YEAR 2024-25

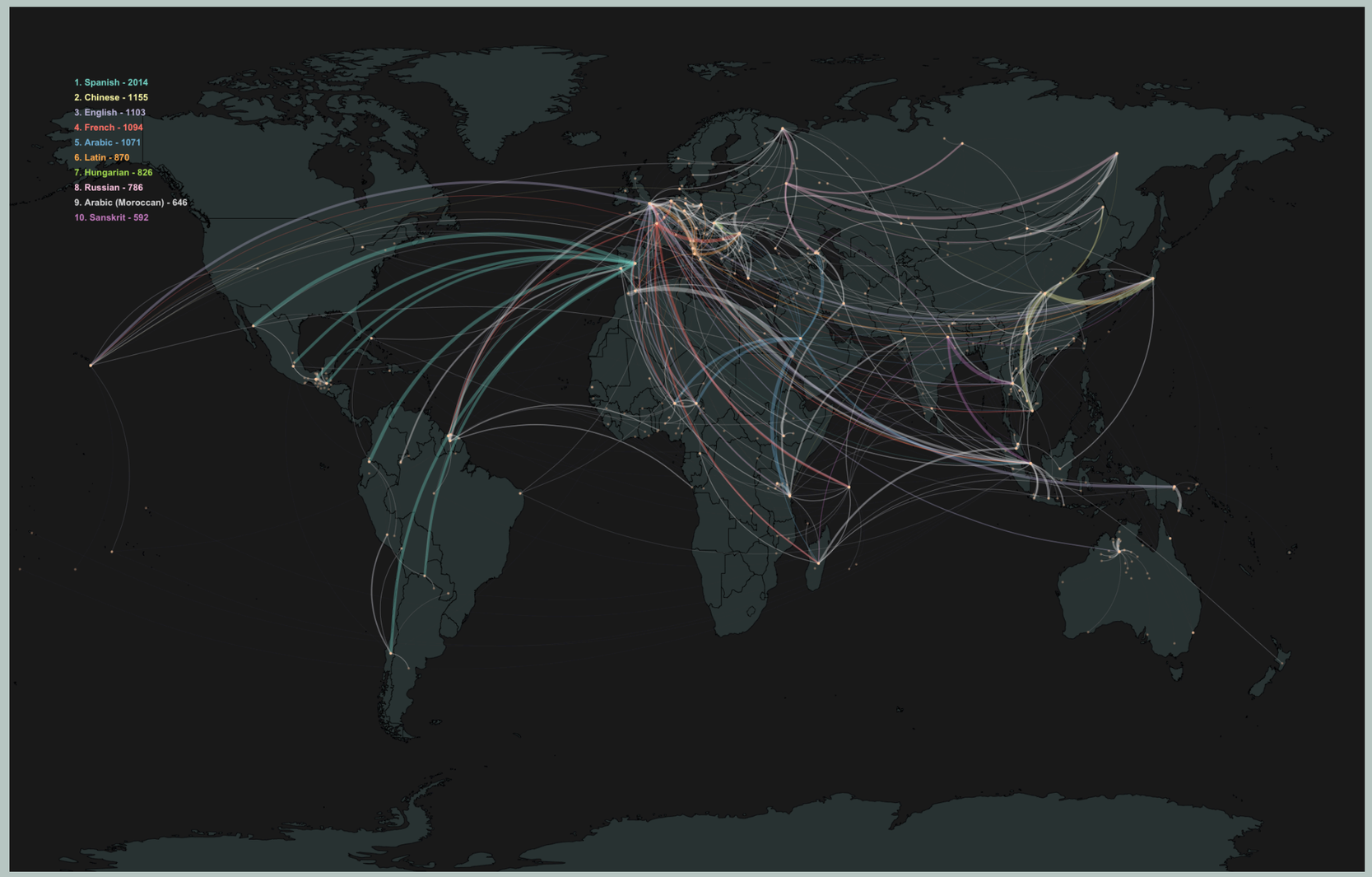
EXAM CANDIDATE ID:	**LBMP0**
MODULE CODE:	**GEOG0162**
MODULE NAME:	**Cartography and Data Visualisation**
WORD COUNT:	**1496 words (including references etc)**

