

The Ecology of Revitalization: A Multi-Dimensional Comparative Framework of Indigenous Language Preservation

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ABSTRACT

The global language endangerment crisis has intensified in the twenty-first century (40% of the world's 7,000 languages are now threatened with extinction). Although scholarship addresses individual aspects of revitalization, a holistic comparative framework is needed. This paper presents the Language Revitalization Ecology Model (LREM), which conceptualizes revitalization as an ecological process involving five interdependent pillars: Legislative Architecture, Educational Infrastructure, Community Agency, Media Ecosystems, and Intergenerational Transmission. A qualitative, purposive comparison examines Te Reo Māori (Aotearoa New Zealand), 'Ōlelo Hawai'i (Hawai'i), Cymraeg (Wales), Euskara (Basque Country), and Sámi languages in Norway, Sweden, and Finland. The cases illustrate how legal, educational, community, media, and household dimensions interact, while also revealing a persistent evidence and comparability challenge: institutional provision and speaker ability do not by themselves establish intergenerational transmission. The paper offers a preliminary diagnostic framework and discusses its implications for language policy and community-led revitalization.

INTRODUCTION

The twenty-first century is experiencing an unprecedented acceleration in the loss of linguistic diversity around the world. Of the seven thousand languages spoken today, forty percent are endangered (UNESCO 2021; Ethnologue 2024). Most of these are indigenous languages (UNESCO 2021; Ethnologue 2024). The extinction of an indigenous language is not only losing a means of communication but also losing epistemologies unique to that people, ecological knowledge systems and cultural identities developed over millennia: "Languages are not words — they're worlds" (UNESCO 2025), and their loss erodes humanity's collective intellectual heritage. In response, UNESCO (United Nations Educational, Scientific and Cultural Organization) designated the period from 2022 to 2032 as the International Decade of Indigenous Languages (IDIL) to mobilise stakeholders worldwide to preserve revitalize and promote threatened linguistic ecosystems (United Nations General Assembly 2019).

While international awareness of revitalization efforts has increased and grassroots programs have proliferated, the results are uneven: some languages (Euskara in the Basque Country; Te Reo Māori in Aotearoa New Zealand) have seen remarkable demographic resurgences while others struggle against overwhelming pressures from dominant colonial or national languages (Basque Government 2021; Stats NZ 2024). This disparity reflects a gap in the current sociolinguistic literature — no multi-dimensional framework to compare disparate revitalization programs across different geopolitical and historical contexts. Research has typically focused on single variables (e.g., immersion schooling effectiveness or official language legislation impact) without considering how they interact with each other within a sociolinguistic ecosystem.

This paper fills this gap by developing an original analytical framework: the Language Revitalization Ecology Model (LREM). The central thesis of this work is that indigenous language revitalization cannot be achieved through policy actions or community initiatives alone; it must be understood and operationalised as an ecological process requiring simultaneous, synergistic intervention at five interrelated levels (Legislative Architecture, Educational Infrastructure, Community Agency & Ownership, Media & Digital Ecosystems and

Intergenerational Transmission Mechanisms). Using this new framework we compare Te Reo Māori, ‘Ōlelo Hawai‘i, Cymraeg (Welsh), Euskara (Basque) and Sámi languages to illustrate top-down state support vs bottom-up community mobilization. These insights provide a strategic roadmap for policymakers educators and indigenous advocates who are doing the hard work of reversing language shift.

The rest of the paper is organized as follows. Section 2 reviews the existing theoretical literature and introduces LREM; Section 3 describes the comparative case study methodology; Section 4 presents the five individual case analyses through the lens of the LREM; Section 5 discusses emergent patterns and dynamics across cases; and Section 6 concludes with policy implications and directions for future research.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Existing Frameworks of Language Endangerment and Revitalization

The academic literature on language endangerment and revitalization has been based on scales that measure vitality or decline of a language but not mechanisms of recovery. The first work in this area was Joshua Fishman’s Graded Intergenerational Disruption Scale (GIDS) introduced in 1991 as part of his wider theory Reversing Language Shift (RLS). Fishman’s eight-level scale defined language endangerment primarily according to the extent to which a language is transmitted from generation to generation within home and community domains (Fishman, 1991). Stage 6 — when a language is still being used orally by all generations and children are learning it as their first language — is where linguistic survival really begins for Fishman (Fishman, 2001). He changed scholarly attention away from documenting language loss to actively pursuing language recovery and remains the most cited model in the field.

Fishman’s GIDS was a diagnostic tool but later scholars have noted that it did not address modern revitalization efforts well. Lewis and Simons (2010) extended Fishman’s GIDS to the thirteen level Expanded Graded Intergenerational Disruption Scale (EGIDS) which covered more societal domains (language use in education, government and international communication), as well as a wider range of languages than before (cited over 1000 times). This gave a finer grained assessment of language vitality but like its predecessor is an evaluative rubric for measuring how healthy a language is rather than a strategy for orchestrating revival.

