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Protecting Africa's traditional knowledge: an approach to intellectual property governance and ARIPO's role

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The threat of misappropriation is one of the major challenges facing traditional knowledge in Africa today. This paper seeks to identify the challenges and potential opportunities for safeguarding this valuable heritage and will pay particular attention to the function of the African Regional Intellectual Property Organization and the recent Swakopmund Protocol. This research utilizes a documentary analysis to evaluate the protections afforded to traditional knowledge not only as a matter of justice but as a means of enhancing the socio-economic status of local communities. Based upon these results, the paper suggests establishing customized governance structures for the recognition and value of traditional knowledge so that local communities can realize tangible social and economic returns on their traditional knowledge and enhance their cultural identities. Finally, it is stressed that a persistent and collaborative effort by all stakeholders is required if traditional knowledge is to be preserved for future generations. The Swakopmund Protocol has been identified as an important model for regional intellectual property law and a comprehensive legal structure for the protection of traditional knowledge and traditional cultural expressions by ARIPO member states, which represents an important milestone in the establishment of community rights over their indigenous knowledge.

KEYWORDS

Africa, ARIPO, cultural heritage protection, Swakopmund Protocol, traditional knowledge

1 Introduction

Africa possesses a large body of inherited ancestral knowledge and an abundance of cultural legacy passed down via oral tradition and cultural practice (Obioha, 2010). It is essential to view this legacy not as isolated facts, but as a composite or pluralistic system comprising diverse domains with distinct characteristics. For instance, traditional ecological knowledge encompasses land management and biodiversity conservation, while traditional medical knowledge is represented by pharmacopeia and healing practices. Similarly, indigenous technical knowledge relates to artisanship and material manufacturing. Understanding these distinctions is fundamental to identifying the specific threats each area faces and determining the appropriate governing systems required for their protection.

This traditional knowledge (TK), accumulated over millennia of experience and interaction with the natural environment, holds immeasurable intrinsic value, extending beyond its practical utility in meeting basic needs to encompass deep cultural and spiritual significance. Despite its value, this heritage faces increasing threats from practices infringing on community rights and endanger the continent's cultural identity. Key threats include the

misappropriation of cultural expressions, biopiracy, and the persistent lack of recognition of local communities' rights over their own knowledge.

Consequently, the African Regional Intellectual Property Organization (ARIPO) has emerged as a key institution in promoting and protecting African TK. Since the 1990s, ARIPO has spearheaded efforts to establish a robust legal framework that acknowledges and safeguards the rights of local communities concerning their TK. A significant outcome of these efforts was the development and adoption of the Swakopmund Protocol, the first regional instrument of its kind globally, establishing a detailed legal framework for the protection of TK in its member states (Vargas-Chaves, 2025).

This paper will focus primarily on the major challenges and opportunities that exist within the protection of TK from Africa and what ARIPO as an organization can do to assist in these efforts and what the Swakopmund Protocol signifies in terms of a milestone toward this goal. Protecting TK from Africa is not just about creating social and cultural justice for the people of Africa but rather there are many opportunities for the sustainable socio-economic growth of the entire continent that can be created through the valuation and proper use of the TK that exists today (Santoro, 2023).

Protecting TK is based upon the value of TK itself as well as the role that TK plays in supporting the social and cultural development of communities. Africa contains an immense amount of biodiversity (United Nations Environment Programme, 2021) including more than 50,000 identified plant species and thousands of mammal and bird species (Ayisi, 1992; Idang, 2015) and these biological resources have evolved alongside the TK that has been developed by the indigenous peoples of Africa over the past several 1000 years (Ben-Amos, 1975). Many of the indigenous populations of Africa rely upon TK (Falola, 2003) and create numerous types of craft products such as basketry and ceramics (Fowler, 2008), as well as jewelry and clothing (Gerdes, 2007) that represent their own unique cultural identities (Whitfield, 2003; Wilson, 2002).

This paper will first examine the methodology employed for this documentary analysis. The paper then presents the results, exploring the diverse manifestations of TK in Africa, the ethical underpinnings of its communal nature, and the specific contributions and framework of the Swakopmund Protocol. The discussion will then interpret these findings, highlighting the ongoing challenges, such as biopiracy and cultural appropriation, and the efforts by ARIPO and other bodies to address them. Finally, the conclusion will summarize the critical need for sustained, collaborative action to preserve this invaluable African cultural legacy for present and future generations.

2 The symbiosis of biodiversity, culture, and ancestral knowledge in Africa

With respect to their natural surroundings, Africa's exceptionally high level of both biological and cultural richness is well-documented. There are currently more than 50,000 identified plant species on the continent (and there are at least 3,000 mammalian and avian species) (United Nations Environment Programme, 2021). It is important to note that this rich variety of flora, fauna and local technical knowledge developed by various African populations reflects an exceptionally long history of developing profound TK systems. Therefore, the

combination of this biodiversity and these TK systems form the basis for the livelihoods of many African populations (Ben-Amos, 1975; Ayisi, 1992; Idang, 2015).

