Assessing the Implementation of FAIR and CARE Principles in Libraries of Assam

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Abstract

This study addresses the implementation of FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective benefit, Authority to control, Responsibility, Ethics) principles in managing the indigenous knowledge within libraries of Assam. Through review of literature and surveys using questionnaires, it assesses the current status of indigenous knowledge management in surveyed libraries. The study also appraises the integration of FAIR and CARE principles in Acquiring, Preserving, and Disseminating Indigenous Knowledge dataset. The findings from the study highlight the challenges faced by libraries such as limited access to knowledge, limitation of funding, lack of specific protocols/guidelines, and insufficiently trained staff to handle ethical and cultural concerns. The study also offers recommendations to enhance the implementation of FAIR and CARE principles for preserving and disseminating Indigenous knowledge effectively.

Keywords: Indigenous Knowledge, FAIR, CARE

1.   Introduction

Indigenous knowledge is a type of knowledge that is derived from a specific community or group. Each community has its unique way of performing things, which is influenced by its history, society, and culture. This knowledge is transferred from one generation to the next within the community through different methods such as language, customs, farming practices, healing techniques, culinary traditions, and crafts. Scholars have varying views on Indigenous Knowledge. According to Settee (2011), the term "Indigenous knowledge" refers to the knowledge that has supported Indigenous cultures for millennia. This inherited knowledge comprised the conventional types of knowledge created by earlier generations in respect to modes of knowing, connections/codes of conduct, and knowledge that aided in daily life. According to Gadgil. et al (1993) defined indigenous knowledge as a collective body of knowledge and beliefs passed by generations to generations through cultural communication about the relationship of living beings, (including humans) with each other and with their environment.

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1.1 Types of Indigenous Knowledge

Indigenous knowledge includes various types that are integral to Indigenous cultures and societies which are mentioned below:

❖ **Indigenous knowledge of Music**

Lepofsky et. al (2020) expressed their thought on indigenous music: that the music carries the word of the ancestors across time, transmitting key knowledge from deep in our sacred memory.

❖ **Indigenous knowledge of Dance**

Cakir (2023) illustrates that dances inherited from ancestors are learned and taught, the author also explains that the dances serve as a link between our historical past and present and that we should correctly pass them down to the next generations without losing or damaging its attributes.

❖ **Indigenous knowledge of Agriculture**

According to Hamadani et.al (2021) indigenous agriculture provides numerous advantages, including enhanced soil fertility, carbon sequestration, resource utilization, biodiversity preservation, sustainability, and environmental protection. Conveyed rather, the process of slash-and-burn activities in shifting agriculture also creates hazards to the environment.

❖ **Indigenous knowledge of Medicine**

According to Das & Sarkhel (2016) "traditional medicine" refers to medical practices, theories, methods, and beliefs that use manual techniques, exercises, spiritual therapies, and medications derived from plants, animals, and minerals alone or in combination to treat, detect, and prevent disease or maintain health.

❖ **Indigenous knowledge of Handicrafts**

Ndlangamandla (2014) describes traditional handicrafts as being made and imbued with indigenous knowledge, skill, and innate design ability for use. Handicraft skills are acquired mainly through informal practices, putting indigenous knowledge and its transmission at the centre of this activity.

❖ **Indigenous knowledge of Food**

These food systems involve harvesting, foraging, hunting, fishing, and gathering plant and animal foods. They are often influenced by a variation of eating habits, environmental factors, geographic differences, and socio-cultural as well as historical influences (Kuhnlein et al., 2013).