Other theories have tried to capture the structural elements required for language maintenance. Hornberger’s (2006) Continua of Bilingualism framework highlights contexts, media, content and development of bilingualism as intersecting environments in which revitalization must take place; Stephen May (2012) on language and minority rights stresses the role of legal and institutional support — indigenous languages cannot survive in private if they are systematically excluded from public domains of power and commerce; Spolsky (2004) expanded this discourse by defining language practices, language beliefs and language management as three interrelated aspects of language policy. All these theories provide insights into specific aspects of language policy and education but rarely have a multi-dimensional structure that can be applied uniformly to comparative case studies of active revitalization programs so the field needs a framework that brings them together.

Proposing the Language Revitalization Ecology Model (LREM)

To overcome the limitations of evaluative scales and single focus theories this paper proposes the Language Revitalization Ecology Model (LREM). The LREM does not see language revitalization as a linear process from endangerment to safety but rather as an ecosystem in which structural and social elements must interact symbiotically. Ecological theory informs it by saying that the health of a linguistic ecosystem is dependent on the vitality of each of its elements and the way these inter-relate. The model is built on five interdependent pillars, each representing one critical domain of intervention.

Pillar 1: Legislative Architecture. This pillar encompasses the formal legal and political frameworks that define the status of the indigenous language within the state. It includes constitutional recognition, official language acts, the establishment of statutory bodies tasked with language planning, and the allocation of public funding for revitalization programs. Legislative architecture provides the essential juridical foundation that

protects linguistic rights, mandates state investment, and legitimizes the language in the public sphere (Williams, 2014). Without robust legislative backing, revitalization efforts remain vulnerable to shifting political climates and lack the institutional permanence required for long-term success. The strength of this pillar is assessed by the degree of formal legal recognition, the existence of dedicated language planning agencies, and the level of sustained public funding.

Pillar 2: Educational Infrastructure. The educational pillar represents the formal systems through which the language is taught and acquired outside the home. This includes early childhood language nests, primary and secondary immersion programs, bilingual educational models, adult literacy initiatives, and tertiary-level programs in the indigenous language. Educational infrastructure is frequently the primary engine for creating new speakers (often termed "new speakers" or "neo-speakers") in communities where intergenerational transmission has been disrupted (Cenoz, 2009). The effectiveness of this pillar is heavily dependent on the availability of trained pedagogical staff, culturally relevant curricula, adequate teaching materials, and seamless articulation from early childhood through tertiary education.

Pillar 3: Community Agency and Ownership. This pillar addresses the grassroots, socio-psychological dimension of revitalization. It encompasses the active participation, leadership, and emotional investment of the indigenous community in the preservation of their language. Community agency involves the creation of autonomous cultural spaces, the mobilization of volunteer networks, the assertion of linguistic identity as an act of decolonization and self-determination, and the psychological sense of ownership over the revitalization process (King, 2001). This pillar recognizes that top-down legislative and educational initiatives are likely to fail if they are not deeply rooted in and driven by the authentic desires and agency of the language community itself. As the UNESCO (2021) flagship report concluded, "indigenous leadership is essential to ensure the development and implementation of effective and sustainable plans, policies and actions."

Pillar 4: Media and Digital Ecosystems. In the contemporary globalized context, a language must possess utility and visibility beyond traditional cultural domains. This pillar includes the presence of the indigenous language in print media, television broadcasting, radio, and increasingly, digital platforms, social media, and software interfaces. A robust media ecosystem normalizes the use of the language in modern contexts, enhances its prestige among younger generations, and provides crucial exposure for learners outside the classroom environment (Grenoble & Whaley, 2006). In the digital age, the absence of a language from the internet, mobile applications, and social media platforms can signal its irrelevance to younger speakers, accelerating shift toward the dominant language.

Pillar 5: Intergenerational Transmission Mechanisms. The final and most critical pillar concerns the natural, unforced passing of the language from parents to children within the family and community setting. While educational infrastructure can produce fluent second-language speakers, true revitalization—as Fishman (1991) vehemently argued—is only achieved when these new speakers choose to raise their own children in the indigenous language. This pillar represents the ultimate bottleneck in many revitalization programs: translating school-based proficiency into home-based vernacular use. Its assessment considers the proportion of households where the indigenous language is the primary medium of communication and the rate at which "new speakers" are transmitting the language to the next generation.

The LREM posits that these five pillars are not merely additive, but multiplicative. A deficiency in one pillar can critically undermine the successes achieved in others. For instance, a strong educational infrastructure will ultimately falter if it is not supported by community agency or if it fails to translate into intergenerational transmission. Conversely, passionate community agency without legislative and educational backing may lack the institutional resources to achieve scale. The subsequent sections of this paper utilize the LREM to conduct a comparative analysis of five distinct indigenous language revitalization programs, examining how the dynamic interplay of these five pillars has shaped their respective trajectories.

METHODOLOGY

This study uses a qualitative, structured, focused comparison of five language revitalization ecologies. A case-study design is suited to examining how policy, education, community action, media, and family transmission interact within their historical and jurisdictional settings (Yin, 2018). The cases are purposive analytic contrasts, not a representative or random sample; the comparison supports theory-informed interpretation rather than statistical generalization.

