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Original Article

**Ethnopharmacological evaluation of the African potato (*Hypoxis hemerocallidea*):
A community-based cross-sectional study on its role in promoting good health and well-being in KwaZulu-Natal, South Africa.**

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Abstract

Background:

The African Potato (*Hypoxis hemerocallidea*), a medicinal plant deeply rooted in African Indigenous Knowledge Systems (AIKS), has long been used by traditional healers for immune support, chronic illnesses, and infection management. However, limited empirical evidence exists to validate its therapeutic benefits within modern scientific frameworks. This study explores traditional uses, community knowledge, and perceived health outcomes associated with African Potato among residents of KwaZulu-Natal.

Methods:

A cross-sectional mixed-methods design was employed, involving 150 participants selected through purposive and snowball sampling in rural and peri-urban communities. Quantitative data were collected through structured questionnaires on usage frequency, health purpose, and perceived outcomes, while qualitative insights were obtained from semi-structured interviews with traditional healers, herbalists, and community elders. Descriptive statistics and thematic analysis were used to interpret the data.

Results:

Participants ranged from 21 to 74 years old, with the majority being female (62%) and unemployed or self-employed in informal trade. Over 80% reported using African Potato as part of household health remedies, primarily for managing symptoms of HIV/AIDS, diabetes, arthritis, and infections. Traditional practitioners emphasized its immune-boosting, spiritual, and cleansing properties. Community knowledge strongly aligned with the plant's recognized anti-inflammatory and antioxidant functions. Despite widespread reliance and positive perceptions, participants noted inconsistent dosage, lack of standardized preparation, and uncertainty regarding contraindications, highlighting a gap between traditional practice and scientific validation.

Conclusion:

African Potato remains a cornerstone of Indigenous healing in KwaZulu-Natal, supported by lived experiences and communal trust. While its ethnomedicinal value is widely acknowledged, further scientific research is needed to validate therapeutic claims and ensure safe integration into primary healthcare systems.

Recommendations:

Interdisciplinary research between scientists and traditional healers is essential to document preparation methods, determine safe dosage, and enhance the credibility of Indigenous knowledge for formal health applications.

Keywords: African Potato, Indigenous knowledge, Traditional medicine, Interdisciplinary research, Traditional healers, Biomedical integration, Community-driven conservation, Sustainable use

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Background

The African Potato (*Hypoxis hemerocallidea*) is a perennial herb indigenous to southern Africa, long valued in African Indigenous Knowledge Systems (AIKS) for its medicinal and spiritual properties. Traditionally referred

to as *inkomfe* in isiZulu, this plant is widely used by traditional healers and rural communities to manage a variety of ailments, including HIV-related immune deficiencies, diabetes, arthritis, infections, and certain cancers. Its underground corm is known to contain



biologically active compounds such as sterols and sterolins, which have been associated with immune-modulating, anti-inflammatory, and antioxidant effects. Despite its popularity and deep cultural roots, there remains a critical gap in scientific literature validating the therapeutic claims of *Hypoxis hemerocallidea*. Most of the existing knowledge remains anecdotal, passed down orally through generations, and is seldom documented or analyzed through empirical research. Additionally, the lack of standardized dosages, potential herb-drug interactions (especially among HIV-positive individuals on antiretroviral therapy), and ecological pressures from overharvesting underscore the need for more formal investigation. With growing global interest in integrating traditional and modern medicine, the African Potato presents an important case for examining how Indigenous knowledge can contribute to sustainable healthcare solutions. This study is framed under the broader theme of "Harnessing African Indigenous Knowledge for Good Health and Well-being", aligned with global health equity and sustainable development goals.

Research Objectives

- I. To explore the ethnomedicinal uses of the African Potato among rural and peri-urban communities in KwaZulu-Natal.
- II. To document community perceptions of the plant's effectiveness in managing specific health conditions.
- III. To identify methods of preparation, frequency of use, and accessibility patterns among different demographic groups.
- IV. To compare traditional beliefs and practices with existing scientific literature on the pharmacological properties of *Hypoxis hemerocallidea*.
- V. To assess potential opportunities and challenges for integrating the African Potato into formal healthcare systems.