Within the subset of Traditional Ecological Knowledge, African communities have developed sophisticated strategies for environmental adaptation that go beyond simple resource extraction. A prime example is found in the management of fragile ecosystems, where TK guides the restoration and maintenance of biodiversity. As noted by Uprety et al. (2012), this form of knowledge views humans and nature as part of a holistic worldview, creating a symbiotic relationship that supports ecological restoration. This deep understanding of ecosystem dynamics allows communities to sustain life in harsh conditions through proven conservation practices.

Examples of this unique relationship with the environment can be seen in the highly multifaceted agroforestry systems found in Northern African traditional oases. The oases represent an extremely effective method of adapting to very harsh arid environments, whereby TK related to water management and soil conservation develops highly complex ecosystems that allow for the development of biodiversity, provide food sources and enable the establishment of microclimates that are favorable to human existence (Santoro, 2023).

One of the key ways this TK is expressed is through the artisans of the various African communities who use their knowledge of flora and fauna to develop a broad range of products including but not limited to: basketry, ceramics, textiles and jewelry. For example, the Zulu people are well-known for their representational basketry and ceramics (Fowler, 2008), whereas the Mandara Mountains communities located between Nigeria and Cameroon have produced many examples of woven plant fiber products (Sterner, 2012).

Indigenous Technical Knowledge represents another critical subset, manifesting through the mastery of materials and manufacturing processes. This domain is not merely aesthetic but involves complex engineering and chemical knowledge passed down through generations. For instance, the production of woven plant fiber products in the Mandara Mountains (Sterner, 2012) or the specific firing techniques in Zulu ceramics (Fowler, 2008) demonstrate a high level of technical expertise. These practices transform raw biodiversity into utilitarian and cultural objects, representing a fusion of environmental knowledge and technical skill (Terry and Cunningham, 1993; 75 Highfield, 2017).

Similarly, biodiversity also provides the raw materials and techniques required to manufacture both utilitarian and decorative objects that reflect the cultural identity of the people creating them (Gerdes, 2007). For example, Ghanaian jewelry made from valuable metals, semi-precious stones, beads and other organic materials is a fundamental component of cultural expression and group identity (Wilson, 2002). An excellent example of the significance of TK in creating these types of objects is illustrated in the case of the Asante royal regalia stolen by the UK and returned to Ghana in 2024 (BBC, 2025). In addition to being considered highly valuable due to their aesthetic appeal, many of these adornments have a high degree of symbolic value and represent social status, tribal affiliation, religion and individual identity (Whitfield, 2003). The TK involved in manufacturing these ornaments include complex and diverse techniques that have been passed down through generations such as casting, hammering, setting and braiding (Kasfir, 1992).

The role of traditional medicine is a critical component of this body of knowledge, evident in the functions of Sangomas and

Inyangas in Southern Africa. While many Sangomas hold spiritual roles in healthcare—diagnosing physical and spiritual illnesses by communicating with ancestors—there is a distinct difference in the role of Inyangas. The latter are typically herbalists who utilize medicinal plants and animal products to treat physical ailments (King, 2012). Their extensive knowledge of local flora and fauna enables them to create custom preparations for each patient, making them indispensable in addressing basic needs such as food, medicine, and daily living essentials (Bishop, 2010).

Beyond Southern Africa, traditional medicine is a primary form of health care throughout much of Africa. For example, in West Africa, a substantial percentage of the population continues to rely on traditional herbal remedies to manage a wide variety of conditions due to both preferences based on culture and availability of natural remedies relative to conventional pharmaceuticals (D'Almeida et al., 2024).

This traditional ecological knowledge extends to sustainable resource management, where African communities have developed techniques such as selective breeding of livestock and crops to improve yields, thereby adapting to or shaping their ecosystems sustainably to preserve their cultural legacy. In more recent times, this rich heritage has intersected with modern science, leading to challenges regarding biotechnology and bioprospecting. Biodiversity has emerged as a potential income source, specifically using plant and animal genetic resources which has become a multi-billion-dollar industry (Ageh and Lall, 2019). In this context, Chen (2006) described the rise of biotechnology as a “green rush,” focused on bioprospecting for genetic resources with commercial value for pharmaceutical, biotechnological, and agricultural industries based on research and development.

This reality raises complex questions analyzed by authors like Msuya (2007) and Hountondji (2009). While biotechnology offers potential income, it necessitates establishing a minimum ethical and regulatory framework to ensure environmental and economic sustainability, apply precautionary measures to prevent genetic erosion, and respect the customs of local populations (Yankuzo, 2014). This includes obtaining informed consent from local peoples—who are the holders of TK related to genetic resources and guardians of biodiversity—and ensuring a fair and equitable distribution of economic benefits derived from their use, in agreement with communities and the state.

