CONTENTS

SINAR: A Tool Field Collection of Geographical Names 3
  5a.1 SINAR (Sistem Informasi Nama Rupabumi - Geographical Names Information System) 3
  5a.2 Field Collection of Geographical Names using SINAR 5
  5a.3 Web Platform 13
  5a.4 Future Development of SINAR 14
5a.1 SINAR (Sistem Informasi Nama Rupabumi - Geographical Names Information System)

The Geographical Names Information System, known as SINAR (Sistem Informasi Nama Rupabumi), is a vital tool for standardizing geographical names in Indonesia. Formerly, the standardization of geographical names in Indonesia was carried out manually, involving several tools for collecting geographical names, namely GPS handheld devices, cameras, sound recorders, and printed maps. However, in the mid-2010s, the collection forms for geographical names underwent a process of standardization, resulting in the development of a specific set of forms, namely Form A, Form B, and Form C. Form A served as a repository for the initial data provided by local or national authorities, whereas Form B constituted a detailed form designed for capturing information about individual geographical names. Lastly, Form C played a crucial role in data verification recapitulation.

In 2012, the Geospatial Information Agency (BIG) pioneered the exploration of novel methodologies for acquiring toponym data. This innovative approach leveraged open-source applications such as GPS Essential and Quantum GIS, aiming to optimize the efficiency and convenience of the data collection process.

The subsequent year, in 2013, a dissemination system was established via the website https://namarupabumi.org. The web platform served the crucial purpose of disseminating the geographical names collected throughout Indonesia.

Throughout the application of the manual method, BIG recognizes local government needs in the Geographical Names collection associated with natural features. BIG collaborated closely with a select group of experts and other members of the National Team for the Standardization of Geographical Names in 2014 to resolve the problem. This collaborative effort culminated in the development of a cutting-edge toponym data acquisition system known as “Topkit”. Topkit required a running GNSS RTK device to operate properly, a constraint that proved inconvenient during fieldwork operations. Topkit was integrated as an embedded application within the GNSS RTK receiver.

Building upon previous advancements, BIG embarked on the development of a digital geographical name collection application for Android and web-based platforms in early 2016. This application's primary objective, SAKTI (Sistem Akusisi Toponim Indonesia - Toponym Data Acquisition System), was to replace the requirement for multiple surveying equipment with a single device, thereby streamlining the data collection process. The SAKTI application encompassed functionalities such as GPS handheld capabilities, a camera, and a sound
recorder and facilitated access to printed maps within the Android-based data collection application.

In 2018 the early stage of SINAR development was initially designed only for disseminating Geographical Names data. The data collection and verification are performed through SAKTI in Android and web-based applications. In the same year, Indonesia conducted official training sessions to empower local authorities to effectively utilize the SAKTI application for data collection within their respective regions. This training initiative provided a valuable opportunity for BIG to receive feedback and further refine the application’s features.

Furthermore, in 2020, the SAKTI and SINAR system was integrated into SINAR as a single web-based and Android-based application for data collection, verification, and publication. The Android app was purposefully tailored for capturing geographical names data, with seamless synchronization of the captured data to the web-based platform for subsequent verification and standardization processes. The Android version of the application was readily accessible via the Google Play Store, while the web-based application could be accessed through the dedicated website: https://sinar.big.go.id/. It is worth noting that an iOS version of the application was not yet available at that time, but its development was under consideration for future implementation.

On January 6, 2021, the Indonesian government enforced Regulation Number 2 of 2021, which primarily addresses the standardization of geographical names (referred to as GR 2/2021). This regulatory measure prominently highlights the necessity of establishing a dedicated platform to facilitate standardization. SINAR is positioned to emerge as the foremost application for ensuring the standardization of geographical names within the country. It is a practical tool for collecting geographical names data, effectively streamlining the data collection process. The wealth of data housed within SINAR is easily accessible and extensively available to users while simultaneously employing robust security measures to safeguard against potential data loss or damage. All data is securely stored on the BIG server, supplemented by additional backup protocols implemented on remote servers. To summarize the development of the Geographical Names Information System in Indonesia, the following graphic illustrates its progression.
**5a.2 Field Collection of Geographical Names using SINAR**

**5a.2.1 Users**

User roles within SINAR are designed to align with the specifications outlined in Regulation Number 2 of 2021 on the Standardization of Geographical Names. These roles encompass a range of management features, ensuring efficient field collection of geographical names:

<table>
<thead>
<tr>
<th>No</th>
<th>User</th>
<th>User Origin</th>
<th>Login required?</th>
<th>View the Data</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Public</td>
<td>Public</td>
<td>No</td>
<td>Yes</td>
<td>Web</td>
</tr>
<tr>
<td>2.</td>
<td>Contributor</td>
<td>Public</td>
<td>Yes</td>
<td>Yes</td>
<td>Android and Web</td>
</tr>
<tr>
<td>3.</td>
<td>Surveyor</td>
<td>BIG, Local Government, Central Government</td>
<td>Yes</td>
<td>Yes</td>
<td>Android and Web</td>
</tr>
<tr>
<td>4.</td>
<td>Municipality Verificator</td>
<td>Municipality Government</td>
<td>Yes</td>
<td>Yes</td>
<td>Web</td>
</tr>
<tr>
<td>5.</td>
<td>Provincial Verificator</td>
<td>Provincial Government</td>
<td>Yes</td>
<td>Yes</td>
<td>Web</td>
</tr>
<tr>
<td>6.</td>
<td>National</td>
<td>BIG and Central</td>
<td>Yes</td>
<td>Yes</td>
<td>Web</td>
</tr>
</tbody>
</table>
This module will focus on the Contributor and Surveyor user categories to comprehensively explain the data collection process. Both categories are authorized to gather geographical name data in the field and perform data editing within the web platform. The Surveyor role necessitates a proposal from a certified user, typically a government representative, and a letter of assignment as supporting documentation. The role of surveyor must submit their letter of assignment via the web or Android platform and await approval from the administrator. Meanwhile, the Contributor user category does not require any specific procedural requirements.

