Spatial data infrastructure (SDI) is a framework for collecting, storing, managing, and distributing spatial data. It is a critical component of any modern geographic information system (GIS) and is used in a wide range of applications, including land management, environmental monitoring, and emergency response. One important aspect of SDI is the legal component, which includes the laws and regulations that govern the collection, use, and sharing of spatial data. These laws and regulations can vary depending on the jurisdiction and can include issues such as data ownership, privacy and intellectual property rights. In the Republic of Armenia, with the concept of “Integrated Cadastre”, it is planned to implement and develop a National Spatial Data Infrastructure (NSDI). Nevertheless, in the Republic of Armenia, not all stages of the implementation of NSDI have been developed yet, including a legal document defining the availability of data at different levels. For the implementation and effective policy development of NSDI, it is necessary to give attention to the regulation of legal relations regarding spatial data at different levels. For this purpose, we studied the legal documents related to the regulation of the field of spatial data in the Republic of Armenia, identified the contradictions and problems in the existing legal documents, which made it possible to highlight the necessary relevant legal provisions.

Key words: geospatial data; NSDI and SDI; geodata access; legal aspect

Introduction
According to the RA Government’s decision “On approving the concept of creating an Integrated Cadastre and the program of measures arising from the concept” (2019), it is planned to develop a NSDI standard in Republic of Armenia. It is planned to be developed on the basis of the existing EU INSPIRE directive and to be partially supplemented by existing spatial metadata already borrowed or localized, with prior editing and integration. In accordance with the INSPIRE Directive, an infrastructure for spatial information means “metadata, spatial data sets and spatial data services, network services and technologies, agreements on sharing, access and use, and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with the Directive”. The legal, institutional, and governance aspects of a NSDI are crucial for ensuring the proper management, use, and sharing of spatial data within a country. This includes establishing legal frameworks for data collection and distribution, creating institutional structures to manage and maintain the NSDI, and implementing governance mechanisms to ensure the proper use of the data. Without proper legal, institutional, and governance aspects, the NSDI may not function effectively and may not be able to provide the necessary data for decision-making and planning [Erskine et al., 2013]. Additionally, without clear legal and governance frameworks, there may be confusion about who owns and can access the data, which could lead to issues with data quality and integrity. Overall, legal, institutional, and governance aspect is an essential component of a functional and effective NSDI. The legal component of a NSDI is of paramount importance, which is why we have conducted extensive studies to understand its implications and ensure compliance with existing regulations. These studies have helped us develop a robust legal framework for data collection and distribution, and ensure that our NSDI operates within the bounds of national laws and regulations. Additionally, by understanding the legal considerations for NSDI, we have been able to anticipate and mitigate potential legal challenges that may arise in the future. Furthermore, the legal component of NSDI also helps to protect the rights of data providers and users, and ensures that spatial data is used for legitimate and authorized purposes. Overall, our studies on the legal component of NSDI will play an important and significant role in ensuring the proper management, use, and sharing of spatial data within our country.

Aim
The purpose of studying the legal component of NSDI in Armenia is to ensure that the framework for the NSDI is in compliance with relevant laws and regulations. This includes understanding and addressing any legal barriers or challenges that may arise during the development and implementation of the NSDI, such as issues related to data privacy, intellectual property, and access to information. Additionally, studying the legal component of NSDI can help to establish the legal foundation for the management and governance of the NSDI, which is essential for its long-term sustainability and success.
Methodology

The methodology for studying the legal aspect of the NSDI in Armenia had involved several steps:

- Literature review: Reviewing existing literature on the legal aspects of NSDI, including international and regional standards, laws, and best practices.
- Legal gap analysis: Identifying and analyzing the existing laws, regulations, and policies related to NSDI in Armenia to identify any legal gaps or inconsistencies.
- Stakeholder consultation: Consulting with relevant stakeholders, including government agencies, private sector, civil society organizations and academics, to gather their perspectives on the legal challenges and opportunities related to NSDI in Armenia.
- Drafting of legal framework: Based on the findings of the above steps, drafting a legal framework for the NSDI in Armenia that addresses the identified legal gaps and aligns with international and regional standards and best practices.
- Review and validation: Reviewing and validating the draft legal framework with relevant stakeholders to ensure that it is comprehensive and practical.
- Implementation and monitoring: Finally, implementing and monitoring the legal framework for the NSDI in Armenia to ensure its effective and efficient functioning.

Results

The legal framework of spatial data management includes the legal relations related to the collection, storage, processing and provision of spatial data, the definition of their access levels and access restrictions.

Below are presented the legal acts in RA identified during the research, the main purpose of which is to regulate the field of RA spatial data:

- RA Law on “Geodesy and Cartography”.
- Legal act on “Approving the procedure for obtaining a permit for using topographical and geodetic materials and data containing state and official secrets”.
- Legal act on “Approving the concept of creation and management of the RA geographic information system”.
- Legal act on “Approving the procedure for the creation, maintenance and provision of information of the RA state cartographic and geodetic fund”.
- Legal act on “Approving the composition, design and management procedure of RA spatial data information infrastructure”.
- Legal act on “Providing information on newly created spatial data and objects containing topographical elements of RA”.