The examples cited represent a small fraction of the wealth and diversity of TK in Africa, which, born from observation, experimentation, and environmental adaptation, offers valuable solutions to social, environmental, and economic challenges on the continent.

3 Beyond individualism: community-centric approaches to knowledge and health in Africa

The African TK is an experiential knowledge system grounded in a relational world view and a very collectivist cultural background and includes a large emphasis on collective values, harmony and a shared commitment to ensuring the collective wellbeing of all (Owusu-Ansah and Mji, 2013; Mkabela, 2005). A prime example of how this ethos plays out in agriculture, is using rotational farming systems, developed by local communities in Tanzania. This form of farming reflects an

extensive comprehension of the need for ecological balance with its use of holes dug into sloping land, each hole has four ridges surrounding it, when rain falls the holes become natural reservoirs capturing water and preventing soil erosion while optimizing agricultural production.

Crop rotation maintains soil fertility, prevents pests and diseases, and promotes biodiversity (Kassie et al., 2013). This system highlights adaptive capacity, a commitment to sustainability, and the value of teamwork, prioritizing common interest over individual gain (Mkonda and He, 2017; Kassie et al., 2013; Fowler and Rockstrom, 2001).

This agricultural subset of TK is fundamental to food security and resilience against climate variability. By preserving indigenous crop varieties and soil management techniques, these knowledge systems offer tried-and-tested solutions that modern science is only recently beginning to validate. As highlighted by Kom and Nethengwe (2024), integrating these indigenous agricultural practices into current development initiatives is essential for achieving goals like Zero Hunger (SDG 2), proving that ancestral agricultural methods are adaptable tools for future sustainability. Likewise, the deep connection of local communities in countries like Nigeria, Ghana, and Senegal with arable land, the use of urea capsules represents another successful application of TK.

The methodology will provide an answer to the high cost and poor use of nitrogenous fertilizers via encapsulation technology, which compacts urea for slow and controlled release of nitrogen (Ifeoma et al., 2022; Cox et al., 2015). The encapsulated form of urea provides enhanced plant uptake of the nutrient and reduces loss of nitrogen through volatilization and leaching (Sadiq et al., 2022); thus providing lower production costs and less environmental degradation. The free sharing of the TK reflects the priority of community development over the individual appropriation of resources.

More recent studies also indicate that the indigenous agricultural systems of Africa are not simply relics of history but are important tools for achieving modern day international goals, such as SDG 2 (Zero Hunger). Through the incorporation of indigenous and local knowledge into current food security initiatives, African countries may develop and utilize climate-resilient crop varieties and sustainable farming practices that have survived numerous environmental disruptions for millennia and represent an opportunity to address malnutrition and increase agricultural resilience due to climate variability (Kom and Nethengwe, 2024).

In addition to its application in agriculture, the TK of Africa plays an integral part in the functioning of holistic health systems and the interconnection of communities, e.g., the traditional healers of Bushbuckridge, South Africa. These traditional healers perform an important function within the primary healthcare of the local population (Junod, 1962) and possess extensive knowledge of the medicinal properties of native flora passed down orally across generations to create herbal medicines for a variety of diseases (Mashele et al., 2021). Their approach to health care considers the physical, mental, and spiritual wellness of the patient and has been shown to be successful (Last and Chavunduka, 1986; Sibuye et al., 2012; Thornton, 2002).

Moreover, traditional African medicine is often a complementary system of healthcare whose inclusion with conventional healthcare may be the sole source of healthcare for marginalized populations (Thornton, 2009). The use of TK is based on a holistic approach that

includes social relational factors, representing a person's inner harmony; for example, research conducted by Durie (2004) with rural African women indicated that health included much more than just physical wellness, and was centered around being in a state of harmony with others in one's life. In many worldviews, illness occurs when there are breaks in emotional and social connections between individuals, indicating that health and wellness is not about the individual, but rather about the collective wellness and harmony of all community members (Owusu-Ansah and Mji, 2013).

Consequently, the subset of Traditional Medical Knowledge in Africa cannot be understood solely through a biological lens; it is intrinsically linked to a spiritual and social worldview. In this context, healing is a restorative process that addresses the 'social body' as much as the physical one. This holistic approach, where diagnosis involves communicating with ancestors and resolving social disharmony (Thornton, 2009), illustrates that African TK operates within a cosmivision where physical health is inseparable from spiritual and communal equilibrium.

Ultimately, community life and harmony are fundamental pillars in many African societies; according to African thought, a person achieves full humanity only through relationships with others (Sarpong, 2002). TK in Africa is, therefore, an invaluable human heritage based on interconnectedness and collective responsibility. Just as African society is fundamentally communal, so too is the acquisition and preservation of knowledge, requiring a multidisciplinary approach to promote intercultural dialog and joint research (Wynberg, 2023; Ageh and Lall, 2019; Chen, 2006).

