


Chapter 7

Preservation of Indigenous Knowledge in Open Science: Challenges and Opportunities

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ABSTRACT

In many areas, open science has created obstacles to indigenous knowledge. The peer-reviewed scholarly works published between 2000 and 2025 are reviewed in this chapter. The review's main conclusions demonstrated that intellectual property rights, knowledge appropriation, and loss of authority over indigenous knowledge are the main risks to indigenous knowledge. Documentation and preservation initiatives sponsored by the community may help overcome these issues. These tactics make use of online databases and tools.

INTRODUCTION

Historically, indigenous knowledge has been essential to communities' sustainable development. According to Ngulube (2023), a large number of academics, researchers, and researchers recognise the importance of IK in society and the necessity of preserving it, especially in fields related to natural resource management. Additionally, it has made it possible for communities to become resilient and adapt to changing environmental and climatic conditions, offered affordable means of obtaining and using locally available resources, empowered them to become

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self-sufficient and enabled them to contribute to the advancement of scientific knowledge worldwide, guaranteed food security, and made it easier to preserve cultural diversity. These days, the open science movement incorporates this process of worldwide scientific knowledge growth (UNESCO, 2021). By encouraging the sharing of research data, coding, and publication, the open science movement aims to remove obstacles to scientific knowledge and make research more transparent, accessible, and collaborative. The tenets of open science promote cooperation, openness, and the joint creation and administration of knowledge. This has led to the FAIR principles being fulfilled, and in many developing nations where IK has not been thoroughly documented, the open science movement has had a variety of effects on IK, including expanding opportunities for IK accessibility (Ngulube and Chigwada, 2023). This is clear from a number of research and projects that show how open science can increase IK's accessibility to a wider audience, fostering cross-cultural dialogue and understanding (Ngulube, 2023). Furthermore, the internet and digital technical advancements have made it possible to document and preserve IK digitally, assisting indigenous groups in preserving their languages, cultural legacy, and IK for future generations. This open scientific movement has also made it possible for researchers, institutions, and indigenous people to work together and further facilitate knowledge sharing and co-creation (UNESCO, 2021). As a result, indigenous groups now have the chance to preserve and enhance their indigenous knowledge systems by utilising global knowledge systems. This approach promotes increased involvement in research, makes it easier to build on previous findings, and eventually speeds up the scientific method. However, this has led to issues with intellectual property rights, cultural appropriation, and a lack of control. When information, stories, and cultural heritage are shared publicly without the appropriate procedures or protections, indigenous communities may lose control over them. Additionally, political oppression, colonial legacies, and occasionally competing social and political interests have made it difficult for indigenous communities to manage their IK. Fernandez-Llamazares et al. (2023) claim that attempts to incorporate IK into global knowledge systems have led to a significant loss of IK. Such losses cause poverty, eviction, and continuous cultural deterioration by upsetting the base of the people's cultures and means of subsistence. Threats to IK have also surfaced from corporate and governmental interests in several areas (Lay, 2020). Although there have been a number of studies on IK and open science, this chapter aims to expand on previous findings by outlining general dangers to IK, threats arising from the open scientific movement, and recommendations for how different IK preservation techniques could mitigate these vulnerabilities. The chapter also looks at how open science may support initiatives to improve the calibre of IK research without jeopardising the values of data science, IK, research quality, and data quality. Therefore, the purpose of this chapter is to examine the difficulties

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