technology standards has been established. The Government Decision on interoperability (GD683 from 2018) only states a list of standards to be used for relevant geospatial data themes and related services conform the INSPIRE Implementing Rules.

There is still no active awareness program that raises, advocates, and promotes the principles, values, needs and benefits of geospatial data and technology standards. However, most of the responsible public data providers are aware about standards they need to use. These standards are described in Government Decision 683 from 2018 on the interoperability of spatial data sets and services[38].

A generic policy only exists to regularly assess and validate organizational compliance. There is understanding of such a kind of system of compliance. But, for example some web services are created on the Open-Source software (i.e. GeoNetwork), which include configuring mechanisms for services, compliant with international standards (OGC, ISO etc.), meanwhile other services are created on a different basis (see e.g. commercial, local).

[37] https://www.legis.md/cautare/getResults?doc_id=108815&lang=ro

[38] https://www.legis.md/cautare/getResults?doc_id=108815&lang=ro

## 3.7 Partnerships


This strategic pathway establishes cross-sector and interdisciplinary cooperation, coordination and collaboration with all levels of government, the geospatial industry , private sector, academia, and the international community, as an important premise to developing and sustaining an enduring nationally integrated geospatial information framework.

The objective is to create and sustain the value of geospatial information through a culture based on inclusion, trusted partnerships and strategic alliances that recognize common needs, aspirations, and goals, towards achieving national priorities and outcomes.

### Overview of Current Situation

The current situation regarding this Pathway Partnership can be characterized as follows: Formal cross-sectoral cooperation, coordination and collaborations have emerged between public sector institutions to reduce duplication and costs in the delivery of their services. Public Private Partnerships are still underdeveloped. However, in the recent years, some private companies became more closely to this kind of collaboration. Few collaborations between public sector institutions and academia (Technical University of Moldova, State Agrarian University of Moldova, Tiraspol University and Environment College) have been successfully established. International collaborations on geospatial information management have been strongly initiated and are active and ongoing (see e.g. cooperation agreements with the Norwegian Mapping Authority and ALRC, Twinning project of the European Commission and ALRC, and Erasmus+ projects at Technical University of Moldova and Tiraspol State University. Finally, active citizen participation in geospatial information management where individuals and community groups are involved in geospatial information projects is still rather limited – but there are positive exceptions (see Orghei city and Open Street Maps).

### Strengths

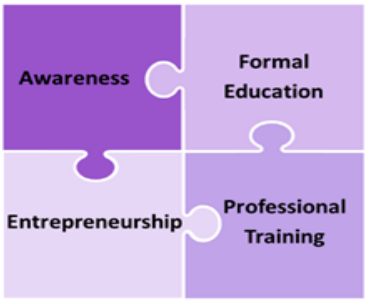
The main strong points refer to the emerging cooperation and collaboration amongst public sector institutions, the good cooperation between the public sector and academia, and the strong international collaboration. Now, cooperation between ALRC and other government institutions, academia and civil society as regards data sharing occurred in accordance with relevant agreements (including the Law on SDI). Representatives of academia sector are members of NSDI Working Groups and do actively participate at the NSDI events as workshops, conferences, round tables, and training. As described above, several international collaborations have been initiated and are active and ongoing (e.g. Eurogeographics, FIG, EUREF, EUPOS memberships, projects with the Norway Mapping Authority and European Commission).

### Weaknesses

The most significant areas of weakness refer to the rather low engagement to raise awareness around partnerships and opportunities; the low number of successfully Public Private Partnerships (PPPs)); rather poor citizen engagement in relevant geospatial information projects, and poor partnership management. Despite the general understanding of the benefits for collaboration, relevant

stakeholders are still not very engaged to strengthen the awareness as well as the management of partnerships and to involve the civil society participation in geospatial information projects. Moreover, the number of successfully implemented strategic partnerships and joint ventures between the public and private sectors that could deliver new or improved innovative geospatial products and services is limited.