1.2 FAIR and CARE

The FAIR Data Maturity Model Working Group, under the Research Data Alliance, gained approval for its activities in September 2018. Its main goal was to create a standardized set of criteria applicable to all existing methods of implementing FAIR Data Principles also set the definition of FAIR principles. The CARE principles

were drafted at the Indigenous Data Sovereignty Principles for the Governance of Indigenous Data Workshop, co-hosted by the International Data Week and the Research Data Alliance Plenary on 8 November 2018 in Gaborone, Botswana. FAIR is the acronyms stands of Findable (availability of metadata, allow to search ability, persistent ID's) Accessible (use web protocols for access, allow for authorization, digital inclusion or exclusion) Interoperable (data integration, overcome data silos, IIIF for visual media) Reusable (license content, avoid data becoming lost). The principle "CARE" stands for Collective benefit, Authority to control, Responsibility and Ethics

According to Global Indigenous Data Alliance (2019), basically the CARE principles harmonize the FAIR principles by accentuating the importance of considering people and purpose in indigenous data governance. While FAIR promotes open data sharing, CARE highlights the need to empower Indigenous communities, respect their rights, and prioritize collective benefit and self-determination.
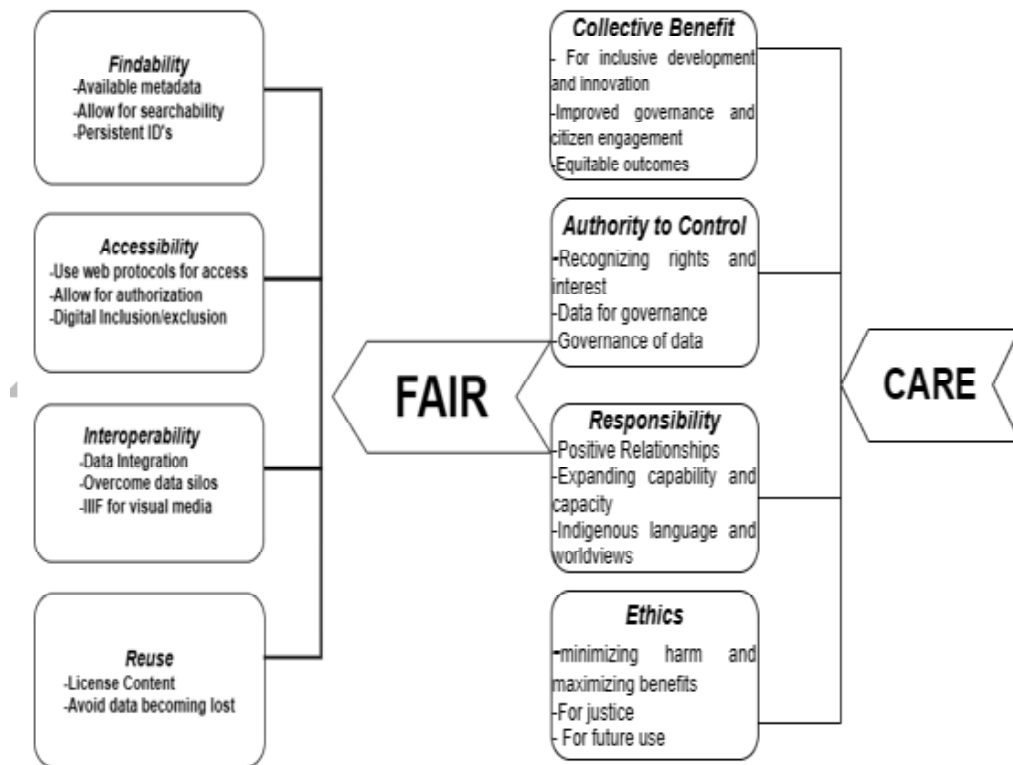
Figure-1: Definition of FAIR and CARE Principles by Research Data Alliance

Figure 1 depicts the definitions of the FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility, Ethics) principles as defined by the Research Data Alliance (RDA). The FAIR principles emphasize data "Findability" through metadata and unique identifiers, "Accessibility" where web protocol use for access, "Interoperability" through standardized formats, and

"Reusability" with clear usage of licenses and attribution. The CARE principles prioritize ethical data management for collective benefit, ensuring data benefits communities. "Authority to Control" underscores the rights of data subjects and creators to control access and use of their data. "Responsibility" mandates handling data with integrity and reliability. "Ethics" mandates adherence to ethical standards and guidelines in data collection, storage, and dissemination.