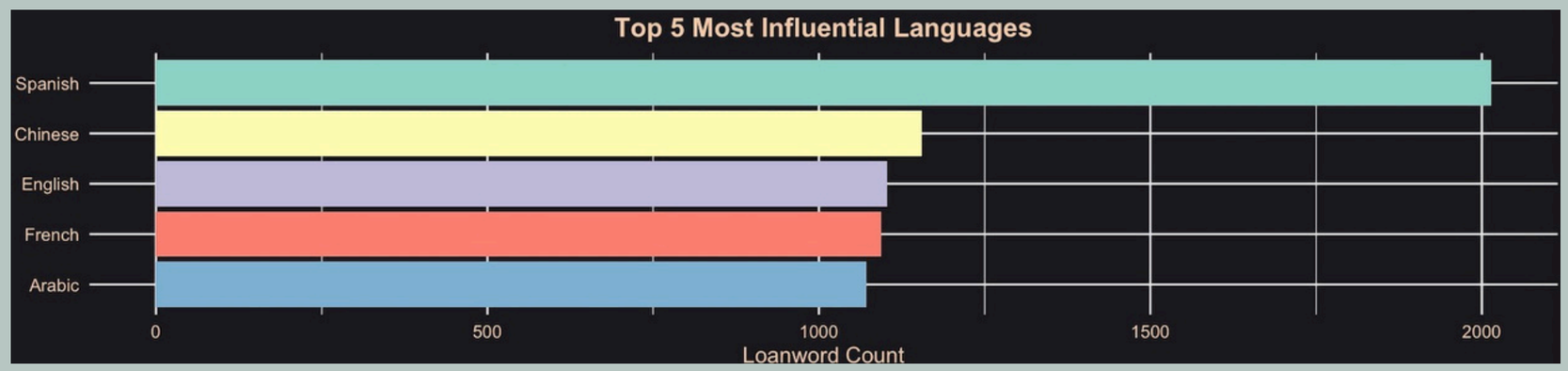
LANGUAGE

In today’s globalized world, a few dominant languages continue to expand through international media, education, and commerce, while many others steadily lose ground. Each year, a portion of the world's approximately 7,000 languages disappears (Ahmed, 2025). Samar Michael Soren, Founder and Head of the Language Resource Hub has noted that "When language survives, nature survives. Language is not just for poetry; it provides us with food, culture, and identity." (UNESCO, 2025)

This map series looks at how language shifts across today’s world by tracing its movement, disappearance, and potential for renewal. The goal is to offer a visual narrative for educators, technologists, and policymakers, aiming to support efforts in cultural preservation and digital equity.

I. LOANWORDS ON THE MOVE





Data Source: The World Loanword Database (2014)

WHERE WORDS TRAVEL

This map visualizes the exchange of 14,680 loanwords among languages worldwide. Spanish, Chinese, English, French, and Arabic are the main “exporters” of loanwords. Arabic remains dominant in North Africa and the Middle East, while French has left clear marks in West Africa.

WHY WE BORROW

Loanwords, or words borrowed from one language into another, often reflect deeper historical ties such as trade, colonization, or cultural exchange. For example, early Germanic tribes adopted many Latin terms through commerce with the Romans. The use of loanwords can also signal power imbalances, where the source language holds greater influence. English is a prime example, shaping global vocabulary especially in science and technology (Shaiek, 2014).

FROM FOREIGN TO FAMILIAR

Many English loanwords still carry traces of their origins. Words like ballet (French), piano (Italian), and robot (Czech) are classic examples.As pronunciations soften and spellings shift, their initial sense of foreignness often fades. Through this gradual process, language quietly records the story of cultural connection (Kemmer, 2017).