## 3.8 Capacity and Education




This strategic pathway establishes enduring capacity development and education programs so that the value and benefits of integrated geospatial information management is sustained for the longer term.

The objective is to raise awareness, build and strengthen knowledge, competencies, skills, instincts, processes, resources, and innovative entrepreneurship that organizations, communities, and individuals require to utilize geospatial information for evidence based decision-making and effective service delivery.

### Overview of Current Situation

The current situation regarding this Strategic Pathway is that awareness about the benefits and value of geospatial information has been raised across key decision makers, institutions in government and across the education sector. A few courses at universities are offered to enhance a wider set of geospatial information management competences and skills required by the geospatial information sector workforce. Only a few, embryonic innovation programs are available in the country to stimulate entrepreneurship, but with mixed results. Finally, a very few technical and professional training, lifelong learning, internship development opportunities in geospatial information management are being provided to the relevant workforce to sustain geospatial information management capabilities by professional associations/bodies or more informal groups.

### Strengths

The main strong points refer to the general awareness that raises, advocates and promotes the principles, values, needs and benefits of geospatial information (see e.g. the NSDI-Working Group on Capacity and Education, ALRC workshops/seminars).

### Weaknesses

The most significant areas of weakness refer to the limited outreach awareness, no national competences inventory, no assessment on priority areas for capacity development, no relevant Capacity Development and Education Strategy, no formal tailored education, no proper professional development approach, no established innovation programs that stimulate entrepreneurship, and no embedding of geospatial literacy in schools. Each of these weaknesses are briefly explained below.

The number of outreach awareness programs that raise, advocate and promote the principles, values, needs and benefits of geospatial information is still rather limited. In the context of the EU Twinning project, ALRC executed several outreach initiatives, including online courses, use cases. In addition, universities have organized several GIS seminars, conferences and extra curricula courses.

No national inventory of knowledge, skills, and resources associated with geospatial information management had been produced. Such an inventory is a requirement to critically examine the capacity development and education policies, programs, and resources (technological, financial, and human) that are currently in place.

Despite the awareness that priorities are required, no sound assessment has been conducted to understand the priority areas for capacity development such that geospatial information management can be strengthened and sustained in the longer term.

In addition, there is no Capacity Development and Education Strategy and associated action plan that sets out how capacity development and education programs will support the strengthening of integrated geospatial information management. The Working Group on Capacity and Education has expressed the need for establishing such strategy.

The formal basic educational courses offered at the universities are not tailored to the current demands from the stakeholders. Many Stakeholders reported that they are required to invest in capacity building for their own staff for which resources are not always available.

Only a very few professional development opportunities in geospatial information management are provided by professional associations/bodies or more informal groups. So, the necessary human resource elements of professional training, lifelong learning, internship opportunities and/or continual technical and professional development available to the workforce to sustain geospatial information management capabilities is limited.

There is little evidence of government support to stimulate entrepreneurship through innovation programs and geospatial challenges that grow the capabilities of the business sector to develop products and services that are underpinned by geospatial information.

Finally, only a few primary and secondary schools have running pilots to test how geospatial literacy can be embedded into some core courses, but with mixed result.

## 3.9 Communication and Engagement


This strategic pathway recognizes that stakeholders are integral to the implementation of integrated geospatial information management systems and that their buy-in and commitment is critical to success.

The objective is to apply effective, efficient, and transparent communication and engagement methods to enhance and deepen participation and contributions from all stakeholders and at all levels.