Methodology

Study Design

This study adopted a cross-sectional mixed-methods design, integrating both quantitative and qualitative research approaches to explore the ethnopharmacological use of the African Potato (*Hypoxis hemerocallidea*). The combination of structured surveys and in-depth interviews allowed for a comprehensive understanding of usage patterns, cultural perceptions, and community-level practices.

Study Setting

The research was conducted in selected rural and peri-urban communities across KwaZulu-Natal, South Africa, between January and April 2025. These communities were chosen for their active use of traditional medicine and accessibility to local knowledge holders such as traditional healers and herbalists.

Participants

The study included a total of 150 participants, comprising adults aged 18 years and older who had experience using or knowledge of the African Potato. Of these, 120 participants completed structured quantitative questionnaires, while 30 participants (including traditional healers, herbalists, and community elders) took part in qualitative semi-structured interviews. Participants were recruited through purposive and snowball sampling. Traditional healers, community elders, and herbalists were intentionally selected for their expertise, whereas general community members were referred by initial informants. Inclusion criteria required participants to (1) be residents of the study area, (2) have prior experience with African Potato or knowledge of its medicinal application, and (3) provide informed consent. Individuals who had never used traditional medicine were excluded from participation.

Bias

To minimize potential bias, the research team included multilingual fieldworkers who were culturally competent and familiar with the communities. Interviews were conducted in the preferred language of each participant (isiZulu or English), and confidentiality was ensured to encourage honest responses. Triangulation of qualitative and quantitative data was employed to strengthen the validity of findings. Efforts were also made to include a diverse range of age groups and genders to reduce sampling bias.

Study Size

The target sample size of 150 participants was determined based on the exploratory nature of the study and feasibility within the study timeframe. This number was considered sufficient to provide meaningful insights for both statistical analysis and thematic depth in qualitative data.

Statistical Analysis

Quantitative data collected from structured questionnaires were analysed using descriptive statistics (frequencies, percentages, and means) with the aid of Microsoft Excel and SPSS (version 25). Qualitative data from interviews

were transcribed and analysed using thematic content analysis, allowing for the identification of key patterns, beliefs, and narratives. Missing data in the quantitative component were addressed through case-wise deletion where appropriate, ensuring only fully completed responses were included in the analysis.

Ethical Consideration

The study was approved by the Mangosuthu University of Technology Research Ethics Committee on 11 February 2023. All participants provided written informed consent, and the study adhered to ethical principles of voluntary participation, confidentiality, and cultural respect.

Results

Table 1: Themes, Codes, and Illustrative Meanings

Theme	Codes	Description / Meaning
1. Immune-Boosting and Strengthening	“body becomes strong”, “fights sickness”, “boosts blood”, “cleansing”	Participants believed African Potato strengthens immunity, prevents recurring illness, and protects the body from infections.
2. Management of Chronic Illnesses	“for sugar (diabetes)”, “arthritis pain”, “HIV treatment support”, “pressure (hypertension)”	Used as supplementary therapy for chronic conditions to reduce symptoms such as pain, fatigue, or inflammation.
3. Spiritual and Ancestral Healing	“cleansing from bad luck”, “traditional protection”, “used in rituals”, “spiritual strength”	The plant is used alongside prayer and rituals for ancestral protection and emotional restoration.
4. Accessibility and Affordability	“easy to find”, “cheap”, “we grow it at home”, “sold by herbalists”	Participants emphasised cost-effectiveness and availability compared to clinic medicine.
5. Knowledge Passed Through Generations	“my grandmother taught me”, “learned from elders”, “community knowledge”	Use of the African Potato is driven by indigenous knowledge transferred through family and local healers.
6. Lack of Standard Dosage and Safety Concerns	“don’t know correct dose”, “sometimes too strong”, “not sure for pregnant women”, “mixing with pills”	Participants acknowledged uncertainty about dosage, contraindications, and mixing with prescribed medication.

A total of 180 individuals were approached for the quantitative survey. Of these, 165 were examined for eligibility. Fifteen individuals were excluded because they had never used African Potato or lacked knowledge of traditional remedies. Therefore, 150 participants met the eligibility criteria and were enrolled in the study. Of the 150 enrolled, 135 completed the full questionnaire, while 15 questionnaires were incomplete due to early withdrawal, time constraints, or poor literacy levels.

Finally, 120 fully completed responses were included in the statistical analysis after case-wise deletion of incomplete data.