Case selection and scope. The five cases were selected to vary in governance and territorial organization, the balance of state-led and community-led action, educational development, and the cross-border character of the language community. Māori and Hawaiian revitalization foreground community-initiated action followed by formal state recognition; Welsh provides a devolved institutional and education-policy case; Basque illustrates regional institutionalization alongside a cross-border language community; and Sámi languages provide a multi-jurisdictional comparison. The unit of analysis is the revitalization ecology within the territory for which the cited evidence is available. The Sámi analysis is limited to Norway, Sweden, and Finland; it does not make claims about Sámi-language revitalization in the Russian Federation. Basque survey statistics cited here principally concern the Basque Autonomous Community and should not be generalized to the French Basque Country without separate evidence.

Documentary sources. The analysis uses published documentary evidence: legal texts and court decisions; government language strategies and administrative reports; censuses and sociolinguistic surveys; and peer-reviewed scholarship and scholarly books. Sources cited in the manuscript include the 2023 New Zealand Census material (Stats NZ, 2024), the Basque Government’s Seventh Sociolinguistic Survey (2021), Wales Census 2021 results (Office for National Statistics, 2022), Hawai‘i education materials, and scholarly analyses of Māori, Hawaiian, Welsh, Basque, and Sámi revitalization. Primary or official sources are used for law, policy, census and administrative claims; scholarly sources are used to interpret historical context, implementation and community processes. The analysis is a documentary synthesis, not a systematic review; no primary interviews or field observations were conducted.

Analytical procedure and comparability. Evidence described in each case was organized under the five LREM pillars and compared across cases using a common set of theory-informed indicators (Table 2). The assessment considers both institutional presence and evidence of implementation, reach or use, as appropriate to each pillar. The ordinal anchors in Table 3 were applied as qualitative guides to the case-level judgments shown in Table 4. A rating summarizes the strength and breadth of the documentary evidence; it is not a direct measure of language vitality or an estimate of causal effect. “Not rateable” (NR) is used where the cited evidence does not directly measure the construct, is insufficient, or is not comparable. In particular, self-reported speaking ability, school participation, and total speaker estimates are not treated as measures of parent-to-child transmission.

The source base varies by case in date, population, territorial coverage, and definitions of “speaker,” “proficiency,” and language use. Census and survey figures are therefore reported with their source-specific scope and are not treated as harmonized cross-case outcome measures. The speaker estimates in Table 1 are contextual descriptors only and do not determine the pillar ratings. Where an indicator is supported by uneven or indirect evidence, the case discussion and Table 4 should be read cautiously; the scores are ordinal profiles, not ranks.

Table 1 Case Selection and Context (descriptive, not a representative sample)

Case Study	Region	Language Family	Reported speaker estimate*	Governance Context	Primary Revitalization Driver
Te Reo Māori	Aotearoa / New Zealand	Austronesian	~215,000 (2023)	National government	Community-led (bottom-up)
‘Ōlelo Hawai‘i	Hawai‘i / USA	Austronesian	~27,000–33,000 (2020s)	US state government	Community-led (bottom-up)

Cymraeg (Welsh)	Wales / UK	Celtic (Indo-European)	~538,300 (2021)	Devolved government	State-led (top-down)
Euskara (Basque)	Basque Country / Spain & France	Language isolate	~750,000 (2021)	Autonomous regional government	Hybrid (grassroots + state)
Sámi Languages	Norway, Sweden, Finland	Uralic	~25,000–35,000	Cross-border (3 national governments)	Fragmented (multi-state)

*Estimates are reproduced as contextual figures from the cited case literature. Sources: Te Reo Māori (Stats NZ, 2024); ‘Ōlelo Hawai‘i (Maui News, 2025); Welsh (Office for National Statistics, 2022); Basque (Basque Government, 2021); Sámi (Saami Council, 2024). Dates, definitions, populations, and geographic coverage differ; the estimates are not harmonized, are not used as comparative outcomes, and do not determine the LREM ratings. The Sámi analysis covers Norway, Sweden, and Finland; the Basque survey cited principally covers the Basque Autonomous Community.