### Overview of Current Situation

The current situation regarding this Strategic Pathway Communication and Engagement is that not many effective, efficient and transparent engagement methods have been well applied to strengthen the stakeholders' participation and contribution to the further implementation of the Moldova NSDI. Despite that there is strong stakeholders awareness about the need to invest in strong communication and stakeholders engagement, no much efforts have been undertaken to clarify the communication governance, to establish an agreed engagement strategy, to build a dedicated communications team, to set up a specific communication plan, to assemble a database of case studies, to strengthen the link

between the National SDI and the UN Sustainable Development goals, and to monitor and evaluate the effectiveness of engagement and communication about the SDI development. In addition, the stakeholder's engagement is ongoing, but is not very active and does not cover all the relevant stakeholders groups. The consequence of this all is that stakeholders are not fully informed about all the significant efforts recently made regarding the strategic pathways Governance & Institution, Policy & Legal and Financial.

### Strengths

The main strong points refer to the messages that convey the economic and societal value of SDI have been widely discussed and that the stakeholder engagement is ongoing.

### Weaknesses

The most significant areas of weakness refer to the weak communication governance, no agreed engagement strategy, no fully dedicated operational communications team, no detailed communication plan, the rather passive engagement of stakeholders, the partially populated database of case studies, the weak link between the National SDI and the UN Sustainable Development goals, and no evidence of an operational engagement and communications monitoring and evaluation framework. Each of these weaknesses are briefly explained below.

ALRC as the Governing Body is taking initiatives to better clarify the understanding of the full range of current and potential stakeholders including users. So far, ALRC focus was on the central public authorities. The latest developments refer to establish PPPs with the few of public companies in order to involve them into NSDI as a third parties.

No agreed engagement strategy has been established to identify individuals and groups of stakeholders and their needs, to effectively communicate geospatial policy and benefits, and to develop constructive, collaborative and enduring stakeholder relationships.

ALRC, as the administrative authority for the National SDI, has a limited dedicated team available to support a communications and engagement strategy.

Although the need for establishing such a communication plan has been strongly recognized by the stakeholders, there is no evidence of a communication plan being defined, agreed, and implemented for the various stakeholder audiences.

Despite that the Law on NSDI clearly defines roles, responsibilities, and activities allocated to specific entities and stakeholders, not all stakeholders are fully engaged or work effectively.

There is database wherein a limited number of case studies are assembled. The Digital orthophoto, DTM and Line Maps supported by Norwegian Ministry of External Affairs through Norwegian Mapping Authority as a data resource, can be seen as a real "user story", since it is a widely used and reused data resource in Moldova. This data resource is used by all local government bodies, private companies, research institutions and other stakeholders. It is currently open for access to all (public access) through a WMS service with its own client or through a view service on the ALRC Geoportal www.moldova-map.md.

The link between the National SDI and the UN Sustainable Development goals in engagement and communication materials is weak but most stakeholders recognize the need to strengthen the link.

Finally, no framework is operational for monitoring and evaluating the effectiveness of engagement and communication about the SDI development. However, most stakeholders recognize the need for such a framework.

# PART 4: CONCLUSIONS

The aim of this Baseline Diagnostic Report is to summarize the status of the National SDI in Moldova as a basis for contributing to and informing the Action Plan.

The feedback from the stakeholders on the National SDI is positive and there is good support from across the stakeholder community for the implementation of the National SDI. Stakeholders generally are enthusiastic about making a success of the National SDI, very committed to this, and the stakeholder engagements were generally positive and the engagement provided in a good spirit.

The work of ALRC is particularly appreciated and resulted in positive feedback regarding its role and its commitment. The support ALRC provides to the stakeholder community generally, and to this study specifically, has helped to strengthen that appreciation.

However, not all stakeholders are fully aware of the progress being made. This was evident in terms of Governance and very evident in terms of Legal and Policy, and Finance. This lack of a full understanding or appreciation of the progress with the SDI suggests a lack of communication, or certainly a lack of appropriate communication, a lack of stakeholder engagement, or both. Feedback from the private sector was generally more critical (see 2.3) but always in a constructive way. There was much sincerity in wanting to help as, having a successful geospatial industry will provide many opportunities for the private sector and this is appreciated.

