Stakeholders' Perceptions on the Development of a Tshivenda Scientific Language Register for Teaching Agricultural Sciences

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Article Info	Abstract
	The South African government seeks to address the dominance of English and Afrikaans as the primary languages of instruction in most schools by promoting the use of indigenous languages as mediums of instruction. This initiative offers a significant opportunity for Black African learners to engage with subjects like Agricultural Sciences in their native languages. However, questions about the readiness and availability of teaching materials and resources in languages such as Tshivenda remain critical. This study planned to categories the stakeholders' perceptions in developing the Tshivenda scientific language register for animal studies. The data for this qualitative interpretative case study were collected through semi-structured interviews with two teachers and six parents, selected using purposive sampling techniques. Findings revealed initial skepticism among stakeholders due to the lack of Agricultural Sciences terminology in Tshivenda. However, with collaborative efforts and a growing positive attitude toward using indigenous languages, significant progress has been made.

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INTRODUCTION

South Africa recognizes twelve official languages, including Tshivenda, XiTsonga, SeSotho, SeTswana, SiSwati, SePedi, IsiNdebele, IsiZulu, IsiXhosa, Sign Language, English, and Afrikaans (Dada et al., 2023). However, English and Afrikaans have historically enjoyed a dominant educational status due to colonial and apartheid legacies that prioritized them at the expense of other languages (Diko, 2023). To address this imbalance, the South African government has initiated efforts to introduce indigenous languages as mediums of instruction in schools (UNESCO, 2022). This shift presents a significant opportunity for Black African learners to engage with subjects like Agricultural Sciences in their native languages. Nevertheless, questions about the readiness and availability of teaching and learning resources in indigenous languages remain pressing (Ntuli, 2022).Language plays a fundamental role in shaping human identity, preserving traditional societies, and facilitating human and social interactions (Ndem et al., 2020). It serves as a vehicle for acquiring knowledge, fostering understanding, and enabling self-expression (Carstens, 2016). However, many learners in rural areas face significant challenges in grasping scientific concepts due to language barriers in science education. These challenges include difficulties in understanding specialized vocabulary and adapting to new scientific terms, which hinder both learners and teachers in fostering scientific language proficiency (Smith-Walter et al., 2016).

Despite South Africa's linguistic diversity, the development of scientific language registers in indigenous languages remains limited. This gap restricts meaningful engagement with critical subjects like Agricultural Sciences among native speakers (Phalandwa, 2023). Amid these challenges, a crucial question arises: Are we prepared to learn Agricultural Sciences in our mother tongues? Addressing this question requires a critical assessment of the availability of teaching and learning resources in indigenous languages (Mapelo & John, 2021). Although South African learners speak a wide variety of languages, English and Afrikaans continue to dominate as the primary languages of instruction in most schools (Desai, 2016).The National Department of Education's Language-in-Education Policy (LiEP) empowers School Governing Bodies (SGBs) and parents to select the Language of Learning and Teaching (LOLT) from Grade 3 onwards (Department of Education, 1997). Consequently, many parents and SGBs opt for English as the LOLT.

English continues to dominate as the primary language of teaching and learning across most primary, secondary, and tertiary institutions (Diko, 2023; Desai, 2016; Klapwijk & Van der Walt, 2016). Beginning in Grade 4, the Language of Learning and Teaching (LOLT) typically shifts to English, with local languages relegated to being taught as subjects (Wildsmith-Cromarty & Balfour, 2019). Research indicates that the implementation of the Language-in-Education Policy (LiEP) (DoE, 1997) has faced significant challenges, partly due to inadequate literacy teaching practices in indigenous languages (Wildsmith-Cromarty & Balfour, 2019). The South African educational context continues to grapple with numerous challenges related to the teaching and learning of indigenous languages (Ndebele, 2022), primarily due to a lack of teaching and learning materials in African languages such as Tshivenda (Shiora, 2019).

These challenges raise critical questions about learners' ability to comprehend scientific language when many already struggle to understand English. Science itself has a specialized language, with unique grammar and vocabulary that can further complicate learning (Helmenstine, 2019; Hewitt-Bradshaw, 2012). Some teachers argue that using English as the LOLT causes learners to lose touch with their home languages, resulting in gaps in content understanding (Kretzer & Kaschula, 2020). Teaching and learning materials are still predominantly prepared in English, with little to no provision for African languages, making the implementation of indigenous languages in education a formidable challenge (Ndebele, 2022).