4 ARIPO's landmark contribution: analyzing the Swakopmund Protocol's framework

The importance of protecting TK has been an important subject of debate in intellectual property policy circles since the WIPO began to lead that process (Robinson et al., 2017), largely because of the failure of traditional intellectual property systems to protect the kinds of knowledge generated by indigenous peoples and local communities (Blakeney, 2016). Traditional forms of intellectual property such as patents, copyrights and trademarks were created to provide protection for creators of individualized creative works in Western societies; TK, however, is often community-based, and passed down from generation to generation through the collective knowledge base of those communities. As a result of this lack of fit between traditional intellectual property systems and TK, there have been numerous international and regional efforts to create legal and regulatory frameworks to protect TK.

In this context, ARIPO's pioneering role is noteworthy. This regional organization has been instrumental in developing a regional legal framework for protecting these intangible elements of African cultural heritage (Van der Merwe, 2014; Rajasekharan et al., 2023). Specifically, in August 2000, ARIPO's Council of Ministers agreed on a "coordinated strategy" to adopt initiatives on TL and actively participate in WIPO's activities in this field. This marked the beginning of ARIPO's commitment to protecting TK.

It is important to acknowledge, however, that the intellectual property landscape in Africa is bifurcated primarily along linguistic and historical lines, resulting in two distinct regional organizations: ARIPO, predominantly serving Anglophone countries, and the

Organisation Africaine de la Propriété Intellectuelle (OAPI), which unites Francophone states. While both organizations aim to harmonize intellectual property rights, they operate under fundamentally different legal philosophies—ARIPO utilizing a flexible protocol-based system where member states can choose which instruments to adopt, and OAPI functioning under a unitary system where a single registration is valid across all member states (Andriantsiferana, 2012).

Afterwards, ARIPO's Administrative Council in Maputo, Mozambique adopted the Swakopmund Protocol in 2006, for the protection of TK and expressions of folklore. Subsequent endorsement by the Council of Ministers in 2007 in Lesotho allowed the Protocol to enter into force in 2015.

The significance of the Swakopmund Protocol is high; it was the first regional instrument globally to offer effective TK protection in the 2010s. It was also the first regional instrument globally to provide effective TK protection and cover a specific area of knowledge. In doing so, it created a unique legal framework for Africa to recognize TK and expressions of folklore as a single legally protected interest.

On August 9, 2010, the Protocol was approved; it was modified on December 6, 2016; and according to the information we have access to, it is currently signed by 17 of ARIPO's 22 Member States. It is worth noting that ARIPO membership is open to all member states of the Economic Commission for Africa and the African Union. The Protocol's relevance is based upon ARIPO's primary instrument to protect the rights of local and indigenous communities, to stimulate innovation and creativity and to promote the socio-cultural development of the continent (Chinsebu and Chinsebu, 2020).

Specifically, several key elements of the Swakopmund Protocol demonstrate its holistic nature. The preamble of the Protocol recognizes the inherent values of ancestral knowledge, traditional culture, and folklore, stating their social, cultural, spiritual, economic, intellectual, scientific, ecological, agricultural, medical, technological, commercial and educational value. Furthermore, the preamble acknowledges that TK systems serve as evolving systems of innovation, creativity and distinctive intellectual property that support both local and traditional communities and humanity at large.

In terms of definitions, the Swakopmund Protocol adopts a holistic approach, avoiding the limitation of TK to a single technical discipline. Instead, it encompasses agricultural, environmental, and medical knowledge, as well as knowledge related to genetic resources. The Protocol defines TK as knowledge developed through the intellectual efforts of a local or traditional community in a specific context, capable of being transmitted intergenerationally, whether through codification or oral tradition. Consequently, this definition covers a broad spectrum including practical knowledge, methods, innovations, and practices, provided they form part of a community's traditional lifestyle or codified knowledge systems.

One of the most important aspects of the Protocol is the lack of formality for obtaining protection for TK. Recognizing that transmission can occur orally, article 5 of the Protocol states that protection is not subject to formalities. As such, there are no specific requirements that must be met to receive protection, and thus registration with a national or regional organization is not necessary.

Lastly, regarding the duration of protection, this is not clearly defined within the Protocol. One possible interpretation of article 13 indicates that TK would be protected for as long as it meets the protection criteria outlined in other articles of the Protocol. However, there is an exception to this rule, in that TK that is exclusive to an

individual (as opposed to a collective) would be protected for 25 years after the knowledge is used outside of its traditional context.