1.3 Role of FAIR and Care Principles in Library and Information centres in Acquiring Indigenous Knowledge

The FAIR (Findable, Accessible, Interoperable, and Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility, and Ethics) principles play important roles in the context of acquiring Indigenous knowledge in library and information centres.

According to Owiny et al. (2014) in developing countries acquiring indigenous knowledge, its preservation, and dissemination become essential practices. Carroll et al. (2020) observed that integrating the CARE principles alongside the FAIR principles leads to data that accurately signifies indigenous perspectives, serves indigenous needs, maintains indigenous oversight, and facilitates knowledge exploration and advancement. Librarians play an important role in standardizing data formats and metadata, facilitating smooth data integration. Ensuring comprehensive documentation and appropriate licensing for Indigenous knowledge supports its reusability without constraints, promoting extensive access and utilization by diverse audiences (Chigwada and Ngulube, 2023)
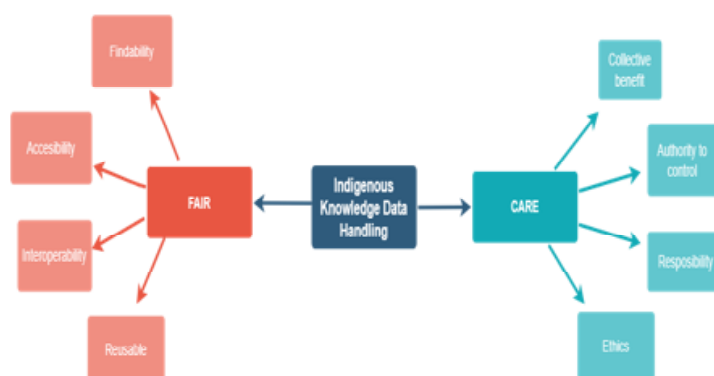
Figure-2: Indigenous Data Handling with FAIR and CARE Principles

Figure 2 illustrate that how indigenous knowledge data handling involves integrating FAIR and CARE principles while valuing cultural protocols and authority. FAIR principles ensure Indigenous knowledge is findable through appropriate metadata and identifiers, accessible while respecting community protocols, interoperable with diverse data systems, and reusable with consent and benefit sharing. CARE principles

emphasize respecting Indigenous rights to control data, handling it responsibly with integrity and accuracy, and adhering to ethical guidelines that prioritize community benefit and cultural understanding throughout the data lifecycle. Assessment these principles respect indigenous sovereignty and enhance the value and ethical use of Indigenous knowledge data.

2. Objectives of the Study

The main objectives of the study are presented as follows.

❖ To identify the types of Indigenous knowledge acquired in the libraries of Assam.

❖ To access the awareness and understanding of FAIR and CARE principles among the library staff in selected libraries of Assam.

❖ To investigate how selected libraries, implement FAIR and CARE principles in the management and dissemination of Indigenous data.

❖ To determine the challenges faced by libraries in the acquisition, preservation, and dissemination of indigenous knowledge in the digital era.

3. Methodology

A surveyed method was conducted to understand how libraries of Assam are involved in acquiring, preserving, and disseminating indigenous knowledge. The study focused on three types of libraries: special, public, and academic.

For sampling, this study employed purposive sampling method to select a total of 5 librarians, each representing different types of libraries. Among these, one librarian was chosen from an academic library, specifically Dr. S. K. B Library at Cotton College. Additionally, three librarians were selected from special libraries, including the Anundoram Borooah Institute of Language Art and Culture (ABILAC), the Directorate of Historical and Antiquarian Studies (DHAS) in Assam, and the Assam Institute of Research for Tribals and Scheduled Caste (AIRTSC). Lastly, one librarian was selected from a public library, specifically the District Library in Kamrup (M), and shared a close ended questionnaire with aforementioned librarians.