The figure below presents the Baseline 2019, Baseline 2021 and ALRC 2021 (used as a benchmark reference). Looking at the consolidated results for 2019 and 2021, there is reasonable consistency across many of the pathways. However, Legal and Policy, Data, Standards, and Communication show a decline in understanding, while Innovation and Partnerships show significant increase in understanding. Considering the scores allocated by ALRC, which has a deep understanding of the current situation, the stakeholder results show a marked fall-off in understanding about Governance and Finance and, to a lesser extent, Legal and Policy, and Standards. These variances are considered in a little more detail below.

| | ALRC 2021 | Baseline 2021 | Baseline 2019 | Baseline Variance |
|---|---|---|---|---|
| Governance | 68 | **53** | 53 | 0 |
| Legal and Policy | 42 | **32** | 43 | -11 |
| Financial | 33 | **18** | 14 | 4 |
| Data | 60 | **54** | 64 | -10 |
| Innovation | 46 | **44** | 20 | 24 |
| Standards | 43 | **33** | 46 | -13 |
| Partnerships | 49 | **43** | 35 | 8 |
| Education and Cap | 32 | **30** | 26 | 4 |
| Communication an | 35 | **32** | 41 | -9 |
| All Pathways | 45 | 38 | 38 | 0 |


Overall, the scores for the two baselines are consistent and, accepting that the emphasis during the period between these assessments has been focused on more serious issues, then perhaps this outcome is not unexpected. For the 2021 assessment the consolidated results from the contributing stakeholders is lower than might otherwise be the case. There are a number of reasons, which may have contributed to this.

Some stakeholders did not have a full awareness of the progress that has been made, and continues to be made, with the National SDI.

Stakeholders were not always aware of the range of issues associated with the implementation of the SDI and included in the DT. For example, some stakeholders are more familiar with Education and Capacity while others were more familiar with issues associated with Partnering or Innovation.

A further reason for the individual variances between 2019 and 2021 may be down to the fact of having different indicators resulting in different scoring measures. While the pathways have remained consistent there has been change to the indicators, hence a strict like for like comparison could be misleading.

Finally, the completion of the DT was a challenge for many stakeholders and this will be reviewed.

So, what does this mean? Although the scores between 2021 and 2019 are similar overall, our considered opinion is that the 2021 baseline does not fully reflect the progress that has been made. While some of the indicators may be overvalued, there is no doubt that some have been under-valued for the reasons outlined above. **A more dependable baseline may lie somewhere between the ALRC score and the score for the consolidated results**. Overall, given the limited resources available to them, our observation is that **ALRC is providing a valuable service and that the implementation of the National SDI is broadly supported and endorsed.**

Governance is good. The structure exists but leadership needs to be more active and visible. Effective leadership for this enterprise is considered essential. What is the most appropriate scheme of delegation for the implementation, and ongoing support, for the National SDI? What is the operating model for the National SDI? How will community, citizen, and private sector governance be embedded in the operating model? As is evidenced from the results of the baseline assessment, at the current time the operating model is very public sector centric. While the existence of the Law provides for a form of Governance framework, the nature of this framework was not always obvious to the various stakeholders. Feedback included comments such as the benefits of a National SDI not being fully understood and that the necessary support is not always provided or is readily available. While most of the stakeholders interviewed recognized the good work being carried out by ALRC, when it comes to ALRC having the authority to influence or motivate stakeholders this is an area, which is not clear or is not fully understood. The result of this ambiguity is that requests from ALRC risk being ignored or risk not being afforded sufficient priority. This suggests that the authority of ALRC is not fully understood across all stakeholders. Indeed, does ALRC have this authority? This could be addressed through establishing a Leadership team with a clear mandate for the implementation of the National SDI.

Why is this important? The issue of Governance is particularly important for establishing and applying the parameters within which the National SDI services will operate. This will include determining service level engagements across a number of areas (described in Articles 8-13 of the Law), what level of variation between service levels will be acceptable, who determines this, and how will these service levels be applied and monitored? Is this intended to be within the remit of ALRC? If so, is this remit clearly understood and supported across agencies from both the public sector and the private sector?