Reasons for non-participation:

- Never used traditional medicine (n = 15)
- Incomplete questionnaire (n = 15)
- Withdrawal/lack of time (n = 5)

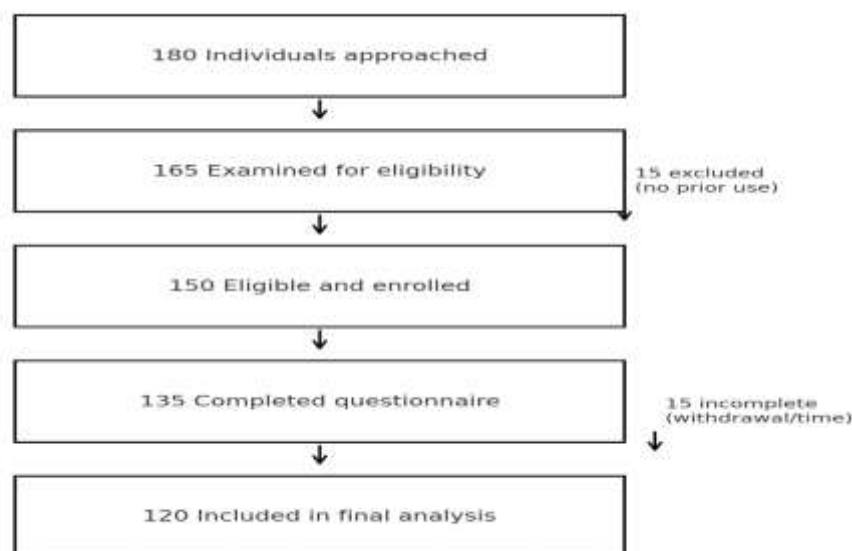


Figure 1: Participant Flow Diagram

Quantitative Findings

A total of 150 participants (60 males and 90 females) were surveyed across five rural and peri-urban communities in KwaZulu-Natal. The mean age of respondents was 45 years (range: 18–78 years). The survey revealed the following key patterns:

- ❖ **Prevalence of Use:**
124 participants (82.7%) reported current or past use of the African Potato for medicinal purposes.
- ❖ **Primary Health Conditions Treated:**
 - HIV-related immune support – 40.3%
 - Arthritis and joint pain – 31.5%
 - Diabetes management – 28.2%
 - Common colds and flu – 22.6%
 - Cancer support therapy – 10.5%
- ❖ **Frequency of Use:**
 - Daily – 25%
 - Weekly – 37%
 - Occasionally (as needed) – 38%
- ❖ **Mode of Preparation:**
 - Decoctions (boiled root) – 55%
 - Powders/capsules purchased from herbal markets – 30%
 - Infused with other herbs – 15%
- ❖ **Perceived Effectiveness:**

- 78% of users reported moderate to significant improvement in symptoms after use.
- 12% reported no observable change.
- 10% expressed uncertainty or had discontinued use due to taste or lack of access.

Qualitative Findings

Interviews with 15 traditional healers and 10 community elders revealed deep-rooted cultural beliefs and trust in the African Potato as a healing plant.

- ❖ **Cultural Significance:**
The plant is referred to as "*inkomfe*" in isiZulu and is considered both a physical and spiritual medicine. It is commonly used in rituals for cleansing, strength, and spiritual protection.
- ❖ **Perceived Benefits:**
 - "This plant gives strength when the body is weak."
 - "I've seen patients regain energy after using inkomfe, especially those with HIV."
 - "We believe it brings balance between the body and the ancestors."

❖ **Concerns and Limitations:**
Traditional practitioners acknowledged challenges such as:

- Lack of standardized dosages
- Inconsistent potency in commercially sold products
- Increasing scarcity of wild plants due to overharvesting

❖ **Integration with Formal Healthcare:**
Participants expressed cautious optimism about integrating African Potato into formal health systems, provided traditional knowledge is respected and practitioners are included in policy decisions.

Figure 2 reveals that the African Potato is most frequently used for immune support in individuals living with HIV, with 40.3% of participants indicating this as their primary use. This aligns with its traditional classification as an immune-boosting plant in Indigenous Knowledge Systems. The next most common conditions treated include arthritis (31.5%) and diabetes (28.2%), both chronic inflammatory diseases. A notable proportion of respondents (22.6%) also use the plant for common colds and flu, suggesting its perceived general health benefits. Cancer support (10.5%), though lower, reflects its complementary role in managing complex illnesses. The diversity of uses underscores the plant's wide application in primary health care within traditional healing contexts.