4. Data Analysis and Interpretations

Data collected through questionnaire were analysed to identify the themes and patterns related to objectives of the study.
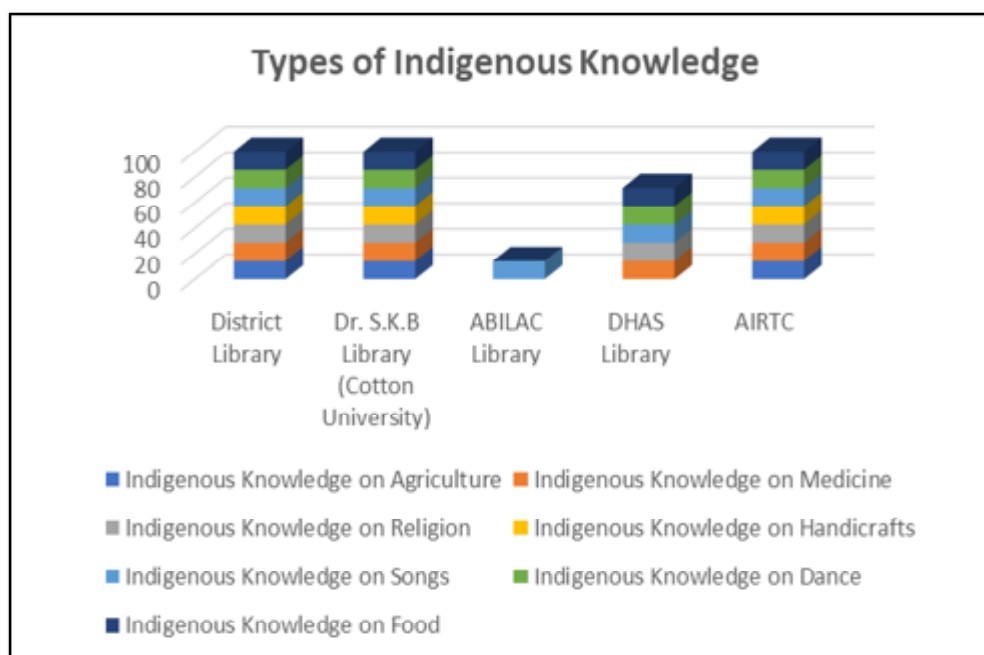
4.1 Types of Indigenous Knowledge

Table 1 shows that among the five (5) libraries observed, three (3) of them acquired all types of Indigenous knowledge documents, with the exceptions being the ABILAC and DHAS libraries. ABILAC Library acquired

resources on Indigenous knowledge on songs, while the DHAS library omitted the acquisition of Indigenous knowledge on agriculture and handicrafts.