The lack of a geospatial strategy needs to be addressed. An appropriate strategy would help consolidate the Institutional arrangements provided for in the NSDI Law and help connect the National SDI to other government policy priorities. This would provide structure and direction on where to focus effort and would support the transition from the current situation, which is very dependent on personal relationships, to a more coordinated and regulated arrangement, which, in turn, would help, support and contribute to a national action plan.

During the implementation of the National SDI there needs to be greater clarity on what decisions require approval at the Council level and what decisions can be progressed at the service delivery level, i.e. the coordinating authority role being fulfilled by ALRC. The Law provides a clear strategic view of areas such as Service Collaboration, Data, Interoperability and such like, together with a set of principles that senior leaders are bought into. This provides a good 'technical' framework for the implementation of the National SDI where exceptions would be through Council level agreement. However, in the absence of an active Council there needs to clear ownership of the 'operating model' by a Leadership team which is visible, engaged, and pro-actively committed to implementing and maintaining a senior level approach to prioritization and decision making. If this is ALRC then it must be evident to all stakeholders. This could be supported by investing in the existing Working groups to make them more pro-active.

The situation in Moldova regarding Legal and Policy is particularly good and yet consistently yielded low scores across the stakeholder community. The Law supporting the National SDI is a great advantage to what is being promoted, and yet there is a significant negative variance in the 2021 stakeholder assessment when compared with the 2019 assessment and with the ALRC scores. One outcome from this study is a recognition that the NSDI Law represents a real plus and the lack of understanding of what this represents, and the advantages and benefits it provides, is purely a communication issue. This could be addressed very easily through a suitable stakeholder communication and engagement plan (more on this in recommendations).

Finance represents a dichotomy. Moldova has been very successful at securing external investment to support its SDI initiative however there is a demonstrable lack of leadership in securing internal investment. External investment is good, but it is highly dependent on external donors maintaining their commitment and this represents a risk. Securing the necessary internal investment to facilitate the implementation and ongoing support of the SDI initiative should be one of the priorities. Considering this more broadly, from the perspective of the private sector it is reported that at present there is no sustainable business model based on data associated with the National SDI programme. While reference data is readily available, it was reported that initiatives to provide enhanced data based on pricing via a basic plan, standard plan, premium plan, enterprise plan method has failed. The reason provided is that this model is dependent on the provision of bulk data and, it was reported, at present there is no market for bulk data. Another key factor is that the private sector needs to know the 'rules of the game' i.e. no surprises. It was reported that there needs to be clarity and certainty on how the data can be used and what are the limits on this use. The rules need to be clear and NOT applied retrospectively (this is a sensitive issue!). This depends on the Decision makers having a good understanding of the needs of the private sector and, until the private sector has this confidence, then this will remain a barrier.

Data is good. The fundamental geospatial and statistical data holdings are well organized and mainly conform to the UN-GGIM recommended fundamental themes. However, more attention needs to be applied to data quality as not many fundamental datasets are managed according to an authorized data quality plan which would assure a certain level of data quality or that the data is fit-for-purpose.

Innovation scored very strongly compared to 2019. This was a surprise as much of the innovation appears to be driven by the private sector. The Council should consider the implementation of a Centre of Excellence (CoE) tasked with innovation in the field of geospatial. A suitable CoE can provide specialist and strategic support to those responsible for the delivery of the National SDI. A CoE can help support the development of geospatial strategy and help implement and embed government policies as the government develops its operating model and ways of engaging with the private sector. Resources 'seconded' to such a CoE could help translate the needs of their individual agencies into functional requirements, which can be examined objectively, and without bias, (it is important that a CoE is seen to be impartial). CoE needs to be agency/service 'agnostic' and focused on developing best practice. This is needed to ensure a consistency of approach across the spectrum of the National SDI

as well as developing the relationships needed to develop a culture of innovation and collaboration. Additionally, leading on technical research and innovation a suitably mature CoE could investigate opportunities for commercializing some of the services provided through the National SDI. This should be in collaboration with private sector partners, would be some way into the future, but should be an aspiration.