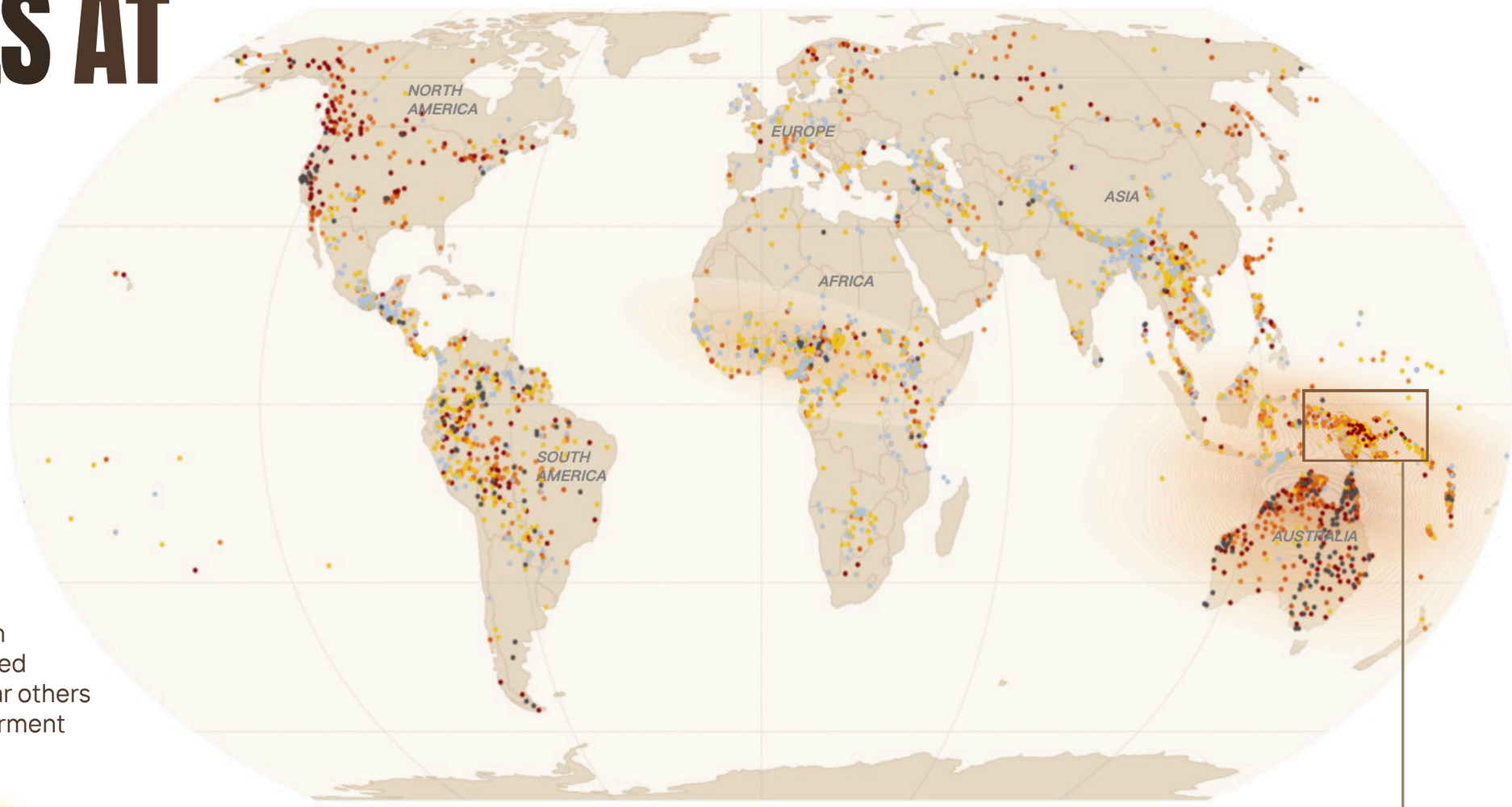
II. LANGUAGES AT THE EDGE

Risk Clusters

Each point represents an endangered language. High-density clusters are found in northern Australia, Papua New Guinea, and northern South America. These regions are generally remote from urban and political centers.

Endangerment is Contagious

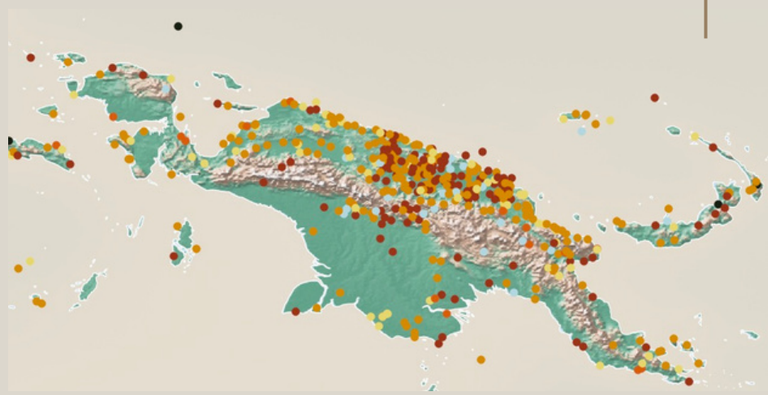
Endangered languages often do not exist in isolation. In this pattern, critically endangered languages are more likely to be located near others with a similar level of risk, forming endangerment hotspots (Lee, Siew and Ng, 2022).