Table 1: Types of Indigenous Knowledge are available in the library

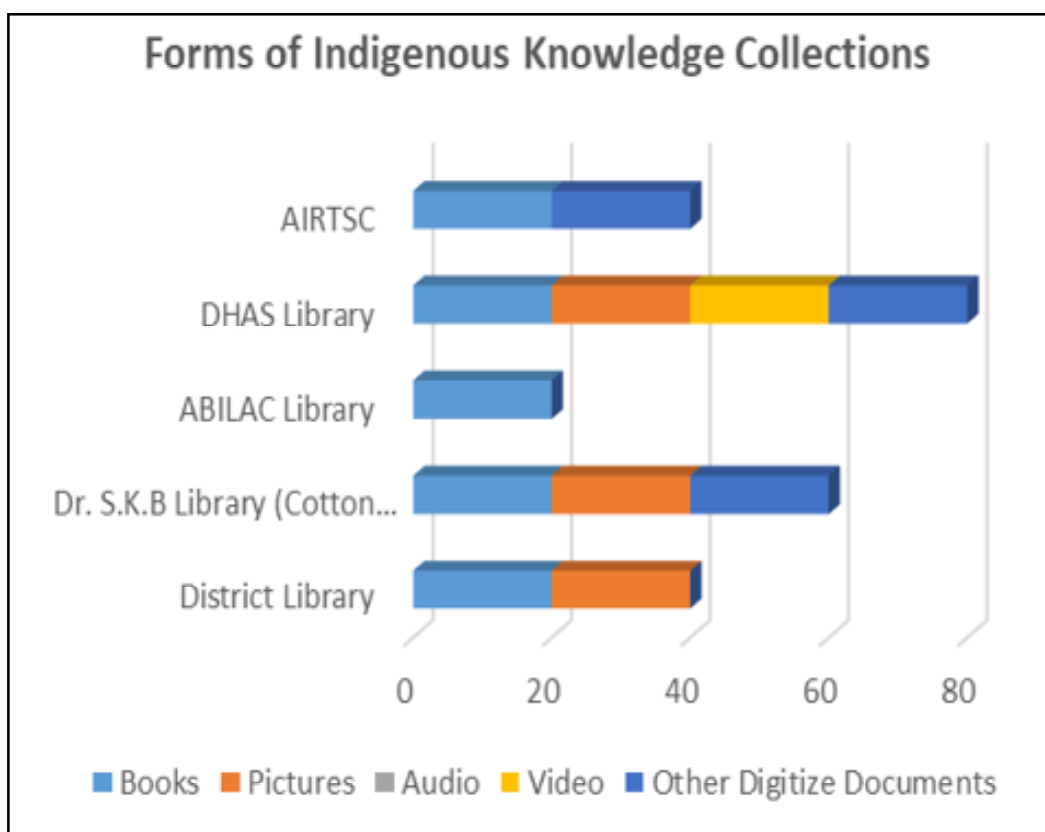| Types of Indigenous Knowledge	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Indigenous Knowledge on Agriculture	Yes	Yes	No	No	Yes
Indigenous Knowledge on Medicine	Yes	Yes	No	Yes	Yes
Indigenous Knowledge on Religion	Yes	Yes	No	Yes	Yes
Indigenous Knowledge on Handicrafts	Yes	Yes	No	No	Yes
Indigenous Knowledge on Songs	Yes	Yes	Yes	Yes	Yes
Indigenous Knowledge on Dance	Yes	Yes	No	Yes	Yes
Indigenous Knowledge on Food	Yes	Yes	No	Yes	Yes

Figure 3: Types of Indigenous Knowledge

4.2 Forms of Indigenous Knowledge Collections

Table 2 shows that all the libraries have indigenous knowledge collections in book form, but none have indigenous knowledge materials in audio form.

Table 2: Forms of Indigenous Knowledge Collections

Forms of Indigenous Knowledge	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Books	Yes	Yes	Yes	Yes	Yes
Pictures	Yes	Yes	No	Yes	No
Audio	No	No	No	No	No
Video	No	No	No	Yes	No
Other Digitize Documents	No	Yes	No	Yes	Yes

Figure 4: Forms of Indigenous Knowledge Collections

4.3 Familiarity of FAIR and CARE Principles

The data presented in Table 3 shows that all librarians of surveyed libraries are aware about the FAIR and CARE principles concerning the handling of Indigenous data.

Table 3: Familiarity of FAIR and CARE principles

FAIR&CARE	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
FAIR	Yes	Yes	Yes	Yes	Yes
CARE	Yes	Yes	Yes	Yes	Yes

4.4 Protocol/Guidelines for acquiring Indigenous Knowledge in the Library

Table 4 shows that District library, DHAS and Dr. S.K.B library, Cotton College library follow some specific protocol to acquiring indigenous library apart from the following libraries ABILAC and AIRTSC library didn't follow and protocol or guidelines.

Table 4: Protocol/Guidelines for acquiring Indigenous Knowledge in the library

	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Protocol/Guidelines for acquiring Indigenous Knowledge in the Library	Yes	Yes	No	Yes	No

4.5 Strategies for Integrating Indigenous Knowledge into Library Collections to Enhance Accessibility

Table 5 shows that all five libraries are incorporating cataloguing to enhance accessibility of indigenous knowledge; Dr. S.K.B Library (Cotton University) had done metadata tagging and indexing in their indigenous knowledge collection.

