




Standard Operating Procedure for Geographic Information Categorization & Identification of Single Source of Truth

National Spatial Data Infrastructure

Centre for Geo-Information
National Land Commission Secretariat
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STANDARD OPERATING PROCEDURE FOR GEOGRAPHIC INFORMATION CATEGORIZATION & IDENTIFICATION OF SINGLE SOURCE OF TRUTH

National Spatial Data Infrastructure

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Background

Introduction

In the present era of data-driven decision-making, Geographic Information Systems (GIS) take a leading role, furnishing extensive spatial information with wide-ranging impacts from urban planning to environmental management. As organizations increasingly depend on geographic data for crucial decision support, the need for well-organized and consistent data management becomes crucial. Despite the government, corporate and private entities in Bhutan generates substantial geospatial data and its utilization is constrained within individual agency due to a lack of clear guidelines and operational procedures for effective management and sharing. Recognizing the necessity of a defined approach to data management and sharing, the Royal Government of Bhutan implemented the Geo-Information Policy (GI Policy) in 2018. Anchored in fundamental principles of availability, accessibility, reliability, and affordability of geospatial data, the policy mandates data producers to classify geospatial data into Open, Common, and Restricted categories and emphasizes the establishment of a Single Source of Truth (SSOT) for geospatial data. This categorization will facilitate improved data-sharing practices for non-sensitive information and assist government agencies in identifying sensitive information and data whose access needs to be protected. The SSOT will ensure each data has a designated owner for creation, maintenance, and updates of data thereby promoting data authenticity and accuracy.

Purpose of Standard Operating Procedure (SOP)

The following are the purposes of SOP

- i. Categorize the geospatial data into open, common, and restricted categories as per the GI policy
- ii. Identify the single source of truth for the geospatial data
- iii. Establish the procedures for geospatial data classification and identify the SSOT

Goals of the SOP

The SOP will achieve the following;

- i. Categorize and identify the SSOT for all the geospatial data
- ii. Maintain consistency in categorizing and identifying the SSOT
- iii. Promote the single-time creation and multiple-time use of geospatial data through the identification of single source of truth for a particular data.
- iv. Enhance the data-sharing practice for open data

Scope of the SOP

The provisions of this SOP shall apply to all geospatial data received, produced, or managed by all the government, corporate, and public entities regardless of its source, form, or nature. This shall include all the spatial data and its attribute information produced in either a digital or paper-based format. The SOP shall be applied while categorizing the geospatial data as per the GI Policy, and while defining the SSOT for existing as well as for new geospatial data.

General Principles of Data Classification and SSOT

GI Data Classification

Data Classification Levels

As per clause 6.3.1 of the GI Policy 2018, geospatial data should be classified into three categories viz open, common, and restricted. The description of the classification levels is as mentioned below;

i. Open data

Open data can be disclosed to the public without any restriction. This data type does not require any security controls when used or stored. The open data shall be made available to the public domain through any data-sharing platform.

ii. Common Data

Common data will be freely exchanged among government agencies and academia, while corporate and private entities may incur associated costs depending upon the agreement between the data producer and the consumer. Such data shall be shared after filtering the sensitive contents in confinement with the interest of the data-producing agency.

iii. Restricted Data

Restricted data are those which can be shared only among authorized agencies. The authorized agency shall be determined by the respective data-producing agencies.

Access Control

Access control pertains to determining the degree of accessibility of data, based on the different data classification levels. The following table shows the extent of accessibility corresponding to various classification levels of geospatial data.

Table 1: Level of Access

Type of Data	Accessibility	Cost	Availability
Open	The Data with metadata are freely accessible to the public for both viewing and downloading without any restriction.	No charges are applied for accessing or using the data.	Data is published on open platforms and repositories for public discovery-usage.
Common	The data with metadata shall be accessible to the public for viewing. As for downloading, the users shall contact the relevant data owner.	A reasonable charge may be levied for corporate and private organizations based on the agreement between the data owner and the consumer.	Data shall be published in any open data sharing platform explicitly for viewing purposes.
Restricted	The metadata shall be accessible to the public whereas the data shall be shared only among the authorized agencies.	No charges are applied.	Data shall not be published in any open data sharing platforms. Organization that produces the data shall decide on the appropriate physical and digital mean

of secure data sharing that ensure the minimization of potential risks and compliance with data management and sharing guidelines.

Data Classification Impact Assessment

The impact assessment would assist every data producer in classifying their data. Every data-producing agency should – on its own – conduct the impact assessment of unauthorized access or disclosure and the list below is considered non-exhaustive. The following table illustrates and specifies the appropriate classification level that would enable data producers to assess the impact level of unauthorized access or disclosure of the data or its content.