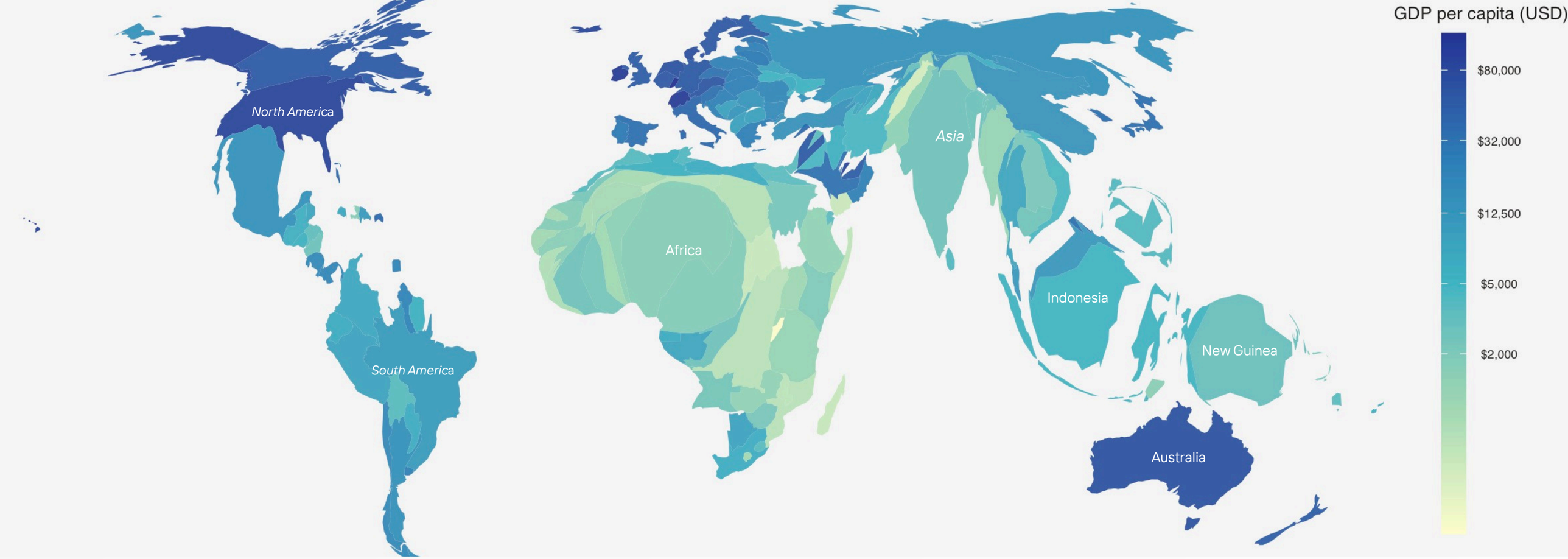
PAPUA NEW GUINEA

Papua New Guinea hosts 840 living languages, making it the most linguistically diverse country in the world (Spooner, 2025). In every valley, a distinct language has taken root. Yet this richness is fragile. Endangered languages are densely clustered. Some are language isolates with no known relatives, making their loss particularly irreversible.

IIn the village of Gapun, the Tayap language is disappearing, with fewer than fifty elderly speakers remaining. Villagers have increasingly adopted Tok Pisin, the national lingua franca, seeking education and employment opportunities. This shift was not abrupt but rooted in deeper historical forces. Colonial rule, missionary activity, and logging have eroded cultural practices (Chao, 2020). The silence of Tayap also marks the fading of ecological knowledge, including names of birds, plants, and climate patterns, once rooted in the everyday language.

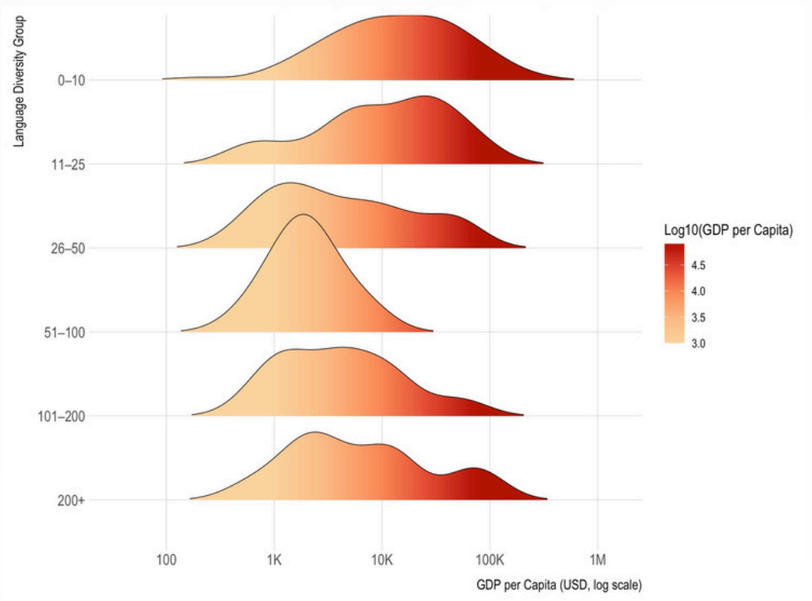


Data Source: Endangered Languages Project (ELP)