Table 2 Theory-linked indicators for evaluating the five LREM pillars

LREM pillar	Operational indicators assessed	Theoretical rationale (sources cited in this paper)
1. Legislative Architecture	Formal recognition and scope of rights; enforceable duties and planning institutions; implementation, stable public funding, and territorial/domain coverage.	Language policy includes management and practice (Spolsky, 2004); minority-language rights depend on institutional access to public domains (May, 2012). Recognition alone does not establish implementation.
2. Educational Infrastructure	Continuity from early-childhood through primary, secondary, adult, and tertiary provision; access and participation; educator capacity, curricula, and materials.	Education and biliteracy operate across intersecting contexts and domains (Hornberger, 2006); Basque research illustrates the importance of educational models and institutional conditions (Cenoz, 2009).
3. Community Agency and Ownership	Indigenous/community leadership and decision-making; community-controlled initiatives and spaces; sustained participation and evidence of local ownership.	Community-led language nests illustrate grassroots leadership (King, 2001); Indigenous leadership is emphasized in UNESCO (2021). Do not infer agency solely from demographic change.
4. Media and Digital Ecosystems	Availability and breadth of print, radio, and television; digital content/platforms and software; accessibility, reach, and coverage of relevant languages/varieties.	Media and domains shape language exposure and use (Hornberger, 2006); language revitalization requires attention to the wider sociolinguistic ecology (Grenoble & Whaley, 2006). Presence of one outlet alone is insufficient.
5. Intergenerational Transmission	Parent/caregiver-to-child language use; children’s acquisition and routine home/community use; continuity across age cohorts and new-speaker transmission.	Fishman (1991, 2001) places family and intergenerational continuity at the center of reversing language shift; EGIDS also foregrounds domains and transmission (Lewis & Simons, 2010). Ability or school enrollment alone is not transmission evidence.

Table 3 Ordinal scoring anchors

Score	Descriptor	Anchor for qualitative judgment
1	Minimal / fragile	Little documented capacity or isolated, highly fragile activity. Use only when evidence supports low capacity; missing data are not a low score.
2	Limited / emerging	Some identifiable provision or action, but narrow, fragmented, weakly resourced, inaccessible, or weakly implemented.
3	Established but uneven	A recognizable and sustained base exists, but reach, access, implementation, resources, or continuity remain materially uneven.
4	Strong, with identifiable gaps	Multiple substantial and sustained mechanisms show meaningful reach, while notable geographic, demographic, implementation, or continuity gaps remain.
5	Highly developed and broadly embedded	Durable, mutually reinforcing mechanisms are broadly accessible and implemented across relevant domains; this does not mean the language is safe or universally transmitted.
NR	Not rateable	Evidence is absent, indirect, insufficient, out of scope, or not comparable for a defensible rating. Report the gap rather than assigning a low score.

Scoring rule: Values are ordinal labels, not equal-interval measurements. They summarize qualitative judgments against the indicators and are not summed, averaged, or used to rank overall language vitality. The LREM's interdependence claim is interpreted through configurations and bottlenecks, not a compensatory total.

Comparative Case Studies

Te Reo Māori (Aotearoa / New Zealand)

The revival of Te Reo Māori is one of the most celebrated cases of indigenous language reclamation (from near extinction to a rapidly growing speaker base). Before European colonisation, Te Reo Māori was the only language of Aotearoa. After signing the Treaty of Waitangi in 1840, English-only educational policies and post-WWII urbanization disrupted intergenerational transmission so much that by the 1970s fewer than twenty percent of Māori could speak it fluently and the proportion of Māori children learning the language at home had dropped dangerously low (King, 2001).

The Māori revitalization movement has exceptionally strong Community Agency and Ownership (Pillar 3). In 1982 Māori elders created the first Te Kōhanga Reo (Language Nest) — an immersive early childhood environment where fluent elders taught preschoolers the language and culture. It was so significant because it was conceived, organised and operated by the Māori community itself — cultural self-determination that bypassed the state educational apparatus (King, 2001; Waugh, 2025). The Kōhanga Reo movement quickly spread across the country and required the establishment of Kura Kaupapa Māori (Māori-medium primary schools) and Wharekura (secondary schools), creating a complete Educational Infrastructure (Pillar 2) providing a continuous pathway for Māori medium education from early childhood through secondary schooling.

This bottom-up mobilisation eventually forced the state to provide formal Legislative Architecture (Pillar 1). The Māori Language Act 1987 made Te Reo Māori an official language and created the Māori Language Commission (Te Taura Whiri i te Reo Māori) but was followed by Te Ture mō Te Reo Māori 2016 which set up Te Mātāwai as a new entity to lead the revitalisation of the language on behalf of the Māori community (New Zealand, 1987; Ministry of Māori Development, 2016). Strong Media Ecosystems (Pillar 4), such as Māori Television (Whakaata Māori) launched in 2004 also increased public visibility and prestige of the language; it

broadcast all its programming in Te Reo Māori and normalised its use in contemporary media. These pillars work together: the 2023 Census showed over 200,000 people could speak Te Reo Māori (an increase of fifteen percent from 2018) (Stats NZ, 2024). But these successes are not yet complete as school fluency transitions to home Intergenerational Transmission (Pillar 5) — only 18.6% of people of Māori descent can hold a conversation in Te Reo Māori so the language has not yet returned home for most of the Māori population.

‘Ōlelo Hawai‘i (Hawai‘i / USA)

The trajectory of ‘Ōlelo Hawai‘i closely mirrors the Māori experience, demonstrating the power of grassroots agency in overcoming systemic linguistic suppression. Following the illegal overthrow of the Hawaiian Kingdom in 1893, the use of the Hawaiian language was explicitly banned in schools in 1896 (Spear, 2024). This de jure suppression, compounded by the social and economic pressures of Americanization, resulted in a catastrophic decline in speaker numbers. By the early 1980s, there were fewer than fifty native speakers under the age of eighteen, and total fluent speakers were estimated to be as low as six hundred, placing ‘Ōlelo Hawai‘i on the brink of extinction (Wilson & Kamanā, 2001).