Table 2: Categories and Levels of Data Classification Impact Assessment

Main Impact Category National Interest		
Impact Sub-Category Kingdom's Reputation		
Considerations Is the information likely to attract attention from national or international media? Could it potentially create a negative perception?		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Reputation is immensely affected.	No impact on the kingdom's reputation after filtering the sensitive information.	No impact on the kingdom's reputation

Main Impact Category National Interest		
Impact Sub-Category Diplomatic Relationships		
Considerations Could the information jeopardize the relationships with other nations?		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Diplomatic relationships affected	No impact on diplomatic relationship after filtering the sensitive information	No impact on the diplomatic relationship

Main Impact Category National Interest		
Impact Sub-Category National Security		
Considerations If this information were made public, would it impose threat to the security of the nation or facilitate the commission of serious crimes?		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
The security of the nation is highly impacted	No impact on national security after filtering the sensitive information	No impact on the national security

Main Impact Category National Interest		
Impact Sub-Category National Economy		
Considerations Would this information, if disclosed, cause economic losses at the national level?		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Long-term effect on the national economy, with a decrease in GDP, employment rate, purchasing power, and other relevant economic indicators.	No impact on the national economy after filtering the sensitive information	No impact on the national economy

Main Impact Category Entity Activities		
Impact Sub-Category Profits of private and corporate Entities		
Considerations Would disclosure of this information lead to financial loss of corporate and private entities		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Impact on profits of the private and corporate entities.	No impact on the profit of private and corporate entities after filtering the sensitive information.	No impact on profit of private and corporate entities.

Main Impact Category Individuals		
Impact Sub-Category Health/Safety of Individuals		
Considerations Would the release of this information lead to the disclosure of the location and hamper the safety of individuals		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Impact on the health and safety of the individual leading to loss of life of an individual or group.	No impact on the health and safety of individuals after filtering the sensitive information.	No impact on the health and safety of individuals.

Main Impact Category Individuals		
Impact Sub-Category Privacy		
Considerations Would the release of this information lead to a violation of the privacy of individuals? Would it infringe any intellectual property rights		
Levels of Impact:		
High Impact	No impact after filtering the sensitive information	No impact
Restricted	Common	Open
Disclosure of the personal information of an individual.	No impact on the privacy after filtering the sensitive information.	No impact on the privacy.

Single Source of Truth

Clause 6.2.3 of the GI Policy 2018 states that, “the CGISC shall ensure a single source of truth identifying responsible agencies in producing fundamental as well as thematic GI data”. A single source of truth (SSOT) within the realm of Geographic Information management is a concept of assigning ownership of particular GI data to an organization/entity that is responsible for producing, managing, and sharing the most accurate, complete, and up-to-date data.

Benefits of SSOT

The following are some of the benefits of SSOT;

- i. Identify the most reliable source for a particular data
- ii. Eliminate unnecessary duplication in the collection and maintenance of data

iii. Promote data transparency and accountability

Roles and Responsibility of Data Owner

The agency that has been assigned with the SSOT for a particular set of data shall have the mandate to;

- i. Maintain and keep the data up to date
- ii. Make the data(open) and its metadata available to the public through data-sharing platforms
- iii. Assign a data admin within its organization with the task of maintaining and sharing the data

Procedures for GI data Categorization and Identifying SSOT

The following are the procedures that every data producer must follow for the categorization and identification of a Single Source of Truth.

Step 1: Conduct an inventory of all the GI data available with the agency

The first step to be taken by any organization is to prepare an inventory of all the data owned by the Organization.

Step 2: Identification of Single source of Truth

A agency shall be identified as a single source of truth

The agency:

- Has sole statutory responsibility for the capture and maintenance of the data
- Is the first entity to collaborate to record the changes and update the data

After taking into consideration the above criteria, the single source of truth for existing as well as new geospatial shall be decided. If the concerned agency does not fulfill the above set criterias then the agency shall not be the single source of truth for that particular data and further categorization process shall not be conducted. After fulfilling the above set criteria the agency shall be recognized as the single source of truth for that particular geospatial data and shall proceed with the categorization process.

Step 3: Conduct an impact assessment process

The agency that owns or produces the geospatial data shall follow the following steps while classifying the data.

Step 3a: Identify the impact category

The first stage of the impact assessment process is to identify the main and subcategory of the potential impact in any of the following main categories:

- National interest
- Entity activities
- Individual

Step 3b: Identify the impact level

The second stage involves assigning the impact level to all the impact categories. The impact level shall be defined in three levels;

- High impact: Access to or disclosure of such data shall cause serious long-term damages that cannot be recovered or rectified.
- No impact after filtering the sensitive information: If the data can be shared after filtering sensitive information and access to or disclosure of such data is unlikely to cause any long- or short-term damage.
- No impact: The disclosure of such data is unlikely to cause any long- or short-term damage.