III. LANGUAGE DIVERSITY AND DEVELOPMENT

Country boundaries are distorted to reflect the number of living languages, revealing a negative correlation between language diversity and economic development. Although Asia and Africa together account for nearly two-thirds of the world's languages, their GDP per capita ranks among the lowest (OMBONGI, 2023). This pattern is reinforced by the Ridgeline plot, where distributions progressively shift left as language count increases.

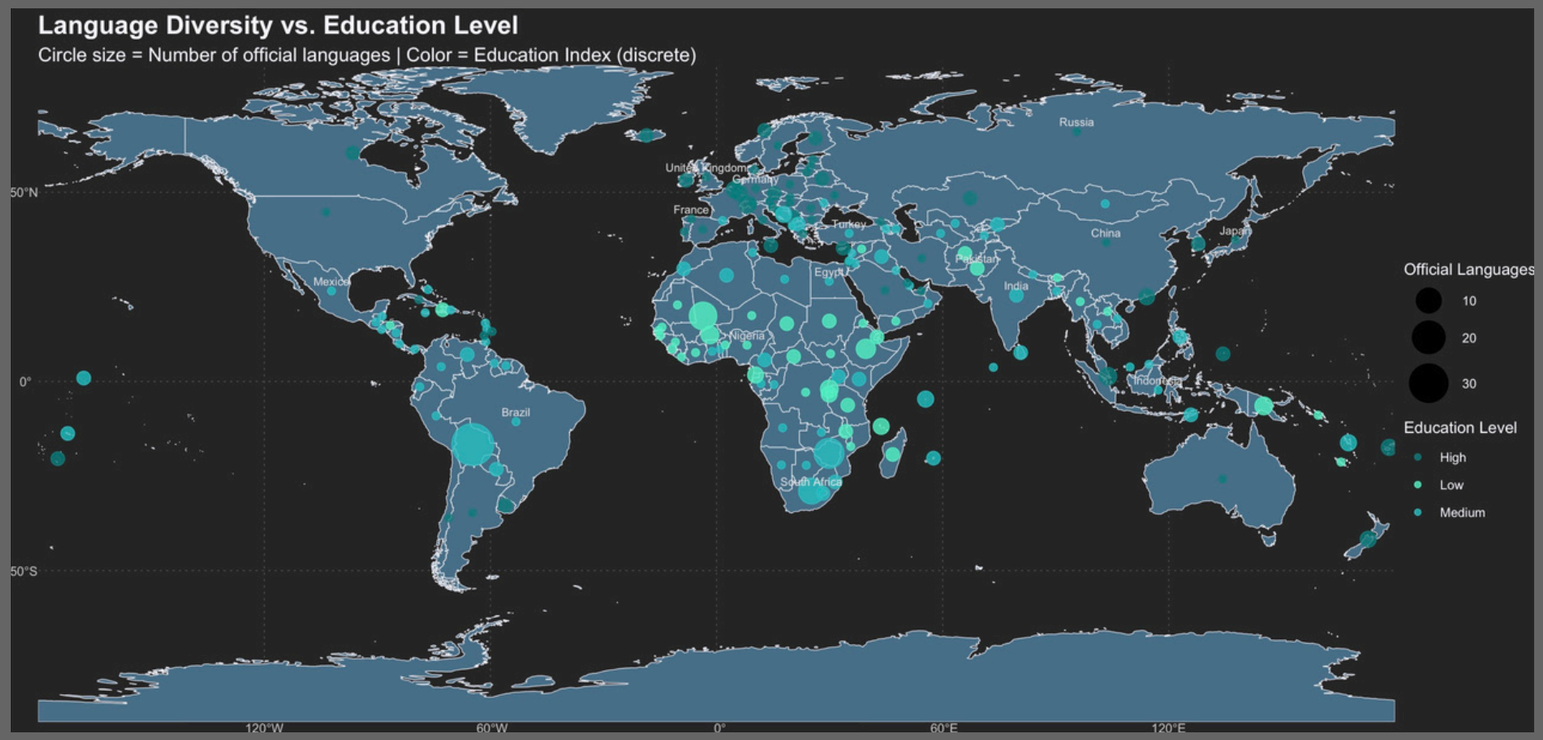


Diversity or Division?

