

Revitalizing Mandailing Language Through a Digital Dictionary: A Contribution to Sustainable Development in Indonesia

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ABSTRACT

Indonesia is the second most linguistically diverse country after Papua New Guinea, with 718 regional languages spread across 17,380 islands. This linguistic diversity is an invaluable cultural asset, but it faces serious threats from language shifts, education policies, and economic migration. The urgency of this research lies in the weakening of intergenerational transmission and the lack of digital documentation of regional languages, especially Mandailing. This research uses a Research and Development (R&D) approach combined with qualitative descriptive methods. The data analysis followed these steps: 1) Data collection and organization, 2) Content analysis, 3) Synthesis and model development, 4) Expert validation. The main finding is that language revitalization through digital technology is crucial in the current era, so compiling the Mandailing-Indonesian-English Digital Dictionary in digital format is a strategic solution in lexical documentation and intergenerational learning media. The findings also show that the development of this digital dictionary supports mother tongue literacy, opens up space for the integration of Mandailing in education and research, and strengthens the existence of Mandailing at the national and global levels. In conclusion, language revitalization based on digital technology is an adaptive, participatory, and sustainable step in line with the Sustainable Development Goals (SDGs).

Keywords: SDGs¹, Mandailing Language², Language Revitalization³, Multilingual Education⁴, Digital Dictionary⁵.

1. INTRODUCTION

Indonesia is immensely linguistically rich, with more than 718 local languages remaining used by native communities in its multiple regions (Badan Pengembangan dan Pembinaan Bahasa, 2024). Nevertheless, in the last decades, there has been a sharp decrease in the usage of regional languages, resulting in most of them being threatened with extinction, of which 42% are 'endangered' (Hale et al., 1992; Krauss, 1992; Crystal, 2000; UNESCO, 2003; Simons & Fennig, 2018; Roche, 2022; UNESCO, 2025; Ethnologue, 2025). However, diversity in language is also a cultural identity and a tool for sustainable development that can also fulfill the root of social inclusion, cultural development, and contextual education (Sapir, 1921; Fishman, 1991; Cummins, 2000; Hornberger, 2002; UNESCO, 2003; 2016; Piller, 2016; Skutnabb & Phillipson, 2008).

Mandailing is an indigenous Indonesian language spoken by people in Mandailing Natal Regency, North Sumatra, and it belongs to the Austronesian language family. According to data, the number of speakers of this language is 1.1 million speakers spread across all regions of Indonesia (BPS, 2000; Wikipedia contributors, 2024 & 2024; Ethnologue, 2025; UNESCO, 2025). It is spoken as a first language by all adults in the ethnic community, but not all young

people. It is not taught in schools, and even though it is an essential example of a regional language with high cultural value, it is undergoing vitality challenges and is threatened with extinction. This label is one level above the label extinct, and the language is no longer used, and no one maintains a sense of ethnic identity associated with the language (Eberhard et al., 2025; UNESCO, 2021). To prove the opinion of experts regarding the status and position of the Mandailing language in the current era at the youth level several examples of words that were tested were asked of the younger generation in Mandailing Natal Regency and they no longer knew the meaning of the word like: 1) *ancicibang* [*anciciban*] *n senggulung*; *kaki seribu*; centipede, 2) *bartak* [*bartak*] *n kandang kambing*; goat barn, 3) *buriang* [*buriyan*] *n ayam yang berbulu coklat*; brown feathered chicken, 4) *tonggi* [*tongi*] *a manis*; sweet, 5) *tona* [*tona*] *n pesan*; message, 6) *bircak* [*birsak*] *n percik*; splash/spark.

This research aims to shed light on the role of linguistic diversity in supporting sustainable development in Indonesia and highlight the importance of Mandailing language preservation as part of the national development strategy. The urgency of this research lies in the increasingly critical status of regional languages in Indonesia, particularly Mandailing, which is endangered due to weak intergenerational transmission and lack of digital documentation. In line with SDGs, this study focuses on the strategic use of technology for language revitalization and seeks to propose sustainable and community-based solutions by developing a Digital Dictionary Bahasa Mandailing-Indonesia-English.

2. METHODS

This research uses a research and development (R&D) approach combined with qualitative descriptive methods. The main focus of this research is literature study and document analysis to explore the relationship between language diversity, language policy, and sustainable development in the Indonesian context, with Mandailing as a case study. Data was collected from various sources, including academic references, UNESCO reports, government policies related to language and education, and documentation of Mandailing language. The data analysis consists of steps: a. Data collection and organization: all references and documents were categorized based on thematic relevance (language policy, cultural identity, digital resources, and sustainability). b. Content analysis (key themes, patterns, and insights) was extracted using qualitative content analysis, allowing in-depth interpretation of texts and policies. c. Synthesis and model development: were synthesized to inform the development of the Bahasa Mandailing–Indonesian–English Digital Dictionary. d. Expert validation (for R&D output): linguists and educators reviewed a prototype of the digital dictionary to assess its relevance and effectiveness in supporting local language preservation.