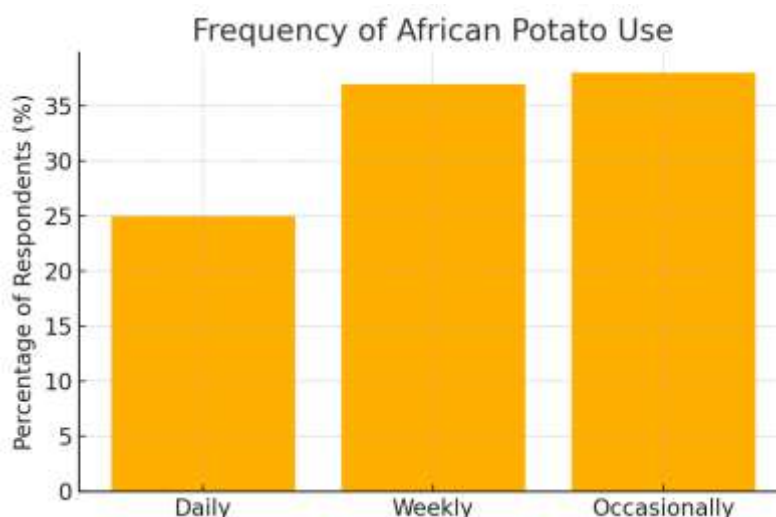


Figure 2: The graph represents the frequency of use of the African potato

Figure 3 highlights the frequency with which the African Potato is consumed. A majority of users take it weekly (37%), indicating a pattern of sustained but moderate usage. Occasional users make up 38%, suggesting that some individuals rely on the plant only during illness or specific health episodes. A smaller group (25%) reported daily use, often for chronic conditions like HIV or

diabetes. This pattern reflects both the perceived potency of the plant and community beliefs that overuse may not be advisable without proper dosage knowledge. The variability in frequency also signals the absence of standard dosing, reinforcing the need for guidelines if it is to be integrated into formal health systems.

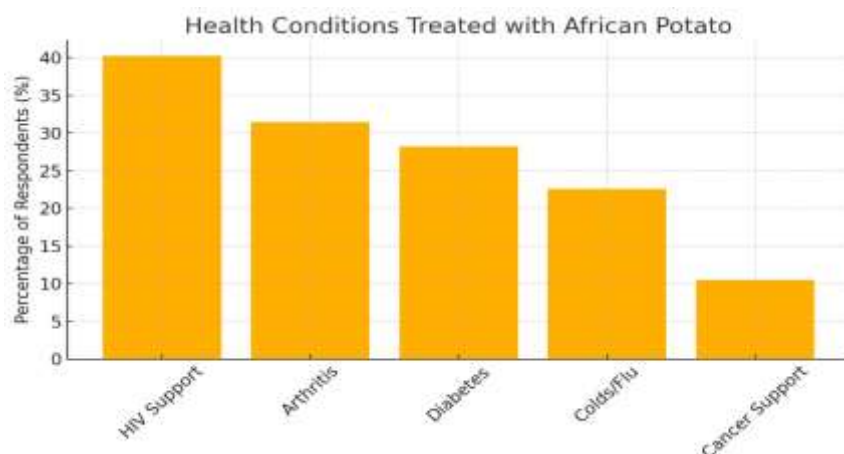


Figure 3: The graphs represent the health conditions treated with the African potato

Figure 4 demonstrates strong confidence in the plant's medicinal properties, with 78% of participants reporting noticeable symptom improvement. This is a significant finding that supports its continued use and suggests a potential basis for further clinical study. A smaller proportion (12%) experienced no change, which may be due to differences in preparation methods, severity of

conditions, or possible misidentification of the plant. 10% of users were uncertain or had discontinued use, mainly due to bitter taste, lack of access, or unclear results. Despite this, the overwhelmingly positive response indicates that the African Potato holds considerable value in community health, particularly when integrated with indigenous knowledge.