5 The contemporary landscape of TK protection

Oral tradition and cultural practices passed down through generations in Africa are the source of a large body of knowledge that supports the daily lives of Africans. For example, this knowledge supports basic needs such as finding food, using medicinal plants and making various types of crafts. The TK related to biodiversity in Africa is also rich culturally and spiritually; plants and animals are seen as not just resource material but as components of a holistic worldview that includes humans with nature (Uprety et al., 2012).

This TK continues to be vulnerable to many threats. Bioprospecting, defined as searching for biological resources or traditional uses for commercial purposes, occurs increasingly without the informed consent or active involvement of local communities (Vargas-Chaves et al., 2018). Additionally, there is growing concern about the lack of authorization for the use of African TK in the reproduction of artisanal expression of other markets; this TK represents a valuable cultural heritage that must be preserved and transferred (Dountio, 2011).

As the world moves into the digital age, the preservation and transfer of this knowledge encounter new dynamics driven by Information and Communications Technology (ICTs). While digitization offers a means to preserve and share ancestral knowledge across generations, it simultaneously presents challenges regarding data sovereignty and digital misappropriation. This duality necessitates careful governance of technology to ensure it serves as a bridge for cultural continuity rather than a mechanism for exploiting cultural heritage (Mulaj, 2024).

This challenge extends to the fashion industry, which has a continuous need for innovation and novelty and relies heavily upon the imitation of other cultures for inspiration. Although the appropriation of stylistic elements from other cultures is nothing new; for example, European fashion has long been influenced by the styles of the East and in the 1990s, there was increased interest in showing designs based on traditional, ethnic, and folklore themes (Vargas-Chaves et al., 2021), thus indigenous patterns and motifs have become inspirational sources for “ethnic” designs (Vezina, 2019; González Tostado, 2020). As a result of this trend, African culture has been subject to appropriation, frequently through the lens of a Eurocentric view that frames it as exotic and foreign to Western culture (Marrero Severino, 2019). The view of African culture that emerges from this distortion is reduced to stereotypical simplification, and in doing so, the richness and complexity of African cultural expressions are lost, resulting in the reduction of physical or cultural traits to “amazing” and the misuse of symbols, hairstyles, music, etc.

To address these challenges, both international and regional initiatives have been implemented. WIPO has taken on a critical role in supporting the protection of genetic resources and TK, and the current negotiations for a legal instrument that can provide a basis for an international legal framework represents a major step forward (Robinson et al., 2017). However, the negotiations within WIPO’s Intergovernmental Committee on Intellectual Property and Genetic Resources, TK and Folklore have been difficult and

challenging, while providing an opportunity for establishing an international legal framework that recognizes and protects the rights of indigenous and local communities over their ancestral knowledge; ultimately, the success of these negotiations will depend on the willingness of states to act and the active participation of all relevant stakeholders, particularly in identifying the extent of protection provided by the legal instrument and defining the actions that would constitute violations of TK.

The ARIPO Swakopmund Protocol provides an important milestone for the African region in that it establishes a wide-ranging legal framework for the protection of TK within the African region (Van der Merwe, 2014). The Swakopmund Protocol allows member States to protect their TK from biopiracy, cultural piracy and misappropriation of TK while providing additional support for the preservation of cultural identities and enhancing social cohesion among member States (Nyakotoy, 2013).

However, one major limitation of the ARIPO Swakopmund Protocol is that it does not provide adequate coverage for the protection of Genetic Resources (GR) associated with TK. This omission in the Swakopmund Protocol leaves a void in terms of GR because they constitute the very basis of communities’ cultural and biocultural heritage (Blakeney, 2016), and therefore their protection extends far beyond intellectual property rights, as defined by the Convention on Biodiversity (CBD). GR is vital for human health, food security, agriculture, medicine and ecosystems, and thus sustainable use of these resources is necessary for sustainable development.

ARIPO is currently working on developing a regional legal framework for the protection of GR associated with TK. However, the process has been slow due to the complexities of the relationship between the TRIPS Agreement and CBD obligations, and the issue of benefit sharing disparities between companies using these GR and traditional communities owning these GR.

Unlike ARIPO’s sui generis protocol, the OAPI regime is based upon the Bangui Agreement, a common intellectual property code for the 17 member States of OAPI. In the past, the OAPI system has placed great emphasis upon alignment with international standards of industrial property, including patents and trademarks, to promote trade and foreign investment. The unitary character of the OAPI legal framework facilitates a simplified legal environment for commercial rights but has historically received criticism for the lack of progress in developing sui generis frameworks that are specifically designed to accommodate the communal nature of TK compared to the advancements made by the Swakopmund Protocol.