Inspired by the Māori Kōhanga Reo, Hawaiian educators and activists founded the ‘Aha Pūnana Leo in 1983, establishing immersion preschools that exemplified profound Community Agency (Pillar 3). This initiative catalyzed the development of the Kula Kaiapuni (Hawaiian immersion K-12 schools), building a vital Educational Infrastructure (Pillar 2) that, as of the 2024–2025 school year, serves over 2,452 students enrolled in 22 schools across five islands (Hawai‘i State Department of Education, 2024). The Legislative Architecture (Pillar 1) supporting ‘Ōlelo Hawai‘i has evolved significantly over the decades. While a 1978 state constitutional amendment recognized Hawaiian as an official language, the legal mandate for immersion education was definitively established by the Hawai‘i Supreme Court in *Clarabal v. Department of Education* (2019). This landmark ruling affirmed the state's constitutional obligation to make all reasonable efforts to provide access to Hawaiian immersion education, effectively functioning as a form of cultural reparations rooted in the historical injustice of language suppression (Spear, 2024).

The integration of these pillars has yielded remarkable results. The number of individuals speaking Hawaiian at home grew from approximately 18,400 in 2016 to 27,338 in 2024, and broader estimates suggest the total speaker population reached approximately 33,000 by 2020—a dramatic increase from the estimated 600 speakers in 1982 (Maui News, 2025). However, the Media Ecosystems (Pillar 4) for Hawaiian remain comparatively underdeveloped when measured against the Welsh or Māori cases, and Intergenerational Transmission (Pillar 5) is still in its nascent stages. The Hawaiian case powerfully underscores that while Community Agency can initiate revitalization, robust Legislative Architecture is essential to secure and expand the necessary Educational Infrastructure for sustained growth.

Cymraeg (Wales / UK)

The revitalization of Cymraeg (Welsh) is a stark contrast to the Māori and Hawaiian cases because it shows how top-down institutionalization works. Welsh has been in decline under English political and cultural dominance for centuries (symbolized by the punitive “Welsh Not” in nineteenth-century schools where children who spoke Welsh were made to wear a wooden placard as punishment); but it has stabilized and grown (younger demographics) (Williams, 2014).

The Welsh model is based on strong Legislative Architecture (Pillar 1). The Welsh Language Act 1967 made provision for Welsh to be used in legal proceedings; the Welsh Language (Wales) Measure 2011 gave Welsh official status in Wales and established the Welsh Language Commissioner (United Kingdom, 1967; Welsh Government, 2011). This framework supports extensive Educational Infrastructure (Pillar 2), including Welsh-medium education (Ysgolion Cymraeg) and the teaching of Welsh in English-medium schools. The Welsh Government’s Cymraeg 2050 strategy, published in 2017, commits to a target of one million Welsh speakers by mid-century, nearly double the then-current speaker base (Welsh Government, 2017).

The Media Ecosystem (Pillar 4) is equally strong; in 1982 the Welsh-language television channel S4C was launched to normalise the language for modern broadcasting and became a powerful symbol of Welsh cultural identity. The Welsh-language nursery education movement Mudiad Meithrin also plays a major role early on in language acquisition. Yet, despite these institutional strengths the 2021 Census showed an overall decrease in Welsh speakers percentage from 19.0% (562,000) in 2011 to 17.8% (538,300) (Office for National Statistics, 2022). According to the Annual Population Survey (2024–2025) some 731,000 people (25.2%) have some Welsh-speaking ability but census self-reporting puts the figure at 646,000 (Welsh Government, 2026). This demographic complexity is a vulnerability of the Welsh LREM: educational and legislative pillars are strong but Intergenerational Transmission (Pillar 5) and Community Agency (Pillar 3) are weak in areas with high inward migration from England and where Welsh is seen as an academic subject rather than community vernacular. Wales shows that top down infrastructure is not enough to ensure intergenerational continuity without grassroots community engagement.

Euskara (Basque Country / Spain & France)

Euskara (Basque) is a pre-Indo-European language isolate with no known relatives that has experienced extraordinary demographic recovery after severe repression. During the Franco dictatorship (1939–75), public use of Euskara was strictly forbidden, and speakers were punished for using it in public spaces (Cenoz, 2009). The post-Franco period saw intense linguistic renewal because grassroots activism was combined with strong regional autonomy.

The Basque revitalization model is characterized by its strong Educational Infrastructure (Pillar 2). Ikastolak (Basque-medium schools) were started in the 1960s as a clandestine grassroots movement during Franco's regime and were the basis of what would become an extremely effective state-supported educational system (Heidemann, 2014). When the Basque Autonomous Community (BAC) was created in 1979, and the Statute of Autonomy followed, it became part of the regional government's formal tripartite education system (Model A: Spanish medium with Basque as a subject; Model B: bilingual; Model D: Basque medium with Spanish as a subject) (Cenoz, 2009). Today, Model D enrolls almost all students in the BAC and is the engine that creates new bilingual speakers. This success at the educational level is based on strong Legislative Architecture (Pillar 1) at the regional level which made Euskara a co-official language alongside Spanish (mandated use in public administration, education and signage).