This study focused on developing a scientific language register in Tshivenda. Tshivenda is a bantu language and an official language of South Africa, mainly spoken by venda people in Limpopo province, northern part of South Africa (Netshisaulu & Nyoni, 2021). According to Yule (2020), a register is a specific way of using language that is contextually appropriate, which can be classified as Situational (e.g., in church), Occupational (e.g.,

among lawyers), or Topical (e.g., discussing languages). Kabellow et al. (2019) found that teachers and learners often use non-standard forms of English during classroom interactions. These non-standard forms of English have been shown to facilitate language learning and acquisition among learners when used in English language classrooms. In professional settings, colleagues in the same occupation often develop specific registers to communicate effectively within their group, excluding outsiders. This specialized use of language not only fosters clear communication but also helps individuals identify with their group and maintain solidarity (Kabellow et al., 2019). This study aimed to explore stakeholders' perceptions of using a scientific language register in Tshivenda for teaching Agricultural Sciences. It sought to understand how this register could enhance teaching and learning while promoting linguistic inclusivity and group identity within educational contexts. In this study the developed scientific language register was to add on the shortage of teaching and learning materials for teaching Agricultural Sciences in Tshivenda, to support learners with challenges in understanding English.

Mutase (2015) highlighted that parents often view English proficiency as a valuable skill for the job market and a critical factor for their children's future success. Parents' perspectives on the education system are crucial, as they are essential stakeholders in their children's learning process (Donald et al., 2010). However, research indicates that many schools frequently opt for English as the medium of instruction (Gordon, 2019; Kola, 2018). As a result, learners are required to transition to English as the language of learning and teaching (LOLT) from Grade 4 onward. Similarly, Kufakunesu (2019) noted that negative attitudes toward indigenous languages among parents are often mirrored by their children, with many learners perceiving English as the key to success and a solution to socio-economic challenges. Furthermore, the lack of teaching and learning materials in indigenous languages is a significant factor influencing parents' preference for English as the LOLT, as instructional resources are predominantly prepared in English, with limited provision for African languages (Mapelo & John, 2021).

Research also indicates that poor academic performance and high dropout rates are more prevalent among learners whose home languages are not used as the medium of instruction (UNESCO, 2022). Therefore UNESCO (2022) emphasizes the importance of delivering education in a child's native language, noting that it improves learning outcomes, preserves linguistic diversity, and ensures that indigenous knowledge, deeply embedded in indigenous languages, is passed down to younger generations. This study seeks to explore and categorize stakeholders' perceptions regarding the development of a Tshivenda scientific language register for teaching animal studies. The study was guided by the following research question: What are the stakeholder's perceptions in developing the Tshivenda scientific language registers for animal studies. The researcher asserts that learners' academic success and achievements are strongly tied to the language of instruction. Therefore, teac,hing Agricultural Sciences in Tshivenda is a worthwhile endeavour that could enhance learning outcomes and foster a deeper connection with indigenous knowledge. This study aligns with the national agenda of promoting linguistic inclusivity and educational equity, offering insights into the potential and challenges of integrating indigenous languages into science education. The researcher asserts that this effort would enhance learners' comprehension of subject content by utilizing their native languages, thereby promoting equitable and inclusive education.

Previous studies has been conducted towards Mother tongue based education, Malindi et al. (2023) inclined mother tongue based education as the use of home language in teaching and learning process, their studies further indicated that mother tongue instruction links one identity, culture, history and heritage to one's personality (Malindi et al. 2023). The study by Nishanth (2020) proclaims that mother tongue is important in framing people thinking and emotions in enhancing cognitive development and support learning. With the entire positive attitude towards the use of mother tongue, the development of scientific register in Tshivenda to support learning in mother tongue remained unexplored. However the developed Tshivenda scientific language register has represented a pioneering effort to address the dearth of linguistic

resources in indigenous languages, specifically tailored for the teaching of Agricultural Sciences

METHODS

The primary objective of this study was to categorize stakeholders' perceptions regarding the development of a Tshivenda scientific language register for animal studies. By adopting a qualitative approach, the researcher engaged directly with participants, fostering collaboration and gaining deeper insight into their perspectives during data collection (Creswell & Creswell, 2022). This approach was instrumental in addressing the research question: What are the stakeholders' perceptions of developing a Tshivenda scientific language register for animal studies?