This focus on industrial compliance is clearly illustrated in the regulation of agricultural innovation (Humphries et al., 2023). Critical examinations of the legal evolution of the region, concerning the revised Bangui agreement and plant variety protection in OAPI member countries, suggest that the adoption of strict plant breeders’ rights models based on the UPOV convention may lead to the marginalization of small-scale farmers (Zoundjehkpon, 2013). Commercial seed varieties are often prioritized in these regimes at the expense of the traditional agricultural practices and seed exchange systems that represent the foundation of food security and biodiversity in West and Central Africa, thereby illustrating a dichotomy between formal IP protection and the safeguarding of community-based TK.

Further, the geographical scope of these regional harmonization initiatives is significantly limited by the status of Africa’s largest

economies—Nigeria and South Africa—which are not full members of ARIPO but act as observers. Unlike full membership, observer status does not automatically bind these nations to the organization's instruments. Therefore, it cannot be assumed that the protective measures provided for in the Swakopmund Protocol apply to these jurisdictions. Instead, Nigeria and South Africa rely on their respective autonomous national legislations, resulting in a regulatory patchwork where large segments of the African continent's TK remain outside the unified jurisdiction of regional bodies (Vargas-Chaves, 2025; Zoundjiekpon, 2013).

A further challenge for ARIPO and African governments is the extension of the provisions contained in the Swakopmund Protocol into other regional or national instruments. For example, the Organization Africaine de la Propriété Intellectuelle (OAPI), established in Yaoundé with 16 Francophone Central and West African Member Countries, has been replicating ARIPO's model since the early 2000s (Adewopo, 2003). Furthermore, both ARIPO and OAPI are active participants in the international standard setting processes for the protection of TK and folklore, primarily through the WIPO intergovernmental committee (Alves and Pereira Cabral, 2018), where these two institutions have represented African countries' interests and ensured that international norms reflect the realities and needs of the continent.

Ultimately, the successful implementation of the Swakopmund Protocol can serve as an invaluable vehicle to encourage sustainable socio-economic development and preserve the rich cultural heritage of Africa. To effectively safeguard TK, however, there must be a joint, concerted effort from multiple stakeholders, including ARIPO member States, local and traditional communities, the private sector, academia, and civil society. It is necessary to adopt a multi-stakeholder, participative approach involving all these stakeholders to ensure that TK is protected in Africa and generate socio-economic benefits for communities and strengthen cultural identity and social cohesion.

6 Discussion

This documentary analysis has provided substantial data about the dual nature of TK in Africa as a significant socioeconomic resource and an asset vulnerable to loss. The review of literature in this area consistently shows that TK systems, comprising many different forms of TK, including environmental management, medicinal practices and artisanal techniques, form the foundation upon which communities survive and maintain their cultural identities throughout Africa. Although, the documentation also quantifies a deficiency in the protective frameworks for TK, with numerous documented instances of misappropriation by external parties of both genetic resources and traditional cultural expressions in the context of Africa, indicating the failure of conventional intellectual property frameworks to prevent the unremunerative exploitation of the former, and the unremunerative appropriation of the latter.

In terms of the institutional framework for the protection of TK in Africa, the documentary analysis of the ARIPO legislative effort culminates in the establishment of the Swakopmund Protocol as a regulatory instrument to fill the identified gap in protecting TK in Africa. The documentary analysis of the Swakopmund Protocol, identifies several legal innovations that distinguish this instrument from other IP models, most notably the removal of formalities for registering TK and the recognition of trans-generational community ownership of TK. The regulatory outcomes from the documentary analysis of the

Swakopmund Protocol provide a clear indication of the legal parameters that will enable member states to utilize this instrument to protect TK in Africa, thus providing the required empirical evidence to assess the impact of these regional governance initiatives.

The results from the documentary analysis demonstrate the critical importance of TK in Africa, the multiplicity of threats to which TK is exposed and the evolving role of ARIPO, as an organization, in attempting to establish legal protection for TK in Africa, as demonstrated by the Swakopmund Protocol. This section discusses the results from the documentary analysis, sets the findings in the context of the extant literature (as referenced in the source document), defines the contribution of this study and recognizes the limitations of the study and implications arising therefrom.

The results from this research confirm that TK in Africa is not a static relic of the past, but rather a living and active body of knowledge, essential to the preservation of the cultural identity, spiritual wellbeing and sustainable livelihood of local communities. The views of Obioha (2010) and Idang (2015) regarding Africa's rich cultural heritage and the relational cosmivision underlying TK systems support this view. The examples of sophisticated agricultural practices, such as Tanzanian rotational farming (Kassie et al., 2013; Mkonda and He, 2017), and the holistic nature of traditional medicine (Thornton, 2009; King, 2012), illustrate the practical and ethical dimensions of TK in Africa, and the fact that the knowledge, often prioritizes communal welfare and ecological balance over individual benefit.