One of the main outputs of this research is the development of the Mandailing-Indonesia-English Digital Dictionary, which aims to support the preservation of local languages and contribute to developing digital linguistic resources. This approach allows for an in-depth exploration of the sociolinguistic aspects, language policies, and ecological values contained in Mandailing language and how it can contribute to achieving sustainable development goals (SDGs). Ultimately, it can maintain the sustainability of Mandailing language now and in the future.

3. DISCUSSION

3. 1. Indonesian Linguistic Landscape

With a population of approximately 281,603.8 million, according to 2024 data (BPS, 2024), Indonesia has Indonesian as the national language spoken by more than 97% of the population. Meanwhile, more than 718 regional languages are spoken in local communities spread across 17,380 islands (Badan Informasi Geospasial, 2024), making Indonesia one of the most linguistically diverse countries globally. However, many of these local languages are experiencing a significant decline in usage. It suggests that language diversity as a cultural resource is now fragile.

3. 2. The Challenge of Preserving Regional Languages

There are some challenges in local language preservation in Indonesia as follows:

- a. Intergenerational transmission disorders: 90% of local languages have broken transmission from old to new generation.
- b. National education system: the availability of a national curriculum focusing on Bahasa Indonesia and foreign languages replaces and hastens the disappearance of local or indigenous languages.
- c. Economic migration: urbanization and migration lead to declining local languages in domestic and social spaces.
- d. Cultural identity: when local languages die out, their unique ways of thinking, values, and cultural expressions also disappear (Fisman, 1991; Skutnabb-Kangas, 2000; Spolsky, 2004; Mahsun, 2005).

3. 3. Language and the Sustainable Development Goals (SDGs)

Within the Sustainable Development Goals framework, particularly Target 4.7, education should promote respect for cultural and linguistic diversity (Skutnabb-Kangas, 2000; Benson, 2004; UNESCO, 2017). Integrating local languages into education has great potential to improve learning outcomes, especially in remote areas. Mandailing language preservation through community-based education is an effective strategy in this context. Mother tongue-based learning programs strengthen learners' identity and increase their participation and understanding of learning materials.

3. 4. Mandailing Language as a Medium for Cultural Preservation

Mandailing language is a communication tool and a complex cultural system. The "*tutur*" tradition, as a polite and harmonious form of communication, plays an important role in maintaining the social balance of the community. In addition, traditional oral literature, such as *markobar*, has been an important medium in transmitting local values and knowledge for generations. Within this perspective, language can be viewed as a medium to carry cultural knowledge and social identity (Spradley, 1980; Nababan, 1984; Duranti, 1997; Kridalaksana, 2008; Simanjuntak, 2010; Sibarani, 2015; Siregar, 2018).

3. 5. Language Strategic Planning

At that time, the Indonesian government became more concerned about regional language extinction through the regional language revitalization program, which the Pusat Pengembangan dan Pembinaan Bahasa set up. The implemented strategies include (but are not limited to the following):

- a. Technology-mediated language documentation and language learning (apps, digital dictionaries)
- b. Implementation of multilingual signage and educational materials
- c. National teacher training programs in local languages
- d. Community-based preservation model, in which local communities act as the primary agents of revitalization (Badan Pengembangan dan Pembinaan Bahasa, 2021; Pusat Pengembangan dan Pelindungan Bahasa dan Sastra, 2021).

3. 6. Case Study: Mandailing Language Revitalization with the Bahasa Mandailing-Indonesia-English Digital Dictionary

Mandailing is spoken in North Sumatra by people known as the Mandailing Natal. It features unique phonological and morphological traits and has a highly developed social communication system. As Nababan (1991) states, a local language such as Mandailing symbolizes a community because it is a tool to sustain local cultural continuity. However, this language faces various challenges, including the lack of documentation, institutional support, and weak intergenerational transmission. It is in line with Fishman's (1991) assertion that the greatest threat to the survival of minority languages is dysfunction in intergenerational transmission.

One of the concrete efforts to overcome this challenge is the documentation of vocabulary in the form of the Mandailing-Indonesian-English General Dictionary in digital format. As Himmelmann (1998) explained, this documentation is an important first step in maintaining endangered languages. This lexicographic digital dictionary contributes as a tool to learn and a medium for researchers, students, and the world to appreciate the lexicon and semantics of Mandailing. According to Hinton (2011), an important aspect of a technology-based revitalization strategy is having easily accessible resources, such as online dictionaries. The presence of this trilingual dictionary also strengthens the position of Mandailing in education and internationalization, which aligns with Austin and Sallabank's (2011) idea of the importance of expanding the domain of minority language use to increase its vitality.