Table 5: Strategies for Integrating Indigenous Knowledge into Library Collections to Enhance Accessibility

|	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Metadata Tagging	No	Yes	No	No	No
Cataloguing	Yes	Yes	Yes	Yes	Yes
Indexing	No	Yes	No	Yes	Yes
OtherNo	No	No	No	Yes	

Figure 5: Strategies for Integrating Indigenous Knowledge into Library Collections to Enhance Accessibility

4.6 Strategies for Dissemination of Indigenous Knowledge in Library

Table 6 shows that, A total of four surveyed libraries except Dr. S.K.B Library (Cotton University) disseminate their indigenous knowledge through open access. Dr. S.K.B Library (Cotton University) and AIRTSC library provides digital access facilities. DHAS library promote their indigenous knowledge through citation practice. District library and Dr. S.K.B Library (Cotton University) organise community outreach programme to disseminate their indigenous knowledge collection.

Table 6: Strategies for Dissemination of Indigenous Knowledge in Library

	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Providing Open Access	Yes	No	Yes	Yes	Yes
Training on Data Reuse	No	No	No	Yes	No
Encouraging Citation Practices	No	No	No	No	No
Providing Digital Access	No	Yes	No	No	Yes
Translation Services	No	No	No	No	No
Community Outreach Programme	Yes	Yes	No	No	No
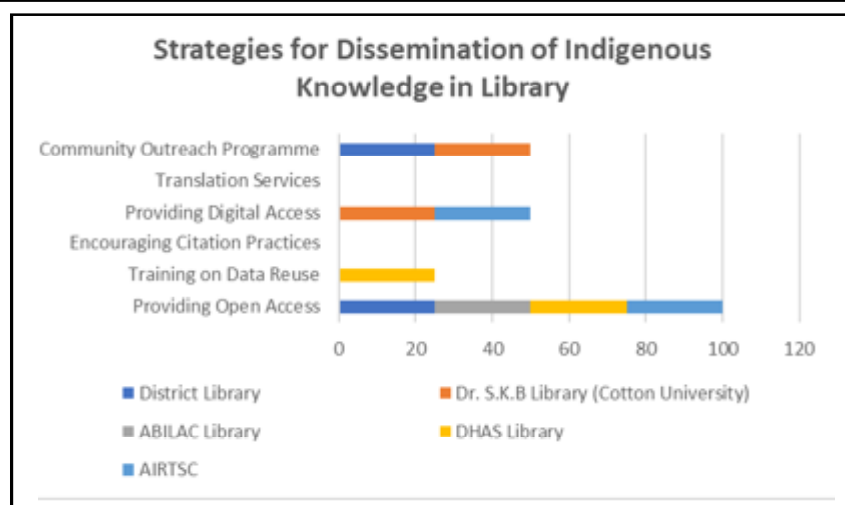
Figure 6: Strategies for Dissemination of Indigenous Knowledge in Library

4.7 Challenges in Acquiring Indigenous Knowledge

Table 7 shows that every library was facing different types of challenges in acquiring indigenous knowledge. DHAS and AIRTSC libraries faced challenges in acquiring Indigenous knowledge due to limited access by Indigenous communities and inadequate resources. ABILAC library and Dr. S. K. B. library (Cotton College University) have come across IPR challenges in acquiring Indigenous community knowledge. And DHAS Library, Dr. S. K. B. Library, and the district library are facing challenges with copyright issues.

Table 7: Challenges of Acquiring Indigenous Knowledge

	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Limited access of Indigenous community	Yes	No	No	Yes	Yes
Lack of funding	Yes	Yes	No	No	No
Lack of resources	No	No	No	Yes	Yes
Issues related to cultural sensitivity and trust	Yes	No	No	Yes	No
IPRNo	Yes	Yes	No	No	
Copyright	Yes	Yes	No	Yes	No

Figure 7: Challenges of Acquiring Indigenous Knowledge

4.8 Challenges of Preserving and Disseminating Indigenous Knowledge in the Library

Table 8 shows that Dr. S.K.B Library (Cotton University) and ABILAC Library are confronted with challenges regarding data security and privacy. The district library states concern over insufficient digital infrastructure, fear of misinterpretation or misuse by the stakeholder and Cultural resistance to digital technologies, all hindering the preservation and dissemination of indigenous knowledge. DHAS Library faces hurdles in research documentation and struggles with digitizing non-textual materials. AIRTSC Library comes across a language barrier as a challenge.