TK can be analyzed through its various subsets, demonstrating that legal instruments often fail to treat each subset with equal consideration. Traditional artisanal expressions, which are tangible representations of indigenous TK, may receive some limited protection under copyright-related laws governing folklore, while the protection afforded to TK related to ecology and traditional medicine is much less certain. These latter two subsets of TK are often inextricably linked to genetic resources and biological processes, and therefore are extremely vulnerable to biopiracy, in contrast to purely aesthetic expressions. Therefore, the failure to differentiate between these subsets in broader policy discussions often masks the urgent need to develop sui generis regimes that address the misappropriation of intangible innovations in agriculture and medicine.

One of the key findings of the documentary analysis is the persistent threat of misappropriation, including biopiracy and the commercial use of TK. The concerns expressed by Ageh and Lall (2019) concerning biopiracy of plant resources, and Vargas-Chaves et al. (2018), concerning the need for prior informed consent, highlight the ongoing concerns around the misappropriation of TK. Additionally, the example of the fashion industry's appropriation of African cultural elements, as discussed by Marrero Severino (2019) and Vezina (2019), illustrates the challenges of TK in a globalized economy where cultural motifs can be removed from their original context and meaning and used commercially, without equitable benefit-sharing.

As the first regional instrument of its type, the Swakopmund Protocol represents a significant advancement in the protection of TK in Africa. It offers a unique legal framework that seeks to address the shortcomings of conventional IP systems, as noted by Blakeney (2016), in protecting collectively held, trans-generational knowledge. The provision of the Protocol, including the broad definition of TK, the absence of formalities for protection, and its focus on community rights, reflect a sophisticated understanding of TK systems.

This study has highlighted both opportunities and challenges to Protocol. Currently, the Protocol's framework does not include

adequate protection for genetic resources related to TK; this is a critical issue since these two concepts are very closely interrelated and without adequate protection for genetic resources, it will be difficult for countries to ensure that they achieve equitable and fair benefit sharing, which is one of the goals of the Convention on Biological Diversity (CBD). Therefore, the efforts of ARIPO to create a separate framework for the protection of genetic resources are essential. However, the complexity of reconciling different international legal frameworks, such as the TRIPS Agreement and the CBD, and resolving the issues of unequal benefit sharing, make the task even more challenging.

The main contribution of the study lies in the fact that it is the first study to provide a thorough overview of the state of TK protection in Africa, including the role of ARIPO and the Swakopmund Protocol, through a thorough documentary analysis. It emphasizes the close relationship between TK protection, cultural identity, social justice, and sustainable development. In addition, the study found that many African TK systems have traditionally prioritized the wellbeing of their respective communities, providing new insights into contemporary debates about sustainable development and ethically developed innovations.

There is, however, a possible limitation inherent in a documentary analysis, i.e., the reliance on previously available information. On the grounds, practices and perspectives of local communities may not be completely captured in documentary analyses. Further, although the source material used was considerable, international negotiations and national legislative developments are constantly changing, and thus the context within which the study took place is evolving.

As a practical contribution, the study underlines the need for ARIPO Member States to fully implement and enforce the Swakopmund Protocol and for ARIPO to speed up the process of developing a framework for the protection of genetic resources. The study also provides evidence of the need for increased capacity building in both national and local contexts to enable communities to effectively exercise their rights. As a theoretical contribution, the study provides additional insight into the larger discussion on *sui generis* systems of intellectual property law protection and the challenges of decolonizing IP law to better accommodate knowledge systems outside of the Western world.

Some of the areas for future research include assessing the effectiveness of the Swakopmund Protocol in selected ARIPO member states, conducting case studies on successful benefit-sharing mechanisms, exploring further the relationships between TK, genetic resources, and international legal frameworks. Research into the involvement of ARIPO and OAPI in international organizations, such as WIPO's IGC, and tracking/analyzing their actions would also be beneficial. Overall, as the source text concluded, the long-term preservation of Africa's TK will require a continued collaborative effort among all relevant stakeholders to protect this valuable cultural heritage for future generations.

6.1 Methodological implications

Using a qualitative documentary analysis methodology to explore the difficulties and opportunities surrounding TK protection in Africa with a focus on ARIPO and the Swakopmund Protocol, this research uses a structured and systematic multi-stage research design to critically evaluate existing literature and legal instruments. To begin the process of data collection, relevant documents were collected and

collected from online specialized databases; for a complete picture of the current academic and legal environment a number of prominent academic databases, such as Scopus and Web of Science, along with legal databases pertaining to intellectual property, were searched. Using an array of keywords in both English and Spanish—such as ‘traditional AND knowledge AND Africa,’ ‘traditional AND cultural AND expressions,’ and ‘intellectual AND property’—where the Boolean operator ‘AND’ was specifically applied to narrow down search parameters and to insure that all search results were strictly relevant to the objectives of this research, the search strategy allowed for the retrieval of a high volume of relevant documents.