The Community Agency (Pillar 3) that gave rise to the Ikastolak movement is still active, with literacy and Basque-language acquisition programmes run by HABE (Institute for Basque Language Literacy and Euskaldunization of Adults), as well as the Ulibarri programme promoting Basque use outside school in general (Basque Government, 2021). As a result, according to Seventh Sociolinguistic Survey of BAC population (aged 16 and over) carried out in 2021 (Basque Government, 2021) 33.9% are bilingual (Basque and Spanish) now compared to around 22% in 1991; but growth is strongest among 16–24 year olds where bilingualism rates are much higher — so education pillar does produce new generations of speakers; however, as in Wales it is translating this school-acquired competence into Intergenerational Transmission (Pillar 5) active in Spanish-speaking urban areas (the greater Bilbao metropolitan region) which remains the main challenge for Basque LREM. The language's Media Ecosystems (Pillar 4) are developing with Basque TV (ETB) and radio, but the competition is huge from Spanish-language media.

Sámi Languages (Nordic Countries)

The Sámi languages, spoken by the indigenous Sámi people across northern Norway, Sweden, and Finland (the geographic scope examined here), offer a complex case study of cross-border revitalization. There are nine extant Sámi languages, all of which are classified as endangered, with Northern Sámi being the most widely spoken (Aikio-Puoskari, 2018). The total Sámi population is estimated between 50,000 and 80,000, yet only an estimated 25,000 to 35,000 individuals speak a Sámi language, and the smaller Sámi languages have only a handful of speakers remaining (Saami Council, 2024).

The revitalization of Sámi languages is complicated by fragmented Legislative Architecture (Pillar 1). Legislation includes Norway's Sámi Act (1987), Finland's Sámi Language Act (2003), and Sweden's Act on National Minorities and Minority Languages (2009). These instruments recognize the Sámi as Indigenous peoples and their languages as minority or official languages within designated administrative areas; the level of legal protection, institutional support, and state funding varies across the national borders (Norway, 1987; Finland, 2003; Sweden, 2009; Aikio-Puoskari, 2018). This jurisdictional fragmentation impedes the development of a cohesive, pan-Sámi revitalization strategy and creates disparities in access to Sámi-language education and services depending on which country a Sámi individual resides in.

Despite these legislative challenges, significant strides have been made in Educational Infrastructure (Pillar 2). Inspired by the Māori Kōhanga Reo, Sámi language nests have been established in several communities, and institutions like the Sámi University of Applied Sciences (SUAS) in Kautokeino, Norway, play a vital role in developing academic Sámi, training educators, and conducting research in and about Sámi languages (Sámi University of Applied Sciences, 2024). However, the Media and Digital Ecosystems (Pillar 4) struggle to serve a linguistically diverse and geographically dispersed population across the three countries examined here, limiting the languages' utility in modern, cross-border contexts. While NRK Sápmi (Norway) and SVT Sápmi (Sweden) provide some Sámi-language broadcasting, the coverage is limited compared to the Welsh or Māori media landscapes.

The most critical vulnerability in the Sámi LREM lies in Intergenerational Transmission (Pillar 5). Research indicates that only a small proportion of Sámi individuals are highly fluent and use the language with their children—approximately 4% in Sweden and 11% in Norway (Lloyd-Smith, 2023). This low transmission rate is exacerbated by geographic dispersion across vast Arctic territories, small speaker populations for the minor Sámi languages, the overwhelming dominance of the national languages (Norwegian, Swedish, Finnish), and the historical trauma of assimilation policies. The Sámi case illustrates that while Community Agency (Pillar 3) and educational initiatives are present and growing, the lack of unified cross-border legislative support and the logistical hurdles of a dispersed population severely constrain the overall ecological health of the revitalization effort.

Cross-Case Analysis and Discussion

The Synergy of the LREM Pillars

The comparative analysis of these five cases offers a preliminary application of the Language Revitalization Ecology Model and illustrates patterns consistent with its proposition that revitalization involves interaction among multiple domains. No single pillar—whether it be robust legislation, dedicated community activism, or comprehensive schooling—is sufficient in isolation. The Māori and Basque case narratives illustrate how community initiatives, education, and institutional support can interact; the documentary evidence does not establish a common demographic outcome measure across all cases. In the Basque Country, the grassroots Community Agency that birthed the Ikastolak was seamlessly integrated into a formal Educational Infrastructure supported by regional Legislative Architecture, producing a steady increase in bilingual speakers over four decades. Similarly, the Māori Kōhanga Reo movement catalyzed national legislation and the development of comprehensive Media Ecosystems, creating a mutually reinforcing cycle of institutional support and community engagement.