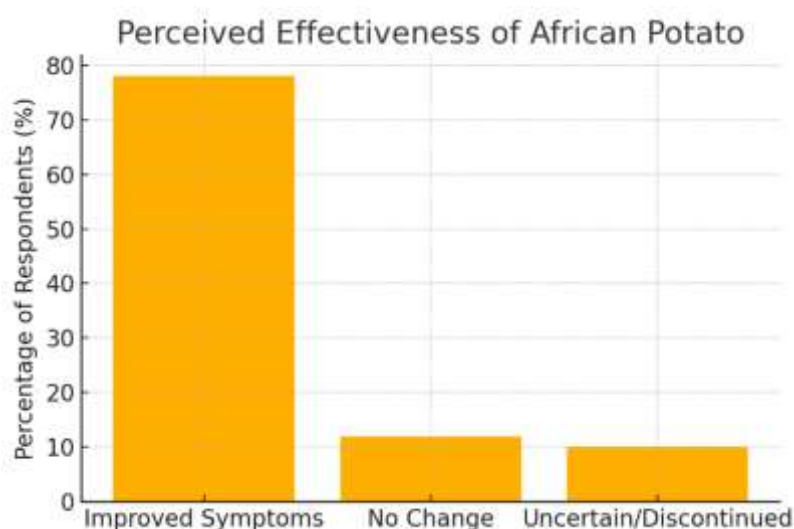


Figure 4: The graph represents the perceived effectiveness of the African potato

Discussion

This study aimed to explore the ethnopharmacological relevance of the African Potato (*Hypoxis hemerocallidea*) within rural and peri-urban communities in KwaZulu-Natal, South Africa. The findings reveal that the plant

continues to play a pivotal role in Indigenous healthcare practices, particularly for managing chronic diseases such as HIV, diabetes, and arthritis. This aligns with previous research by Moyo et al. (2016), who documented the immune-modulatory and anti-inflammatory properties of



Hypoxis hemerocallidea, particularly its sterolins (e.g., β -sitosterol), which have been linked to enhanced immune function. The high prevalence of use for HIV-related immune support (40.3%) is consistent with findings by Simbayi (2020), who reported that many people living with HIV in South Africa use traditional medicines alongside antiretroviral therapy (ART). Community members in our study reported noticeable improvements in energy levels and general well-being after using the African Potato, affirming its perceived effectiveness. However, as highlighted by UNAIDS (2020), the integration of traditional medicine with biomedical care requires caution, particularly due to potential drug-herb interactions.

In terms of diabetes and arthritis, the results (28.2% and 31.5% respectively) echo the work of Pillay et al. (2021), who found that traditional healers commonly recommend the African Potato for inflammatory and degenerative conditions. These conditions are prevalent in aging populations, and the African Potato is believed to provide relief through its antioxidant mechanisms. Similarly, Mbelle et al. (2019) demonstrated in vitro evidence supporting the anti-inflammatory properties of *Hypoxis* extracts, though they cautioned against unregulated dosages and poor standardization of products in local markets. The frequency of use and methods of preparation in this study suggest a deep cultural familiarity but also expose the lack of standardized protocols. While 25% of participants used the plant daily, 38% reported using it occasionally. This variability points to the absence of clear dosage guidelines, a challenge also noted by Ndlovu & Moyo (2017), who emphasized the need for dosage studies to avoid toxicity or inefficacy.

From a public health standpoint, the perceived effectiveness (78%) is a strong indicator of the trust and reliance communities place on this plant. Yet, despite such high confidence, formal scientific backing remains limited. Our qualitative findings also confirmed concerns about overharvesting and sustainability, reflecting issues raised by de Villiers (2016) regarding the loss of valuable medicinal species due to environmental degradation and commercial exploitation. The cultural significance of the plant, often used for both physical and spiritual ailments, reinforces the broader theme of "Harnessing African Indigenous Knowledge for Good Health and Well-being." Traditional healers expressed a willingness to collaborate with researchers, provided their knowledge is respected and not extracted without benefit-sharing, a sentiment aligned with the ethical frameworks proposed by Haslam (1990) and Naiman (1992).

Generalizability

Due to the focus on selected communities within KwaZulu-Natal, the findings may not be generalizable to all regions of South Africa or to populations with differing cultural or ecological contexts. However, the themes uncovered, such as traditional knowledge trust, health-seeking behaviour, and the medicinal uses of the African Potato, are likely transferable to similar Indigenous knowledge systems across southern Africa.