5a.2.2 Database Structure

The primary structure of the toponym database serves as the foundational framework or organization within the SINAR application for the storage and management of geographical name data. The main toponym database structure is thoughtfully designed to ensure the efficient storage and retrieval of extensive geographical names data acquired through the SINAR application. This design likely incorporates diverse components, such as tables, fields, and relationships, which contribute to the systematic organization of the data.

Dedicated tables are likely responsible for housing critical information about geographical names within this structure. These tables may include fields to store the names themselves, location coordinates, associated attributes, and administrative divisions. Furthermore, supplementary tables might be integrated to accommodate metadata, encompassing data sources, collection dates, and quality assurance indicators. Specific details regarding the precise characteristics of the existing main toponym database structure are provided below:
5a.2.3 Application Flow

In order to enhance comprehension of this platform, it is essential to analyze the application flow for collecting geographical names on both the Android and web platforms. The following section provides a detailed overview of this process:
5a.2.4 Device Requirements

In order to utilize the Android-based application, the Android device must meet the following minimum criteria:

- Operating System: Android 6 (Marshmallow) or a newer version.
- RAM: At least 4GB of Random Access Memory.
- Minimum remaining memory: 1GB.
- Smartphone screen size is a minimum of 5 inches.

Moreover, the functionality of the Android app is influenced by various device limitations, including:

- Features that heavily rely on the device signal, such as online base maps, the number of Global Navigation Satellite System (GNSS) satellites captured by the device, GPS accuracy value, and elevation. A stronger signal reception leads to higher accuracy.
- Features dependent on the device type, such as the camera's picture quality and the voice recording's clarity.
- The duration required to upload and download master data from the BIG server depends on factors such as file size, device signal strength, and the server's condition.
On the other hand, to access the web-based application, the personal computer must meet specific requirements, which include:

- Recommended access through the Google Chrome web browser.
- RAM: A minimum of 16GB.
- HDD: At least 512GB of storage capacity.
- Processor: Minimum quad processor or better.
- Internet speed: A minimum of 50 Mbps.

5a.2.5 Application Features

Android Application

The Android application can be obtained from the Google Play Store by entering the keyword "SINAR Toponim" in the search box. The application will then be displayed as shown below.

![Figure 4. Installation of SINAR](image-url)
The application’s main page will be displayed immediately upon the user’s successful login or signup. The following image depicts the main page interface:

Figure 5. Main Page of SINAR Android
The side menu will be presented upon clicking this button, as depicted below.

![Side menu of SINAR Android](image)

Figure 6. Menu of SINAR Android

In order to collect data, users can click on the button located on the main page, which will prompt the appearance of geometry options (point/line/area). For instance, if the point type is selected, users can position the point above the designated feature, as illustrated below:
The Geographical Names form will be displayed and requires completion. Below is a visual representation of the Geographical Names form:

![Geographical Names Form](image)

Figure 10. The Geographical Name Form
5a.3 Web Platform

To effectively modify the spatial form of features, the finalization of survey data necessitates a larger screen. Hence, the editing of features should be conducted using the SINAR Web platform. Users can access the survey data through the data survey menu, as illustrated below:

![Figure 11. Web Platform of SINAR](image1)

Spatial editing and attribute editing can be seamlessly performed within this platform. Presented below is the interface of the editing window:

![Figure 12. Attribute Editing Window](image2)
Using SINAR as the primary tool in Indonesia’s geographical name standardization process has yielded significant impacts. The data acquisition process using SINAR Android is more convenient and efficient compared to conventional methods. Furthermore, the web-based SINAR platform offers a seamless and integrated process for standardizing geographical names, encompassing data acquisition through publication. SINAR, an online application, provides users unrestricted access from any location and time, making it particularly valuable in the COVID-19 pandemic. It aligns with the prevalent work-from-home culture and reduces the need for physical meetings while ensuring the continuity of geographical name standardization efforts.

5a.4 Future Development of SINAR

To enhance the interoperability and usability of geographical names among stakeholders, BIG also initiated the development of a geographical names application programming interface (API) in 2021. The API enables other systems managed by ministries and local governments to access and interact with the geographical names data stored in the SINAR database. However, the implementation of this API has encountered challenges, particularly in addressing user requirements. Further improvements are necessary, including incorporating user roles within the API system, providing an API catalog, enhancing geocoding capabilities, and adopting geographical name codification to facilitate linked data. Additionally, enhancements in metadata provision and the generation of Resource Description Framework (RDF) are imperative.

References