Furthermore, Mandailing language has the potential to be developed as part of sustainable development. According to Crystal (2000), preserving a language means preserving the knowledge acquired through generations of experience, which can be stored in a language. Hence, incorporating Mandailing language in the curriculum, the availability of learning media, and community participation in culture preservation are strategic measures that support sustainable revitalization (Grenoble & Whaley, 2006).

Information technology is important for language preservation and development in the digital era. Hinton (2013) notes that digital technology provides a great opportunity to create linguistic archives that can be accessed across generations. In this context, the Mandailing-Indonesian-English Dictionary serves as a learning aid and a form of linguistic heritage preservation relevant to the younger generation. This digitization project can also be a major source for developing teaching materials, linguistic research, and promoting Mandailing culture nationally and globally. In line with Austin and Sallabank's (2011) view, digital documentation enables participatory and sustainable language preservation. Thus, integrating digital technology in language revitalization strengthens the existence of Mandailing language in globalization and affirms its role in today's digital knowledge ecosystem.

3. 7. Format and Display of the Bahasa Mandailing-Indonesia-English Digital Dictionary

Researchers built a dictionary from the design and trial of the Mandailing-Indonesian-English Digital Dictionary as explained in the table below.

Table 1. Components of the Bahasa Mandailing-Indonesia-English Digital Dictionary

Components	Description
Header	- Title: "BAHASA MANDAILING-INDONESIA-ENGLISH DIGITAL DICTIONARY" - Logo: Mandailing cultural icon - Navigation Menu: Home, Word Search, About, Help
Search Column	- Word Input: Text box with placeholders "Enter words in Mandailing, Indonesian, or English" - Search Button: Magnifying glass icon or button "Search"
Search Results View	- Searchable Word: Displayed in large, bold font - Meaning: - Bahasa Mandailing: [Mandailing words] - Bahasa Indonesia: [Indonesia words] - Bahasa Inggris: [Meaning in English] - Example Sentence: - Bahasa Mandailing: [Example sentences] - Bahasa Indonesia: [Translation] - Bahasa Inggris: [Translation]

	- Audio Pronunciation: Speaker icon to listen to the pronunciation of words
Additional Features	- Favorites: Star button to save the word to the favorites list - Search History: List of words that have been searched - Word Categories: Filter by category (nouns, verbs, common phrases).
Footer	- Contact Information: Email, phone number, or social media for support - Copyright: "© 2025 BAHASA MANDAILING-INDONESIA-ENGLISH DIGITAL DICTIONARY. All rights reserved" - User data (e.g., results of student trials)
Responsive Display	- User-friendly design for mobile and desktop. - Dominant color: Neutral or Mandailing culture-inspired colors
Word Input	- Users participate by entering words not yet in this dictionary database, which the developer will then sift.

The image below is the front view of the dictionary that was developed. This image was chosen to represent the characteristics of the local wisdom of the Mandailing tribe, where there are images of traditional houses, traditional musical instruments, and the colors gold, red, and white, all of which are efforts to preserve Mandailing culture and language.