In the framework of the research, it became clear that the principles and limitations of the use of spatial data in the Republic of Armenia are not fully regulated by the aforementioned legal acts. The problem is more significant in the case of the creation of the RA NSDI, as the need to define different levels of access to the use of spatial data arises.

The current situation of the use of spatial data in Armenia is briefly presented in Chapter 3, Sub-chapter 2 of the legal act “On approving the strategic plan for the creation of an Integrated Cadastre”. According to the mentioned sub-chapter, “The authority of state administration bodies to collect or create spatial data is regulated by the normative and legal acts in force in the Republic of Armenia” (e.g. “Land Code of the Republic of Armenia”, “Water Code”, RA law on the Subsoil, RA law on Local Self-Government, etc.). The mentioned governmental bodies carry out spatial data exchange with other spatial data structures and regularly provide and receive fresh data as needed. However, it is noted that significant data is also provided by government request and some of it is on a paid basis or is simply provided based on an interpersonal arrangement (Chapter 3, Sub-chapter 2). In the same legal document, it is also mentioned that the legal component is considered the weak point of NSDI creation (Chapter 3, Sub-chapter 3).

The fact that the legal document approved by the Government of the Republic of Armenia also states that the exchange of spatial data in state administration bodies is carried out on the basis of “interpersonal agreement” is the most significant here. It clearly describes that there are legal gaps in the field of RA spatial data management, because interpersonal agreements document the non-legal nature of the process of providing and using spatial data.

The next main problem and feature, which was identified during the research, is the inconsistencies in the existing legal documents. Extant legal documents include various lists of base spatial data layers. There is a need to clarify the list of RA base spatial data layers.

The problems become more characteristic as a result of the study of the international experience of the legal framework of spatial data management. As a result of the localization of the EU “INSPIRE” directive, states are generally starting to pursue an “Open Data” policy. However, in order to avoid further problems, developed countries attach great importance to the effective implementation of the legal framework related to spatial data. The Republic of Germany has both digital and electronic spatial data access laws [Loenen and Kok 2004]. These laws clearly define the access to spatial data, spatial data services and metadata for agencies maintaining spatial data in the German Federation, as well as the legal framework for the use of these data and services. In the US, regardless of the open data policy, there is a NSDI Management Act that defines the levels of access to spatial data [Loenen and Kok, 2004].

Summarizing the studies of the main legal issues related to spatial data in RA, three areas of coverage of the issues were distinguished:

- Property rights issues: Copyright in spatial data sets, topographic and thematic maps and cartographic materials.
- Issues related to privacy protection: Spatial data limited management and access policy.
Responsibility: Legal responsibility for spatial data quality, liability contract issues, crimes and torts, limited spatial data recovery strategies, etc.

Taking into account the Integrated Cadastre strategy, the successive steps of the strategy and the features of the NSDI, we propose to develop at least the following legal documents for the successful launch of the NSDI:

1. Drafting and adoption of the NSDI Law.
2. Clarification of the legal framework for the activities of the NSDI Council and creation of a Working Group on legal issues to consider topics.
3. Drafting and adoption Data Sharing Agreement or legal act.

The NSDI Law should include provisions for Metadata, Spatial Data and Services Interoperability, Data Sharing and Management, Network Services and Sector Financing.

The Data sharing agreement or legal act should clearly define the rights of the Interested Parties, the notification procedures of the agreements, the publication requirements, the compliance with the provisions of the INSPIRE Directive and the implementing rules.

Practical significance
The practical significance of studying the legal aspect of the National Spatial Data Infrastructure (NSDI) includes several key benefits:

- Compliance: Ensuring that the NSDI is in compliance with relevant laws and regulations, including data privacy, intellectual property, and access to information laws. This can help to protect the rights of individuals and organizations, and prevent legal challenges and disputes related to the NSDI.
- Governance and management: Establishing a legal foundation for the governance and management of the NSDI, which is essential for its long-term sustainability and success. This includes establishing the roles and responsibilities of different stakeholders, and the legal framework for decision-making and oversight.
- Access to information: Facilitating access to spatial data and information, which is essential for informed decision-making and effective management of natural resources and public services.
- Innovation and development: Encouraging innovation and development in the field of spatial data and information management by providing a legal framework that supports the development of new technologies, applications, and services.
- International cooperation: Facilitating international cooperation in the field of spatial data and information management by aligning the legal framework of the NSDI with international and regional standards and best practices.

Conclusions
For the general regulation of the legal component of NSDI, it is proposed to develop legal documents regarding the spatial data infrastructure. In particular, it is proposed to regulate the following issues by legal act and define the principles and provisions presented below:

- To clarify the concepts and definitions included in the legal acts in force in the Republic of Armenia to date, as well as to correct the inconsistencies in the existing concepts and their definitions.
- Define the principles of managing the National Spatial Data Infrastructure in RA.
- Include application rules that define technical methods for ensuring interoperability of spatial datasets and services.

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