Table 8: Challenges of Preserving and Disseminating Indigenous Knowledge

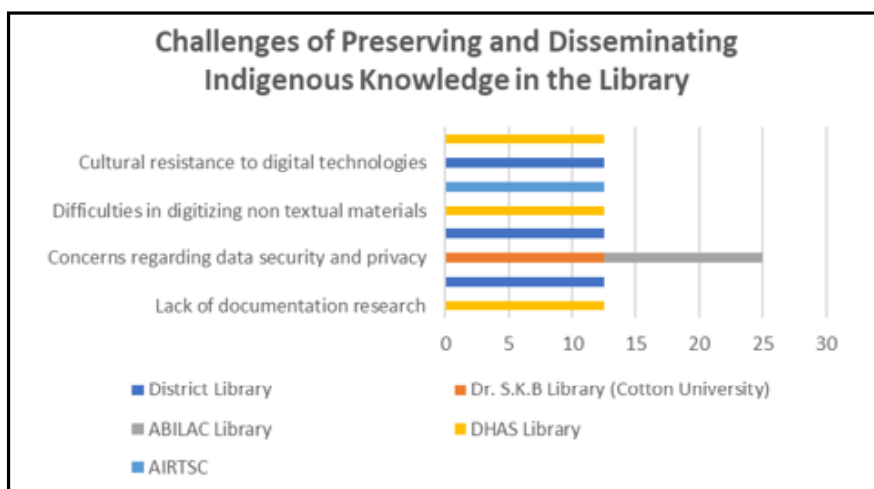|	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Lack of documentation research	No	No	No	Yes	No
Lack of digital infrastructure	Yes	No	No	No	No
Concerns regarding data security and privacy	No	Yes	Yes	No	No
Fear of Misinterpretation or Misuse by the stakeholders	Yes	No	No	No	No
Difficulties in digitizing non-textual materials	No	No	No	Yes	No
Language Barriers	No	No	No	No	Yes
Cultural resistance to digital technologies	Yes	No	No	No	No
Concerns about cultural misappropriation	No	No	No	Yes	No

Figure 8: Challenges of Preserving and Disseminating Indigenous Knowledge

4.9 Trained Staff on Cultural Sensitivity and Ethical Considerations

Table 9 indicates that out of five surveyed libraries, District library, Dr. S.K.B Library (Cotton University) and DHAS library have trained staff on cultural sensitivity and ethical considerations.

Table 9: Trained Staff on Cultural Sensitivity and Ethical Considerations

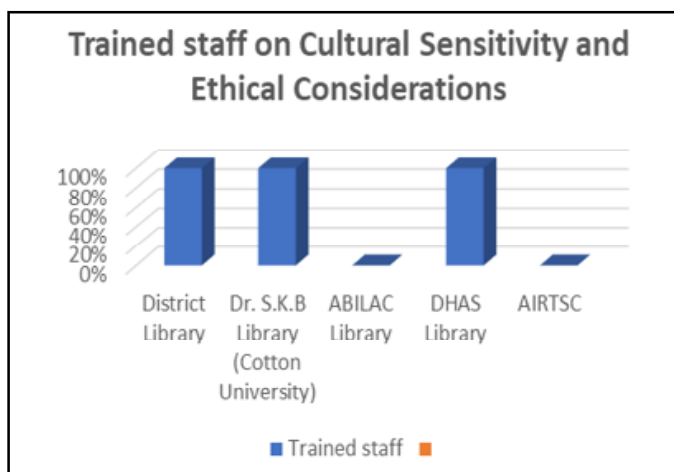|	District Library	Dr. S.K.B Library (Cotton University)	ABILAC Library	DHAS Library	AIRTSC
Trained Staff	Yes	Yes	No	Yes	No

Figure 9: Trained Staff on Cultural Sensitivity and Ethical Considerations

5. Findings and Discussion

The major findings of the study based on the data analysis and interpretations are mentioned below. These findings provide a comprehensive overview of how libraries are acquiring, preserving, and disseminating Indigenous knowledge, along with the challenges and strategies involved.