In addition to utilizing digital analytical tools to assure methodological rigor in the processing and analysis of the collected data set, specific tools were incorporated into the workflow. Specifically, the legal analytical tool Vincent by vLex, was used to parameterize the legal results of this research, which provided the means to determine the existence of cross-jurisdictional relationships and to classify statutory provisions within the African context. Simultaneously, NVivo 14 software was used for the thematic coding of secondary sources, which provided the ability to systematically organize and categorize qualitative data into discrete and categorized nodes—such as ‘biopiracy,’ ‘*sui generis* frameworks,’ and ‘benefit-sharing’—and thus enable the effective management of very large volumes of textual data. Through its application the use of these tools enabled the development of a structured workflow of screening, categorization, and critical analysis, and thereby assured the validity of the interpretation by employing a specific data triangulation strategy.

The data triangulation strategy involved cross-checking information from three different categories of sources: primary legal texts (Swakopmund Protocol and national laws); institutional policy reports (ARIPO and WIPO documents); and secondary academic literature. Through the comparison of the normative aspirations articulated in legal texts to the empirical criticisms presented in academic literature the study was able to demonstrate and validate the gap between theoretical legal frameworks and the practical implementation of TK protection. Ultimately, the study synthesized these triangulated insights to provide an argument for why it is important to protect African TK, providing a foundation for the findings discussed in this paper, and further insuring that the arguments for social justice, socioeconomic development, and cultural identity presented in this research are based upon a solid, verifiable evidence base.

6.2 Concluding remarks

This documentary analysis has fully explored many aspects of the critical issues affecting the protection of TK in Africa, and how both the ARIPO and the innovative Swakopmund Protocol have contributed to that effort. The research confirmed that there exists a large and ever-changing storehouse of indigenous knowledge throughout Africa that is deeply tied into the cultural identity, spirituality, and sustainable livelihoods of many local communities. That knowledge encompasses areas of medicine, agriculture, artisanal crafts, and other subjects, and represents a significant amount of intrinsic and practical value.

The primary goal of this document was to explore both the obstacles and opportunities in protecting that legacy. The research clearly indicates that the wealth of African TK is at risk, especially from theft or appropriation, biopiracy, and commercial exploitation

of traditional cultural expressions, and that those risks are increased due to globalization and the failure of national governments to recognize the rights of communities.

Regarding the way in which this study's findings should be interpreted, it is important to acknowledge that the methodology employed by this study integrates the results into their discussion. In contrast to the methodologies used in empirical research to generate quantitative data, the 'findings' of this study refer to the thematic synthesis of legal frameworks and case studies, which were analyzed simultaneously to provide a contextually relevant interpretation. The methodology employed by this study illustrates that the problem with TK protection is not simply a lack of legislation, but rather a fundamental disconnection between the rigid, static nature of Western-style intellectual property regimes, and the dynamic evolution of TK systems.

The discussion of the findings provided in this study addresses that disconnection, providing a bridge between the study's findings and the global dialog on the subject. The study shows that, although African instruments such as the Swakopmund Protocol are regionally specific models of the "defensive protection" of heritage, they also demonstrate a universal model that can be replicated to protect heritage worldwide. Through the synthesis of the documentary evidence of misappropriation and the legal countermeasures employed by ARIPO to respond to that misappropriation, the study provides evidence of the significance of regional efforts toward decolonizing intellectual property law, which aligns with the increasing global demand for equitable knowledge governance.

The work of ARIPO and the Swakopmund Protocol are major steps forward in addressing the challenges facing the protection of TK in Africa. The Swakopmund Protocol is the first regional instrument in the world to provide a comprehensive framework for the protection of TK and expressions of folklore, acknowledging the collective nature of TK and making attempts to establish rights for local communities. The Swakopmund Protocol's provisions for TK protection include protection of TK without formality, and a broad scope of protection.

Protecting African TK will continue to be a difficult and ongoing process. The Swakopmund Protocol has limitations, including the lack of full coverage of genetic resources related to TK, an area that ARIPO continues to develop. For the Swakopmund Protocol to be implemented successfully, and for the broader protection of TK to be achieved, a sustained, multi-faceted and cooperative approach will need to be taken. Strengthening institutional capacity, ensuring that local communities remain actively engaged in the process, and encouraging cooperation among states, the private sector, academia and civil society will all contribute to the protection of TK in Africa. It will be very important for the regional and international efforts led by ARIPO, and supported by organizations such as OAPI, to advance the agenda of TK protection that is responsive to the realities and needs of African communities.

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To summarize, the protection of TK of Africans is not simply about preserving a cultural legacy; it is about achieving social justice, creating opportunities for sustainable socioeconomic growth, and empowering local communities while enabling them to maintain their cultural identities. Continued support from all stakeholders will be required to ensure that this valuable legacy is protected and passed down to future generations to create a more equitable and culturally richer world.

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IV-C: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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