Conclusion

This study confirms the African Potato (*Hypoxis hemerocallidea*) as a cornerstone of Indigenous health practices in KwaZulu-Natal, widely used to manage conditions such as HIV, arthritis, and diabetes. The strong community belief in its efficacy, particularly in immune support, is supported by anecdotal evidence and limited scientific literature. However, the lack of standardization, dosage control, and clinical trials poses a barrier to formal integration into national healthcare systems. Bridging Indigenous knowledge with modern science presents an opportunity to improve health outcomes, promote cultural continuity, and address chronic disease burdens in under-resourced settings.

Limitations

This study was limited by its cross-sectional design, which only captures a snapshot in time and cannot establish causality. Data were self-reported, introducing potential recall and social desirability bias. The sample size, while adequate for exploratory analysis, may not represent all cultural or regional views on African Potato use. Additionally, the study relied on non-clinical measures of effectiveness and did not include laboratory or pharmacological assessments.

Recommendations

To harness the full potential of the African Potato (*Hypoxis hemerocallidea*) in promoting public health, especially within Indigenous communities, several key recommendations emerge from this study. First, it is essential to initiate comprehensive pharmacological and toxicological research to validate the therapeutic claims of the African Potato. While the plant is widely used and trusted by local communities, scientific evidence remains limited, particularly regarding appropriate dosages, potential side effects, and interactions with conventional medications such as antiretrovirals. Establishing a solid empirical foundation would support safe integration into national healthcare protocols. Second, the integration of traditional knowledge into primary healthcare systems should be pursued through inclusive, respectful



collaborations between biomedical professionals and traditional healers. Such partnerships could help bridge the gap between Indigenous practices and modern medicine, fostering mutual understanding and enhancing patient-centered care. This integration should be guided by ethical frameworks that recognize and protect the intellectual property and cultural heritage of Indigenous healers.

Another pressing recommendation is the standardization and regulation of African Potato-based products. Many users reported inconsistent results, which may stem from variations in preparation methods or the quality of commercial formulations. Government bodies, in collaboration with academic institutions and traditional authorities, should develop guidelines for cultivation, harvesting, processing, and distribution to ensure product safety, consistency, and efficacy. Sustainability also demands urgent attention. The growing popularity of the African Potato has led to increased harvesting pressure on wild populations, raising concerns about ecological degradation and long-term availability. Encouraging community-based cultivation programs could help reduce pressure on wild stocks, while simultaneously providing economic opportunities for rural households. Lastly, public health campaigns and educational outreach are necessary to inform communities about the safe and responsible use of the African Potato. Many users rely on anecdotal knowledge passed down orally, which can sometimes lead to misuse or unrealistic expectations. Providing accessible, evidence-based information will empower individuals to make informed health decisions while respecting the cultural significance of traditional medicine.

Biography

Dr. Sibonelo Thanda Mbanjwa is a dedicated lecturer in the Department of Nature Conservation at Mangosuthu University of Technology (MUT), South Africa. He holds a Ph.D. in Environmental Science and specializes in biodiversity conservation, sustainable development, and environmental education. Dr. Mbanjwa is deeply committed to community engagement, student mentorship, and the integration of indigenous knowledge systems into conservation practices. His work bridges academia and practical application, empowering students and communities through innovative teaching, research, and outreach initiatives.

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Competing Interests

The author has no relevant financial or non-financial interests to disclose.

Author Contributions

I, the author, contributed to the study conception and design. Material preparation, data collection, and research were performed by Mbanjwa S.T. The first draft was written by Mbanjwa S.T.

Data Availability

The data supporting the findings of this study are available upon reasonable request from the corresponding author. Due to ethical considerations and confidentiality agreements, individual participant data cannot be publicly shared. However, anonymized and aggregated data may be provided for academic or research purposes upon institutional approval.

Conflict of interest

The author declares no conflicts of interest.

List of abbreviations

AIKS - African Indigenous Knowledge Systems
ART - Antiretroviral Therapy
UNAIDS - United Nations Programme on HIV/AIDS
HIV – Human Immune System
AIDS - Acquired Immune Deficiency Syndrome

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