Step 3c: Based on the identified impacts and their levels, the data-producing organization shall determine the data classification level:

- High impact: the data shall be classified as “Restricted”
- No impact on national interest, entity activities, and health or safety of individuals after filtering the sensitive: the data shall be classified as “Common”
- No impact on the National interest, Entity activities, and Health or safety of individuals: The data shall be classified as “Open”

A detailed description of the key considerations for each impact cat-

egory and level is outlined in Table 2 “Data Classification Impact Assessment Categories and Levels”. The data shall be classified under a restricted category if any of the above-mentioned impact categories falls under the high impact level.

Step 4 must be considered whenever the impact level identified is “No impact” or the particular data is classified under the open category. If a particular data is classified as restricted steps 4 and 6 shall be omitted and if classified as common step 4 shall be omitted.

Step 4: Identify relevant laws, acts, and policies (for Open data)

If the GI data is classified as open, the organization that produced the data must confirm whether the disclosure of such data would conflict with the Kingdom’s laws, acts, and policies (such as Land Act of Bhutan 2007). If such disclosure of data proves to be against the laws, acts, and policies, data shall then be classified as “Restricted” otherwise the organization must proceed to carry out Step 4.

Step 5: Submit the Data Categorization and SSOT form

After individual agencies classify the data, they are required to submit the data categorization and SSOT form attached in the Annexure 1 of this document. The submitted form shall be endorsed by the head of the agency or department which ever is relevant. The final form shall be submitted to the Centre for Geo-Information before publishing or sharing the data.

Step 6: Share or publish the data in the data-sharing platform

After data has been classified as open and ensuring that the data disclosure shall not imply any breach of any existing laws, acts, and policies the data-producing agency shall share such data with other

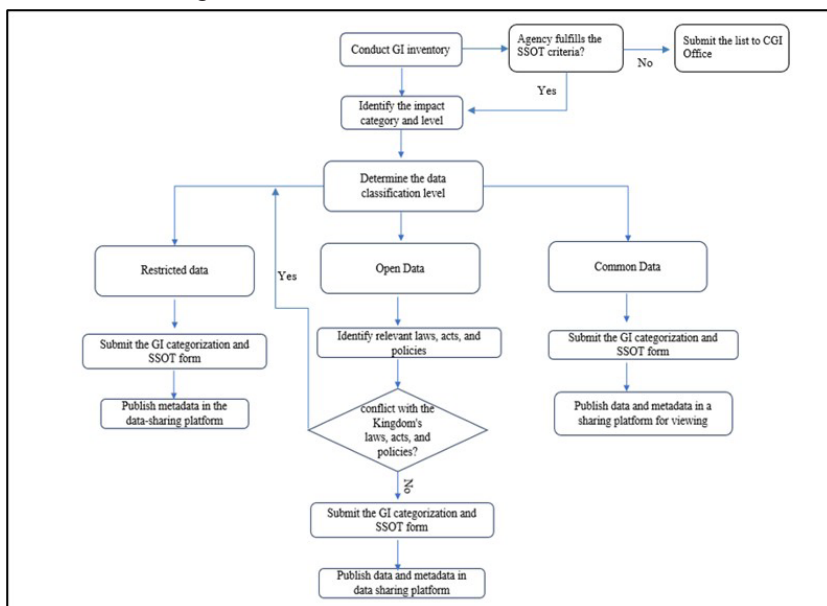
entities or make the data, metadata and the data product specifications public through any open data sharing platform. Data classified as common shall be made public in any data sharing platform for viewing purpose without the option for download.

Step 7: Publish metadata

If the data is classified as restricted the data publisher/owner shall apply appropriate controls to the data while its metadata shall be made available in any of the data-sharing platforms.

The classification process shall be assumed to be concluded when all the data owned by the entity is classified, its classification levels are verified, and the data, metadata, and the data product specification are shared or made available to the public through a data-sharing platform. The following flowchart shows the general procedure for the data classification.

Figure 1: Data Classification Procedure



Annexure 1: Data Categorization and SSOT Checklist Form

Name of the Data:		
Criteria:	Remarks (Yes/No)	
Has sole statutory responsibility for the capture and maintenance of the data	<input type="checkbox"/>	
Is the responsible entity to collaborate to record the changes and update the data	<input type="checkbox"/>	
Final Single Source of Truth:		
Impact Category	Impact Subcategory:	Impact Level
National Interest	Kingdom's Reputation	<input type="checkbox"/>
	Diplomatic Relationships	<input type="checkbox"/>
	National Security	<input type="checkbox"/>
	National Economy	<input type="checkbox"/>
Entity Activities	Profits of Private and Corporate Entities	<input type="checkbox"/>
Individuals	Health/Safety of Individuals	<input type="checkbox"/>
	Privacy	<input type="checkbox"/>
Would the disclosure of such data conflict with the Kingdom's laws, acts, and policies (Yes/No):		<input type="checkbox"/>
Final Data Category:		



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