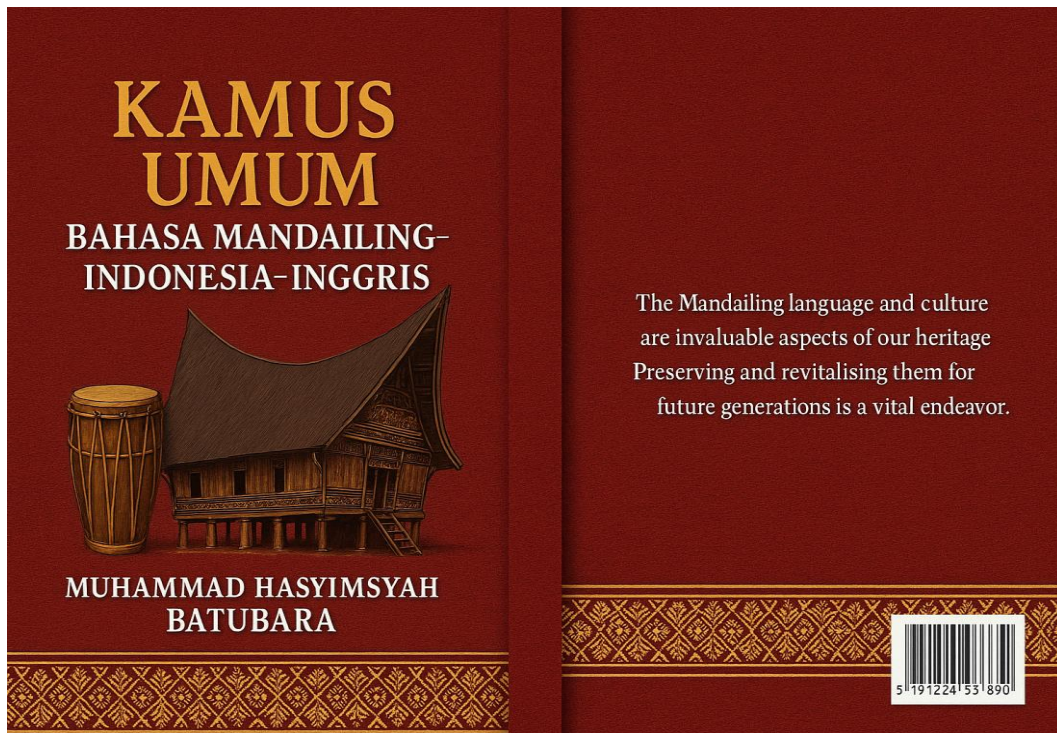


Figure 1. Home screen of Bahasa Mandailing-Indonesian-English Digital Dictionary

Figures 2 and 3 below are the basic display of the dictionary that is being developed. The display of this dictionary was deliberately created and developed as simply as possible for general ease of use.



Figure 2. Views and Components of Bahasa Mandailing-Indonesia-English Digital Dictionary

KAMUS UMUM BAHASA MANDAILING-INDONESIA-INGGRIS BAHASA MANDAILING-INDONESIAN-ENGLISH DIGITAL DICTIONARY

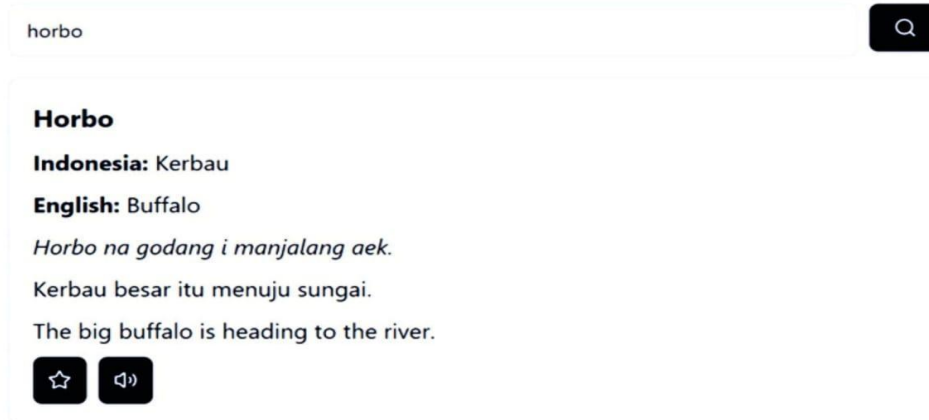


Figure 3. Word search example in Bahasa Mandailing-Indonesia-English Digital Dictionary

4. CONCLUSION

Indonesia's linguistic diversity is a strategic resource that can support sustainable development. Languages are important in promoting social inclusion, cultural preservation, and contextualized education. An integrated approach to preserving regional languages, such as Mandailing, through policy, education, technology, and community empowerment will greatly contribute to sustainable national development. We should see language revitalization efforts as a cultural project, thus part of implementing the key development strategy. Mandailing language, as one of the cultural heritage of the people of North Sumatra, faces serious challenges in its sustainability, especially related to weak intergenerational transmission and lack of documentation. Efforts to revitalize this language are very important to maintain cultural identity and the local knowledge contained in it. Information technology has provided great opportunities for regional language preservation in the digital era. Preparing the Mandailing-Indonesian-English General Dictionary in digital format is one of the strategic and applicable steps that support the preservation and development of the Mandailing language. This digital dictionary is a learning and documentation tool and a medium of connection between the younger generation and their linguistic heritage. With the support of local communities and integration into the education system, revitalizing the Mandailing language through a digital approach can be a model of adaptive, participatory, and sustainable regional language preservation in globalization.

In line with these findings, the following recommendations are proposed: a) Policy Integration: local languages such as Mandailing should be integrated into the school curriculum, particularly in regions where the language is still spoken, to strengthen intergenerational transmission and formal recognition. b) Community-based programs: encourage and support community-driven language revitalization initiatives, such as local

language festivals, workshops, and oral history documentation. c) Digital expansion: further develop and promote digital tools (e.g., mobile apps, online courses) that enable easier access and engagement with the Mandailing language, especially for younger speakers.

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