A high number of languages within a country does not automatically impede development. What matters is how linguistic groups interact. Desmet et al. (2012) identify two key risks: linguistic fractionalization, where small groups remain isolated, and linguistic polarization, where large groups compete for dominance. In multilingual societies, communication and coordination entail higher transaction costs, which may limit market integration and slow economic growth. Language diversity should not be seen as an obstacle to development. When supported by inclusive governance and multilingual education, language diversity can strengthen identity and social cohesion (Alesina et al., 2003).

Data Source: GDP per capital: wikipedia (2023), Diversity: Ethnologue

IV. LANGUAGE DIVERSITY AND EDUCATIONAL EQUITY

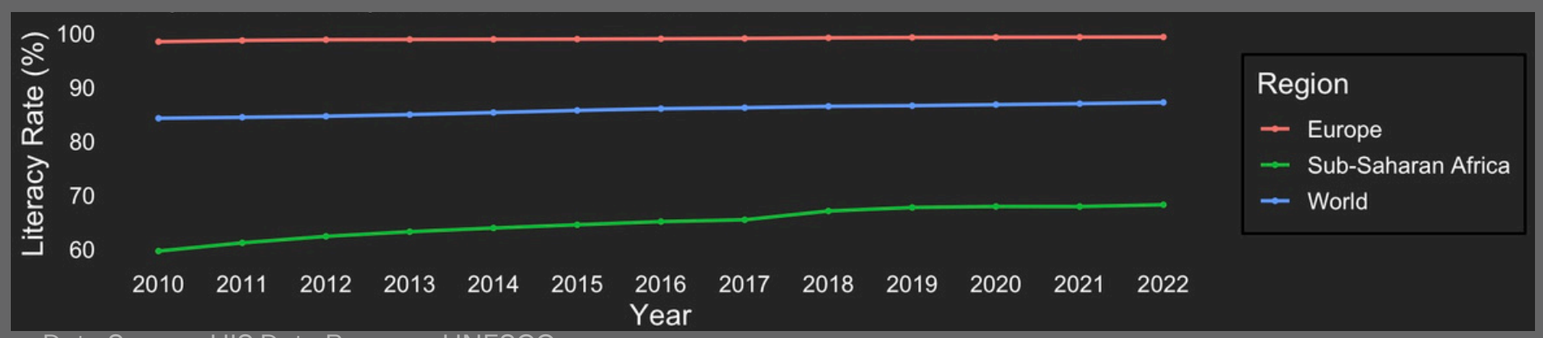


Data Source: Wikipedia - Education Index (2019)

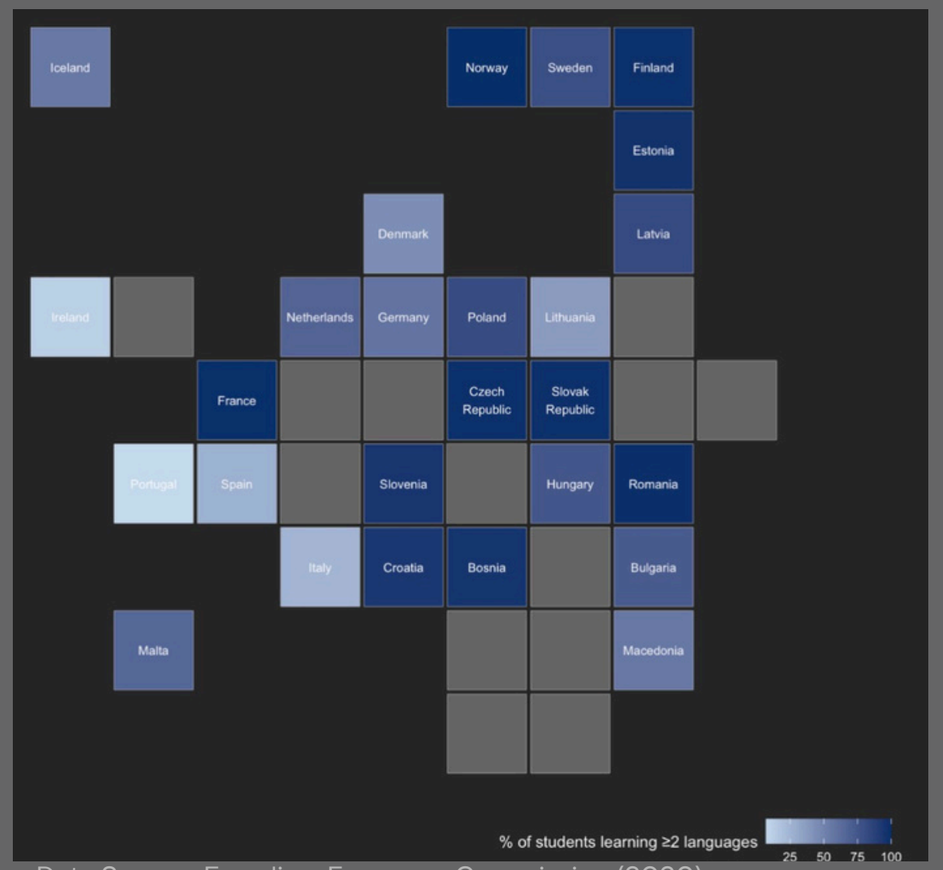
This map shows the relationship between language diversity and education levels. Sub-Saharan Africa stands out with high linguistic diversity but low educational attainment. In many African countries, limited educational resources and the use of former colonial languages such as English, French, or Portuguese in instruction create a linguistic mismatch, as most students do not speak these languages at home (Share and Safra, 2023). This can hinder comprehension and academic performance, contributing to persistently low literacy rates.