The cases also illustrate potential vulnerabilities where pillars are uneven or disconnected, although the cross-sectional documentary design cannot establish that these conditions caused a particular outcome. The Sámi case narrative describes variation in legal arrangements across national borders and identifies coordination and media provision as potential challenges; the scale and effects of these differences require language- and country-specific evidence. The Hawaiian case narrative describes strong community-led activity and educational provision, while media and transmission evidence is less fully documented in the current source base. These differences are treated as provisional assessments rather than demonstrated constraints on long-term sustainability. The LREM directs attention not only to the presence of activity in individual domains, but also to the connections among community, school, state, media, and home.

A comparison of the Welsh and Māori cases highlights different institutional and community histories. The provisional profile in Table 4 suggests different configurations of legislative, educational, and community activity, but the available evidence does not establish that community agency explains changes in census counts. Census figures are affected by definitions, demographic change, and other contextual factors. The possibility that community-initiated pathways and state-led pathways produce different patterns of durability remains a hypothesis for longitudinal and community-validated research.

Table 4 Qualitative ordinal assessment of LREM pillar profiles (1 = minimal; 5 = highly developed; NR = not rateable)

LREM Pillar	Te Reo Māori	‘Ōlelo Hawai‘i	Cymraeg (Welsh)	Euskara (Basque)	Sámi Languages
Legislative Architecture	4	3	5	4	2
Educational Infrastructure	4	4	5	5	3
Community Agency	5	5	3	4	3
Media Ecosystems	4	2	4	3	2
Intergenerational Transmission	NR	NR	NR	NR	1

Note: Ratings are qualitative summaries of the documentary evidence presented in the case narratives and are provisional where source coverage is uneven. NR indicates that the manuscript does not provide a sufficiently direct and comparable measure for a defensible rating. The transmission ratings for Māori, Hawaiian, Welsh, and Basque are NR because the cited evidence presented here does not consistently measure parent-to-child transfer. The Sámi rating is retained from the reported estimates of language use with children (Lloyd-Smith, 2023); its population, language, and country coverage should be read as source-specific, not as a uniform rate across all Sámi languages. No composite score is calculated.

Top-Down vs. Bottom-Up Dynamics

A pattern across the cases is the interaction between community-led initiatives and formal institutions. In some settings, community initiatives preceded institutional support; in others, state policies and education systems have been prominent. The cases suggest reciprocal relationships, but do not establish one necessary sequence. The Hawaiian and Māori cases vividly illustrate that Community Agency (Pillar 3) is prominent in the Māori and Hawaiian accounts, particularly in contexts of historical state oppression where the government was the original agent of language suppression. Grassroots initiatives like the Pūnana Leo and Kōhanga Reo language nests were born out of urgent community necessity, operating outside—and sometimes in defiance of—formal state structures that had historically marginalized the indigenous language.

In the Māori and Hawaiian narratives, community initiatives were followed by formal recognition and public-sector involvement, which can support the continuity and scale of educational provision. The *Clarabal v. Department of Education* ruling in Hawai‘i and the successive Māori Language Acts in New Zealand represent the institutionalization of grassroots efforts, providing the legal mandates and state funding necessary for long-term viability. Without this institutional backing, community-driven programs remain dependent on volunteer labor and precarious funding, limiting their capacity to serve growing demand. Conversely, the Welsh and Basque models demonstrate that top-down legislation and state-funded education, while powerful tools for creating new speakers, must continually nurture grassroots Community Agency to prevent the language from becoming merely an academic exercise devoid of authentic community ownership. The change in Welsh census

counts should not by itself be interpreted as evidence of weak community agency or as a causal test of institutional policy; additional demographic, use, and transmission evidence is needed.

The Intergenerational Bottleneck

The case narratives raise the transition from school-based acquisition to home use as a potential bottleneck. However, direct parent-child transmission measures are not consistently available across all five cases, so this pattern should be interpreted as a hypothesis rather than a harmonized cross-case finding. Educational provision and bilingual ability do not by themselves demonstrate routine home use or parent-to-child transmission. The available indicators should therefore be kept distinct: where direct household evidence is unavailable, the relevant transmission cell is marked NR in Table 4 rather than inferred from school participation or speaker counts.

This distinction shows why education infrastructure alone cannot establish home use. Whether caregivers use a language with children may depend on economic utility, peer networks, community attitudes, and linguistic identity; these mechanisms require direct household or qualitative evidence. Interventions to overcome this bottleneck need to strengthen Community Agency and normalize the language in social and family settings (e.g., community language planning initiatives, family language programmes or social spaces where the indigenous language is default medium of interaction). Basque Ulibarri programme and Māori whānau (family) language planning initiatives are promising examples of such interventions, the available evidence supports treating parent-child transfer as an important concern, but does not justify ranking it as the greatest bottleneck in every case.

The Digital Imperative

Finally, the comparative analysis highlights the increasingly critical role of Media and Digital Ecosystems (Pillar 4) in the twenty-first century revitalization landscape. A language must possess utility and visibility in the digital sphere to remain relevant to younger generations, who increasingly conduct their social, educational, and professional lives online. The establishment of Māori Television (Whakaata Māori) and the Welsh broadcaster S4C were watershed moments that elevated the prestige and modern utility of those languages, demonstrating that indigenous languages could function effectively in the domain of contemporary media. For geographically dispersed populations like the Sámi, digital platforms offer unprecedented opportunities to connect speaker communities across vast distances, partially mitigating the challenges of physical separation and creating virtual language communities.