❖ **Types of Indigenous Knowledge Acquisition**: Three out of five libraries acquired all types of Indigenous knowledge documents. The ABILAC Library acquired resources on Indigenous knowledge related to songs, while the DHAS Library didn't acquire Indigenous knowledge on agriculture and handicrafts.

❖ **Forms of Indigenous Knowledge Collections:** All libraries had Indigenous knowledge collections in book form. None of the libraries had Indigenous knowledge materials in audio form.

❖ **Familiarity with FAIR and CARE principles:** All surveyed librarians were aware of the FAIR and CARE principles regarding Indigenous data handling.

❖ **Protocol/Guidelines for Acquiring Indigenous Knowledge:** Some libraries followed specific protocols for acquiring Indigenous knowledge, while others did not have clear guidelines or protocols.

❖ **Strategies for Integrating Indigenous Knowledge**: Cataloguing was a common strategy across all libraries, with metadata tagging and indexing being used in specific libraries like Dr. S.K.B Library (Cotton University).

❖ **Strategies for Dissemination of Indigenous Knowledge**: Surveyed libraries disseminated Indigenous knowledge through open access, digital access facilities, citation practices, and community outreach programs.

❖ **Challenges in Acquiring Indigenous Knowledge:** DHAS and AIRTSC libraries faced challenges in acquiring Indigenous knowledge due to limited access by Indigenous communities and inadequate resources. ABILAC library and Dr. S. K. B. library (Cotton College University) have come across IPR challenges in acquiring Indigenous community knowledge whereas, DHAS Library, Dr. S. K. B. Library, and the district Library are facing challenges with Copyright issues.

❖ **Challenges of Preserving and Disseminating Indigenous Knowledge:** Dr. S.K.B Library (Cotton University) and ABILAC Library are facing the challenges regarding data security and privacy. The district library states concern over insufficient digital infrastructure, fear of misinterpretation or misuse by the stakeholder and Cultural resistance to digital technologies. DHAS Library faces hurdles in research documentation and struggles with digitizing non-textual materials. AIRTSC Library comes across a language barrier as a challenge.

❖ **Trained Staff on Cultural Sensitivity and Ethical Considerations:** Some libraries had trained staff members on cultural sensitivity and ethical considerations, while others did not.

6. Limitation of the Study

This study gives emphasis only a few selected libraries of Assam so it's challenging to say if the findings apply to all libraries of Assam. It's important to do more studies to see how other libraries in Assam are acquiring, preserving and disseminating the Indigenous knowledge in today's digital world.

7. Conclusion and Recommendations

From above analysis, this study advocate for the development and implementation of specific protocols and guidelines for acquiring Indigenous knowledge to maintain ethical standards and respect Indigenous communities' rights and cultural sensitivities. The study suggests that libraries should prioritize metadata tagging, indexing, and other organizational strategies to improve the accessibility of their indigenous knowledge collections. To adopt open access policies, digital access facilities, community outreach programs, and citation practices to disseminate Indigenous knowledge effectively while respecting Indigenous intellectual property rights (IPR) and cultural values. The library should embrace open access policies, enhance digital access capabilities, initiate community outreach initiatives, and establish citation practices that effectively disseminate Indigenous knowledge while respecting intellectual property rights (IPR) and cultural values of the community.

In conclusion, the examination of FAIR and CARE principles in the acquisition, preservation, and dissemination of Indigenous knowledge in Assam's libraries reveals a significant step forward in aligning with ethical standards and ensuring equitable access and respectful treatment of diverse knowledge systems. These principles not only facilitate the preservation and accessibility of Indigenous knowledge but also empower Indigenous communities by giving them control and authority over their knowledge. Moving forward, continued efforts to integrate FAIR and CARE principles will contribute to the sustainable management and promotion of Indigenous knowledge within library settings, fostering a more inclusive and collaborative approach to knowledge sharing and preservation.

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