By contrast, countries that have implemented inclusive language policies and invested in multilingual education systems tend to achieve better outcomes. The Tile Grid map shows that in many European countries, more than 75% of high school students study at least two foreign languages.

The number of languages in a country does not guarantee actual language use or ability. Without adequate educational infrastructure and instruction in mother tongues, language diversity may remain a symbolic right rather than a functional asset for learning and inclusion.



Data Source: UIS Data Browser, UNESCO

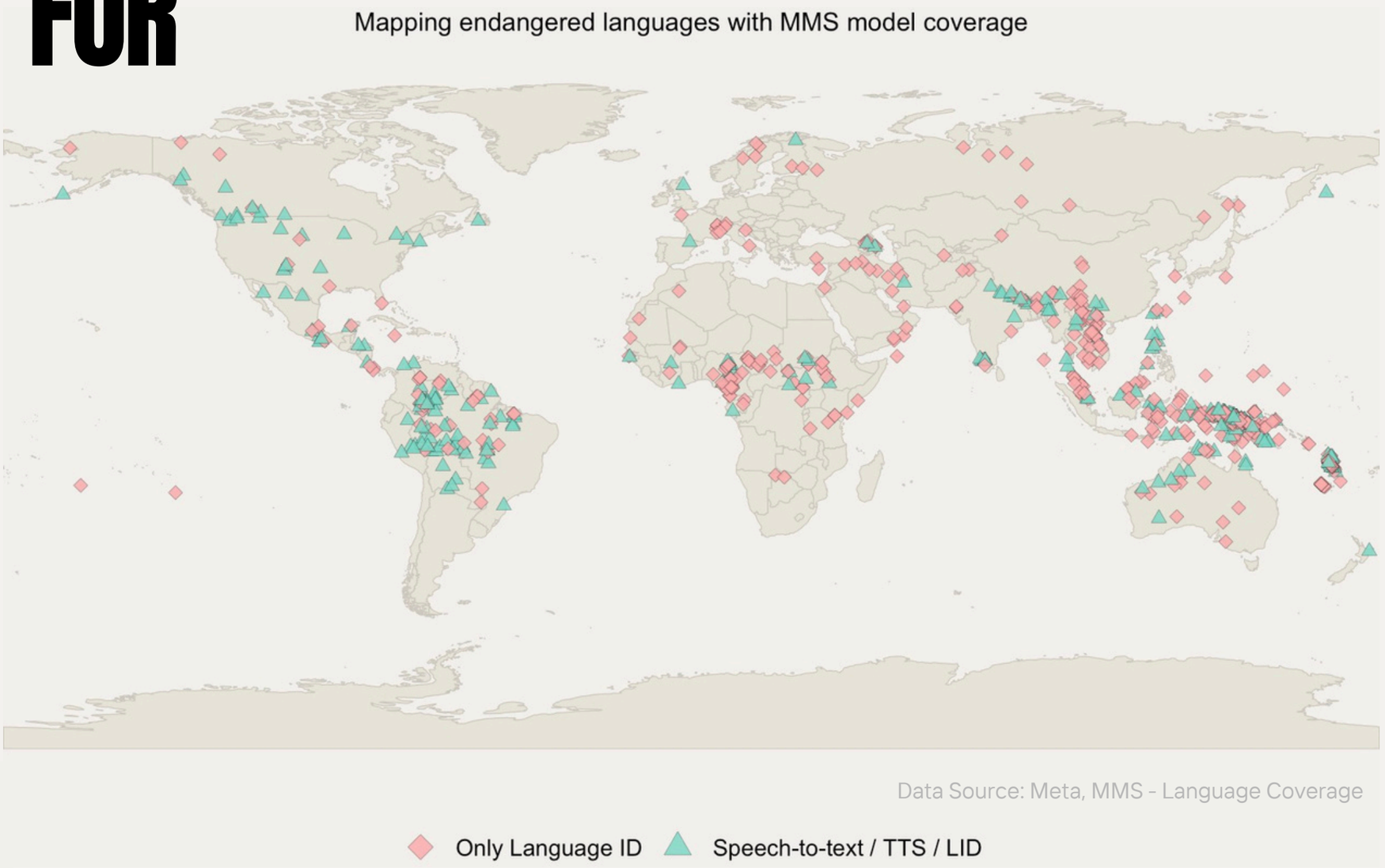


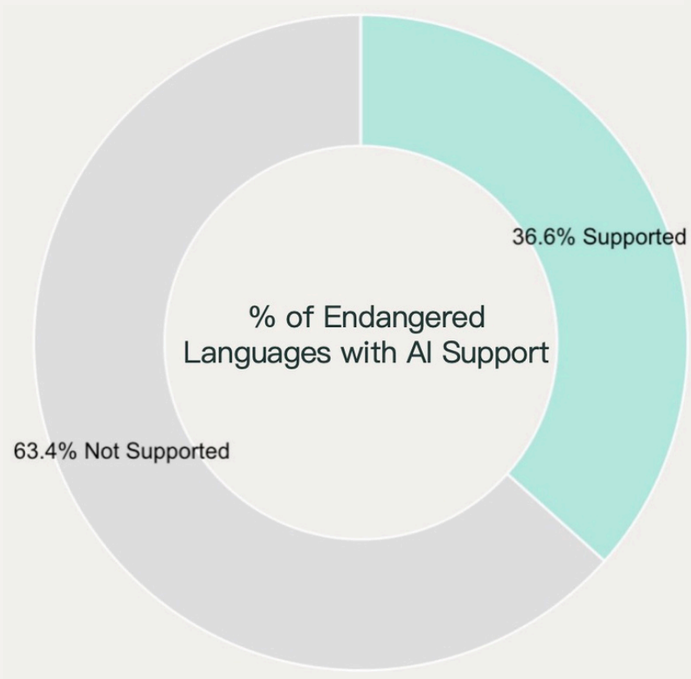
Data Source: Eurydice, European Commission (2020)

V. AI SUPPORT FOR ENDANGERED LANGUAGES

This map, based on Meta's Massively Multilingual Speech (MMS) project, shows the extent of AI coverage for endangered languages. It distinguishes between languages that are only supported by basic identification and those that receive more comprehensive AI assistance.

Speech-to-text technology enables the systematic documentation of languages that lack established writing systems. Text-to-speech (TTS) systems provide synthesized pronunciations that support





language revitalization. Language identification (LID) models help classify and retrieve linguistic data in multilingual contexts, ensuring that endangered languages are properly recognized and archived (Meta, 2023).

The MMS project has developed speech models for over 1,100 languages and identification systems for more than 4,000 languages (Meta, 2023). By leveraging large-scale unlabeled datasets, including recordings of religious texts, it has achieved unprecedented coverage. Although many critically endangered languages remain underserved, it is possible to envision a future in which technology plays a restorative role. By enabling people to access information and use digital tools in their most valued languages, technology may help sustain and revitalize global linguistic diversity (Othon Viannis, 2024).

WHAT CAN BE IMPROVED

The current map series mainly focuses on static factors such as economic development, education, and AI. Future studies could enrich the analysis by incorporating the dimension of population movement. Specifically, attention could be given to internal migration, cross-border migration, and refugee flows caused by wars or economic crises, all of which often lead to the formation of new multilingual environments (Kerswill, 2006). Improvements in visual design could also be considered. In the endangered language hotspot map, increasing contrast or adopting warmer color palettes could help make hotspot areas in Africa more visually distinct against the background. Furthermore, in examining AI support for endangered languages, the broad categorization may overstate the actual extent of protection. Differentiating languages that have full speech-to-text and text-to-speech support would help avoid misleading evaluations of the current level of technological coverage.

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