Despite the constructive work completed on the implementation of the INSPIRE data specifications, standards scored somewhat lower compared to 2019. Interoperability at technical, semantic and organizational levels remains a problem with the consequence that a very limited number of datasets are exchanged across the country and that information systems operate in isolation from each other. More effort needs to be invested in standards leadership, active standardization awareness program, and a robust compliance system, to help ensure that organizations are correctly implementing nationally or internationally endorsed standards.

Partnerships is an area where some additional commitment is required. While the variance in the 2019-2021 baseline scores show a marked improvement, this could be improved even further through developing stronger relationships between the public and private sectors. Collaboration between public sector agencies is common and generally very well supported however, it was reported that securing collaboration or partnering agreements between the public and private sector is a challenge. A key issue identified by the private sector was the problem of attracting public sector investment. Achieving funding for prototyping or undertaking proof of concept work was said to be ‘challenging’. It was reported that there is a reluctance on behalf of the public sector to engage in prototyping initiatives as such prototyping is considered to be outside of what the state agencies consider to be 'normal' business. Such prototyping could fall within the remit of a CoE.

Despite the various ‘capacity’ initiatives outlined in Part 1 of this report, education and capacity is one of the weakest areas. This is despite the obvious commitment from the stakeholders from academia for the National SDI. While there are a number of generic courses related to geospatial, it was reported that there is still much reliance on internal (specialized) training to ensure that staff have the necessary competencies. It was reported that finding staff with the relevant competencies is difficult and that self (internal) training provides outcomes that are more predictable. It was also suggested that training that is more professional is required to encourage staff to maintain the necessary knowledge and skills, e.g. continual professional development/lifelong learning approach. However, this all takes time and significant resources.

There is a lack of suitable or appropriate stakeholder communication and engagement. This is important, as much of the progress, being achieved is not being sufficiently well publicized. There is a need for a communication and engagement strategy. It was reported that while there is excellent engagement with specific individuals within ALRC, these individuals have many other commitments and, therefore, the engagement can be intermittent. However, without these informal networks it was stated that it would be difficult to maintain awareness of what is planned or what is happening (for example reference the variance between the ALRC results and the consolidated results from stakeholder group regarding governance, policy and legal, and finances). The need for improved communication and engagement was a common reference from the stakeholders.

# PART 5: RECOMMENDATIONS

What follows are suggestions for immediate actions. These are intended to help with the immediate progress of the current implementation of the National SDI. Actions from individual pathways will be used as references in the preparation of the Action Plan

1. At an Operational level, establish a leadership team with a very clear mandate to drive the implementation of the National SDI, specifically the services described in articles 9-13 of the law. The leadership team must have the necessary authority to drive change, to establish and apply the parameters within which the services described in the law will operate, determining, implementing, and monitoring relevant service level agreements, defining the priorities and activities of the working groups, and establishing key performance indicators which will be used to monitor, evaluate, and report progress to the Executive. This team needs to be active and visible. Additionally, at an Executive level and longer term so perhaps outside the immediate scope of these 'quick wins', reconsider the composition of the NSDI Council.

2. Develop and implement a stakeholder communication strategy or, if such a strategy exists, review and reinvigorate the strategy with the objective of
    a. securing active stakeholder engagement (stakeholder commitment is vital to the success of this National SDI initiative)
    b. promoting the general provisions relating to NSDI contained in the Law
    c. describing how these provisions can be of benefit to the individual stakeholders
    d. communicating geospatial policy/strategy
    e. confirming/defining the role of ALRC, its responsibilities, and how these responsibilities will support and promote the work of the individual stakeholders
    f. engaging with the private sector

3. Identify priorities for the preparation of a National SDI strategy/geospatial strategy. The strategy should be linked to the National SDI operating model, support the strategic priorities/policy drivers, and provide a clear strategic view of data and service collaboration with a set of principles that senior leaders are bought in to. These principles will act as a decision-making framework.