A case study design was employed to achieve a comprehensive and detailed understanding of specific cases, focusing on examining them within their lived contexts (Priya, 2021). Each school involved in the study functioned as a distinct case, allowing the researcher to explore participants' perceptions about using Tshivenda as the medium of instruction for Agricultural Sciences. This methodology provided nuanced insights into the challenges and opportunities associated with

implementing indigenous language registers in education.

In this study, purposive sampling was employed as a non-probability sampling technique, allowing the researchers to use their judgment in selecting participants who could provide meaningful insights into the research problem (Foley, 2018). This method enabled the researchers to identify participants and sites that contributed to a deeper understanding of the phenomenon under investigation (Creswell & Poth, 2018). The sample included two Grade 10 Agricultural Sciences teachers from two different schools, two groups of Grade 10 learners, and three parents from each school. The study was conducted in the Vhembe East district of the Limpopo Province, focusing on the perspectives of these stakeholders regarding the development of a Tshivenda scientific language register.

The study focused on two male Grade 10 Agricultural Sciences teachers from two different schools within the same circuit, along with Grade 10 learners and three parents from each school. To protect the identity of the participants, pseudonyms were used, and their names were not disclosed. The qualifications and experiences of the teachers are outlined in Table 1 below.

Table 1. Teacher's qualifications and the experiences

Cases	Participants pseudonym's	Gender	Qualifications	Overall teaching experiences in years	Teaching experience in Agricultural Sciences grade 10
Case 1	Muri	Male	STD, ACE	23	20
Case 2	Mpho	Male	BEDFET	4	4

In this study, data were collected through semi-structured interviews. Semi-structured interviews allow the researcher to probe further when a participant's response is unclear (Ntseli, 2020). This approach facilitated open-ended responses, enabling participants to fully express their views. Follow-up questions were asked based on participants' initial answers to seek additional clarity and gather more in-depth data. All interviews were audio recorded with participants' consent to ensure the reliability of the data and to prevent any misinterpretation during the data analysis process. The interviews were conducted face-to-face.

Observation is the process of gathering open-ended, first-hand information by watching people and places at the research site (Creswell & Creswell, 2018). Maree (2019) highlights observation as a valuable tool for researchers to gain deeper insights and understand the observed phenomenon, providing an insider's perspective on group dynamics and behaviours in various settings. Given the qualitative nature of the study, the researcher observed the teachers' lessons in the classroom, acting solely as an observer and not as a participant. Three Tshivenda lessons and three English lessons delivered by each teacher using both English and Tshivenda registers were observed, observing how

the teacher used both registers and how learners interacted while learning in both languages. The lessons were recorded and videotaped to prevent data misinterpretation and were later transcribed and analysed.

Since the researcher was also an observer in the classroom, in order avoid the potential biased the study employed triangulation. Interviews, classroom observations and diary were used as the data collection instruments. The diary documented diverse facet, such as the challenges encountered during the creation of registers and strategies implemented to tackle them. Additionally, reflections on the register by different stakeholders and any insights contributing to its development were recorded in the diary.

Following data collection, the researcher used content analysis to examine the information obtained from participant's interviews, audio recordings and observations to understand the information gathered, the audio recordings of interviews and observations were transcribed, coded and carefully examined several times. Data from audio-taped interviews were examined by playing them again several times; writing up the transcriptions and listening to the audio recordings again to make sure the responses matched those of the participants. Before the data was finalised, participants had the chance to check the transcribed data and provide comments and corrections. Instead of focusing on the overall population the study only looked at two grades 10 Agricultural Sciences teachers who were chosen from two secondary schools in the same circuit, 3 parents in each schools and class of learners in groups. By using this chosen strategy, the researcher was able to save expenses and effectively handle the data gathered, guaranteeing accurate and clear results. The selection method focused only on people whose viewpoints were crucial for answering the study research questions in order to prevent generalization.

In this study both teachers endorsed the use of Tshivenda for teaching and learning Agricultural Sciences and indicated by their responds. Muri commented that utilizing Tshivenda as the medium of instruction boost learners confidence in answering questions. While Mpho pointed out that when English is used as the medium of instruction for teaching Agricultural Sciences, learner's encounters some difficulties in grasping concepts. Their impression was anchored according to Ogunniyis (2019) stating that there may be difficulties when explaining scientific ideas in a language different than the learners' mother tongue.