The LREM framework suggests that digital integration is no longer a supplementary luxury, but a core component of a healthy revitalization ecology. Languages that are absent from social media, mobile applications, and digital content creation risk being perceived as relics of the past rather than living, evolving systems of communication. Future revitalization strategies must therefore prioritize the development of digital content, the localization of technology interfaces, and the cultivation of online communities where the indigenous language is actively used and celebrated.

The Role of Historical Trauma and Decolonization

An additional dimension that emerges from this comparative analysis (but which is not articulated as a separate LREM pillar) is the role of historical trauma and decolonization narrative in motivating and sustaining revitalization efforts: In all five cases the decline of indigenous language was directly related to colonial or authoritarian policies of linguistic suppression (English-only education in NZ, 1896 ban on languages in Hawai‘i; Welsh Not in Wales; Franco’s prohibition of Euskara; assimilation policies against Sámi across Nordic countries). The recognition of this historical injustice has been an enormous motivator for Community Agency because language revitalization is no longer understood as cultural preservation but political resistance and collective healing.

The Hawaiian case is a good example of this. The Clarabal court's acknowledgement that the overthrow of the Hawaiian Kingdom and decades of language suppression were "part of the story" shifted the legal discourse from educational policy to reparative justice (Spear, 2024). It raised the moral urgency of revitalization and set a precedent for jurisprudence that may be followed elsewhere; Māori revitalization has been so closely linked with claims for indigenous sovereignty and Treaty of Waitangi rights that it carries political legitimacy far beyond language planning.

What this means for the LREM is that the socio-historical context in which revitalization takes place isn't just background information; it's an active force that determines intensity and character of Community Agency. Programs that can use the narrative of historical injustice and frame revitalization as decolonization may be stronger and more sustained than those that treat language preservation as technical or educational problem.

Limitations of the Study

Several limitations of this study should be noted. First, the pillar ratings are qualitative ordinal judgments; the indicators and scoring anchors improve transparency but do not make evidence from different countries, languages, or data systems fully comparable. Source coverage is uneven, and some existing ratings remain provisional. Second, the cases were purposively selected for analytic contrast and documentation, so the findings are not statistically generalizable and may underrepresent languages in contexts of extreme political marginalization, armed conflict, or state hostility. Third, the study synthesizes secondary sources and published data; primary, community-led fieldwork would provide a richer account of lived experience and could validate the interpretation of community agency and transmission. Fourth, this cross-sectional comparison captures a limited period in a revitalization process that unfolds over decades and generations.

CONCLUSION

To reverse the tide of indigenous language endangerment around the world we need analytical tools that describe the full scope of revitalization. This paper has introduced the Language Revitalization Ecology Model (LREM) and argued that language preservation depends on five interdependent pillars: Legislative Architecture, Educational Infrastructure, Community Agency, Media Ecosystems and Intergenerational Transmission.

The five cases illustrate the value of examining revitalization across interacting legal, educational, community, media, and family domains. As a purposive documentary comparison, they provide a preliminary application of the LREM rather than a causal test of the model. Community agency can be an important source of initiative, while legal and educational institutions can support continuity and reach. The comparison also underscores that school provision and policy do not automatically produce family transmission; direct household evidence and community-led validation are needed to assess that outcome.

For policymakers and indigenous advocates, the LREM is a diagnostic tool. Communities can see how their contexts fit into these five pillars and where structural vulnerabilities are, so they can better allocate resources — not just in one domain (education, for example) but throughout ecology, with attention to locally documented gaps. In the Sámi case, policy coordination and media provision are relevant concerns, but needs should be specified by language and jurisdiction rather than generalized across the group.

Future work should apply the LREM longitudinally to track how pillar profiles change as programmes and political contexts evolve; extend the comparison to less documented revitalization contexts; and test and refine the indicators through standardized longitudinal measures, language-specific data, and community-led validation. Such work could examine relationships between pillar configurations and language outcomes without treating the current ordinal profiles as quantitative causal measures.

The findings of this study also have practical implications for international organizations such as UNESCO (which is leading the International Decade of Indigenous Languages 2022–2032). LREM argues that global revitalization strategies should go beyond awareness-raising campaigns and documentation projects to address structural conditions that enable or constrain language recovery: i.e., international frameworks need to encourage

states to develop comprehensive language policies integrating legislative, educational, media and community dimensions rather than treating them as separate silos of policy.

Preserving indigenous languages is not just a linguistic issue — it's also a moral one: we have to preserve the irreplaceable diversity of human thought, knowledge and cultural expression for future generations because when a language dies so does a way of understanding the world (ecological knowledge, philosophical insight, artistic expression) that can never be recovered. The Language Revitalization Ecology Model provides a lens through which to understand and support this complex multi-dimensional work of keeping these languages alive so that the voices of indigenous peoples can be heard across generations.

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