4. Recognize the need for a suitable business model and commence the development of this:
    a. identify the budget needed to support the implementation of the National SDI
    b. identify options for how this will be funded, and
    c. re-state the potential benefits to be realized (a socio-economic analysis will be undertaken as part 2 of this current study)
    d. alignment of the National SDI with government policies

    The plan should include a roadmap for reducing the dependency on external donor support (continued donor funding may not be sustainable). In addition, the plan must identify or confirm which agency has financial responsibility and accountability for the financial management of the costs associated with the implementation of the National SDI.

5. Establish an operational Working Group on Standards to lead on dealing with issues related to Interoperability, Standards Needs assessment, National Standards Strategy, an active standards awareness program, and a national action plan for rolling out data standards and technical specification.

6. Promote an awareness and benefits of partnering, the types of collaboration/partnering available, and build a longer-term strategy for partnering investigate the benefits to be gained through the promotion and implementation of Public Private Partnerships (PPPs) aimed at delivering new or improved innovative geospatial products and services.
7. Recognize the need to strengthen human capacity in order to make the geospatial information management more effective and sustainable by raising awareness of the benefits and values of geospatial information management across civil society (including schools, private companies, public institutions), co-designing tailored courses and program curricula at universities and investing/ promoting more in professional training, lifelong learning, internship opportunities and/or continual technical and professional development.

# ANNEX 1: KEY ORGANIZATIONS / STAKEHOLDERS

| Organisation | Contact Name | Title |
|---|---|---|
| Agency for Land Relations and Cadastre | Maria Ovdii | Head of Department for Geodesy, Mapping and GIS |
| | Pavel Ivancenco | Superior consultant of Department for Geodesy, Mapping and GIS |
| Agrarian State University of Moldova | Rodica Sîrbu | Lecturer |
| Ministry of Agriculture, Regional Development and Environment | Alexi Boșneaga | Acting Head of Spatial Planning Department |
| | Ion Amariei | Principal Consultant |
| | Serghei Severin | Superior Consultant |
| | Marina Ciobanu | Superior Consultant |
| Technical University of Moldova / Union of Geodesists, Geologists, and Cadastral Engineers | Andrei Iacovlev | Lecturer / Vice-President of Union of Geodesists, Geologists, and Cadastral Engineers |
| Agency for Public Services | Ala Chetraru | Head of the Geoinformation Systems |
| Orhei City Hall | Igor Cernei | Principal Specialist in Information Technologies |
| SE The State Planning Insitute for Land Management | Alexandr Radov | Manager for the development of geoinformation and communications technology |
| E-Government Agency | Olga Tumuruc | Data Exchange and Interoperability |
| National Bureau of Statistics | Pavel Tîtu | Serviciul Sisteme Informa?ionale Geografice |
| General Inspectorate for Emergency Situations | Adrian Macari | GIS Specialist |
| SE INGEOCAD | Nicolae Craciun | Geographic information system (GIS) |
| Municipality of Chisinau | Igor Cristal | Head of Department for Land Relations |
| Agency for Geology and Mineral Resources | Boris Iurciuc | Head of Geology Geodata Fund |
| Energy Efficiency Agency | Manole Balan | Head of Policy Implementation and Monitoring Department |
| Military Topographic Service | Ghenadie Spatari | Head of Geographic Information Systems Service |
| Royal Map (Private Company) / Water Supply Chiusinau | Eugen Cepoi | Manager |
| Lightcyphers (Private Company) | Anatol golovco | Manager |
| College for Ecology | Ludmila Ciugureanu | Lecturer |
| Congres of Local Public Authorities | Alexandru Morcov | Expert |