Some parents argues that teaching Agricultural Sciences in Tshivenda will enhance their children's educational experience because they think that learners will comprehend the material better when it is taught in their home language. Maluleke (2019) summarizes their view points, emphasizing that using the learner's mother enhances academic achievement and encourages higher participation in classes. On the other hand, parents supporting the use of English for teaching and learning Agricultural Sciences contend that because English is so widely used in higher education it ought to be the language of choice. According to their viewpoints which are expressed by Mutase (2015) their children's success depends on their ability to speak English.

Learners' opinions on the usage of Tshivenda in Agricultural Sciences instruction differ. Some learner's ague that they should be taught and evaluated in their mother tongue because they have challenges in understanding English-language questions. This is supported by Ramothwala et al. (2022) who emphasizes that learners must actively participate in answering questions in order for teaching and learning to be meaningful and this is made easier when instruction is given in the learners native tongue. Some learners favour English, highlighting how crucial fluency is the language in winning international scholarship. The perspectives of these learners are consistent with the findings of Mapelo and John (2021) who noted that although learners show comprehension when instructed in their mother tongue there are still issues with uncertain professional routes following graduations. The researcher utilized a table containing Themes, Categories and Characteristics to analyse and interpret both the collected data and the findings of the study.

Table 2. A table containing themes, categories and characteristics.

Theme	Category	Characteristics
The development and applications.	Stakeholders perceptions	To understand how different stakeholders perceive the development and application of Tshivenda language register (Teachers, Parents and Learners.

The perceptions from two teachers, six parents and learners were categorised and analysed using content analysis to understand the participant's views and opinions on the use of Tshivenda for teaching and learning Agricultural Sciences.

RESULTS AND DISCUSSION

The results of each case were presented separately, with each school serving as an individual case study. The study also maintained the authenticity of the research by directly quoting the participants statements. This approach was to eliminate any uncertainty regarding the credibility of provided data. Additionally all participant responses were presented in italics to emphasize that these were exactly participants perspectives rather than the researcher.

Case 1: Muri From Muswiri High School
Stakeholders Perception
Teacher

In South Africa, most parents choose English as the Language of Learning and Teaching (LoLT) from grade 4 onwards (Gordon, 2019). This decision is largely due to the lack of teaching and learning materials available in African languages (Ntuli, 2022). In developing the Tshivenda scientific language register, the researcher sought to understand teachers' perceptions regarding the choice made by parents to switch to English rather than using their home language. Muri, a teacher from Muswiri High School, shared the following perspective:

"My perception is that it will be good to teach Agricultural Sciences in Tshivenda because learners will understand the lesson clearly." Muri

According to the teacher, there is support for using Tshivenda as the medium of instruction for Agricultural Sciences. In this study, Muri, the teacher from Muswiri High School, further elaborated on this perspective during the interview:

"If we are teaching in English, they found it difficult hence they would be a negative impact on learning, but if they are taught in Tshivenda it become easy for them to understand what is being taught." Muri

Parents

There are other parents who continue to uphold the view expressed by Mutase (2015) that English is key to their children's success. They remain convinced that the job market favours those who are fluent in English. This belief was reflected by Parent 2, who stated:

"Zwau funza Agricultural Sciences nga Tshivenda zwingasi shume ngauri habe a tshiswika hangei zwikoloni zwa ṋṱha hukhou toḓea tshikhuwa (Teaching Agricultural Sciences in Tshivenda will never work because in tertiary institution the is a need of English)." P2

Other parents expressed support for using Tshivenda to teach Agricultural Sciences. This was reflected in the following response from Parent 1:

"Nne ndivhona unga hezwi vhana vhatshi khou fuziwa nga Tshivenda ndi zwone zwavhuḓi ngauri vhaḓo kona u pfesesa na mudededzi (I think it will be best if learners are taught in Tshivenda because they will be able to understand the teacher)." P1

Learner's

The researcher not only considered the perceptions of teachers and parents, but also those of the learners. The learners expressed that although they struggle to understand English, they still prefer to be taught in English. When asked why they prefer English over Tshivenda, this is what they stated:

"For us in the future if we manage to secure a scholarship to go to other country, even though

Tshivenda is easy to understand but we still prefer to be taught in English even though we don't understand it." L1

Learners in Group 2 supported the use of their home language for learning. This is what they had to say after being taught using the Tshivenda scientific language register:

"Zwiṅwe zwa zwithu zwe ravha risongo kona u zwipfesesa nga tshikhuwa musi hutshi vho funziwa nga Tshivenda ro kona uzwi pfesesa (Some of the concept that we fail to understand in English, we manage to understand them in Tshivenda, we

manage understand them when we were taught in Tshivenda)" L1

"Tshinwe tshiḟhinga arali ritshikhou tou ṅwala test ri a misunderstand questions like ngori I kha English, sometimes a ri I pfesesi zwinga ita arali ra ṅwala nga Tshivenda (Sometimes if we are writing a test we misunderstand questions asked in English, it will be better if we write in Tshivenda)." L2

Table 3 indicates the theme that emerge from partipants perspections in case 1.

Table 3. The theme that emerge from partipants perspections in case 1

Theme	Teacher	Parents	Learners groups
Support for Tshivenda Challenge with English Perceived benefit for learning in Tshivenda.	Support Challenges identified Benefit perceived	Some parents support. Challenges identified Some parents perceived benefit	Some learners support. Challenges identified Some learners perceived benefit

Case 2: MPHO From Munngo Secondary School
Stakeholders Perceptions
Teacher

During the interview with the teacher, the researcher sought to understand the teacher's perception of using Tshivenda to teach Agricultural Sciences. This is what Mpho from Munngo Secondary School shared:

"I think it would be good idea to introduce Tshivenda as the language of teaching Agricultural Sciences. The reason for that is that many times when learners have difficult, that is the language they normally switch to so that we can explain terms that are difficult to the learners, and also it is the language that they easily understand in this school." Mpho

From the above response, the teacher supports the use of Tshivenda and believes it will help learners better understand the content. The teacher also discussed the impact of language on learners' performance in Agricultural Sciences, and this is what Mpho shared:

"Yes the language that is used to teach Agricultural Sciences has an impact. Since it is not the common

language that the learners use even outside the classroom or home, it becomes difficult for the learners to understand what they are learning but if we change then the learners is going to improve." Mpho

Parents

The perceptions from the teacher aligned with those of the parents, as they also agreed that using Tshivenda to teach Agricultural Sciences would benefit their children. This is what Parent 1 shared:

"Vhupfiwa hanga ndi ha uri ṅwana uḓo kona u pfesesa zwine mudededzi a khou amba zwone, zwine mudededzi avha atshikhou mufunza zwone nga luambo lwawe lwa ḓamuni.Reason ndi ya uri musi a tshi khou shumiseliwa tshikhuwa hakoni u pfesesa u fana na luambo lwa we lwa ḓamuni.(My percptions is that learners will understand what is being taught by their teacher if there using their home language, the reason being that when the lesson is in English learners fails to understand, unlike if the lesson is in their own language)" P1

The researcher further inquired about the language the parent would prefer for their children's education, and this was their response:

"Ndi nga takalela uri a funziwe nga luambo lwawe lwa ḓamuni, ngauri zwoṱhe zwine zwa ḓovha zwikhou funziwa uḓo kona uri a zwipfesese ngauri vhaya kona uri vha ambedzane tshiṅwe na tshinwe tshine vhakhou mufunza ngatsho, uya kona u vhudzisa vhakona u muṱalutshedza, ndiuri a ambe nga luambo lwawe lwa ḓamuni fhedzi. (I would prefer them to be taught using their home language, as there able to understand what is being taught, and also they are able to interact with their teacher and all that is being taught, also asking questions become easy when learners are using their home language)." P2

Learners

The responses from the learner interviews revealed that learners had a positive attitude toward the use of Tshivenda for teaching Agricultural Sciences. They indicated that when their teacher uses Tshivenda, they can understand better, which aligns with the findings of Ndebele (2022). Below is a response reflecting the perceptions of learners in Group 1:

"Nṋe ndinga amba uri zwikhwine ngauri vhunzhi ha vhana vhaya balelwa nga u amba English, musi vhatshi khou funziwa nga Tshivenda ndihone vhatshi pfesesa khwine. Ngauri vhana

vha fhano vha amba Tshivenda, vhunzhi havho avha dzuleli u amba tshikhuwa. (What I can say is that it will be better, because majority of us are unable to speak in English, and when we are taught in Tshivenda is then that they understand better, because most of us in this school we speak Tshivenda in most cases and not English)." L1

Both teachers and learners seemed to share the same view on using Tshivenda for teaching Agricultural Sciences. When learners in Group 2 were asked in an interview if they faced challenges in learning Agricultural Sciences in English, this is what they stated:

"Ee ria ṱangana na vhuleme ngauri English ari ngo toi ḓowelesa nga uto ralo, ngauri mahayani vhabebi vhashu vha amba na riṋe nga Tshivenda na fhano tshikoloni sometimes vhadededzi vhaamba na rine nga Tshivenda. (Yes we do experience some challenges because we are not used to speak in English, because at home we use Tshivenda to communicate with our parents, even here at school, our teachers sometimes communicate with us using Tshivenda)." L2

The learners' responses indicated strong support for the initiative of using Tshivenda to teach Agricultural Sciences, as they expressed that they are not accustomed to speaking in English.

The table 4 below indicates the themes that emerge from participant's perceptions in case 2.

Table 4. The themes that emerge from participant's perceptions in case 2

Theme	Teacher	Parents	Learners groups
Support for Tshivenda	Support	Support	Support
Challenge with English	Challenges identified	Challenges identified	Challenges identified
Perceived benefit for learning in Tshivenda.	Benefit perceived	Benefit perceived	Benefit perceived

This study focused on Animal Studies, one of the topics in Grade 10 Agricultural Sciences. Probyn (2015) suggests that learners who struggle to understand sciences perform better when given the opportunity to work on their language. Muri, the teacher from Muswiri High School, supports Ogunniyis' (2019) assertion that scientific language can become an obstacle when taught through a language other than the learner's home language.

This aligns with the findings of Kinyaduka and Kiwara (2013), who reported that both parents and teachers acknowledge the benefits of using the mother tongue in education, yet they still prefer English as the medium of instruction. This preference could be due to the underdevelopment of most indigenous languages in the education system (Netshivhumbe, 2022). While some parents opposed the use of Tshivenda for teaching Agricultural

Sciences, others saw it as a relief, as their children would better understand the teacher's instructions (Francis & Eucharia, 2019). Learners in Group 2 expressed that when lessons are conducted in their home language, they understand the content better. From their responses, they support being taught in Tshivenda, as it helps them grasp concepts they struggle to understand in English. This is supported by Sibongile and Ansuries (2021), who argue that limited exposure to the home language hinders effective teaching and learning. Despite some parents supporting the use of Tshivenda, others remain in favour of continuing with English as the language of instruction.

This study only focused on animal studies within a specific subject which is Agricultural Sciences in grade 10 across two different schools. Consequently, further research and development of more scientific language registers are encouraged, encompassing additional topics to ensure comprehensive coverage and developing supplementary teaching materials in Tshivenda.

CONCLUSION

The findings from this study reveal a generally favourable attitude among teachers towards using Tshivenda for teaching Agricultural Sciences, particularly in the context of animal studies. Teachers highlighted that when learners are taught in their native language; comprehension improves, leading to better academic outcomes. However, parental perspectives were divided. Some parents expressed reluctance, citing the lack of Tshivenda as a medium of instruction in tertiary institutions, and anticipated challenges for students transitioning to higher education. On the other hand, other parents supported the use of Tshivenda, arguing that teaching in the home language would enhance learners' understanding of the subject matter. Among learners, opinions were also mixed. Some supported Tshivenda instruction, expressing concerns about their future in English-speaking environments, despite their limited proficiency in English. Others saw Tshivenda instruction as beneficial, believing it would improve their understanding and, ultimately, their performance in Agricultural Sciences assessments. With different stakeholders stating different perspectives, this highlights the persistent challenges towards learners with language barrier and underscores the necessity for continued effort to promote the use of Tshivenda as a teaching and learning language. Therefore additional scientific language registers should be developed across various languages and subjects, expanding existing resources and enhancing the availability of scientific terms in indigenous languages. Also teacher training programs to emphasize the acquisition of skills required for developing indigenous language registers should be enhanced, focusing also in other topics in Agricultural Sciences.

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