

*Sustainable Development in times of Turmoil: Implementing Indigenous Solutions for Climate Mitigation and Adaptation in Africa*

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**Kariuki Muigua**

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**Sustainable Development in times of Turmoil: Implementing Indigenous Solutions for Climate Mitigation and Adaptation in Africa**

**Kariuki Muigua\***

**Abstract**

*This paper examines how indigenous solutions can be implemented for climate mitigation and adaptation in Africa. The paper observes that climate change is a major threat in the pursuit of Sustainable Development in Africa. It examines the impacts of climate change on Sustainable Development in Africa. In light of its adverse impacts, the paper posits that combating climate change in Africa is necessary towards ensuring Sustainable Development in times of turmoil. The paper argues that indigenous solutions provide a valuable and appropriate approach towards tackling climate change for Sustainable Development in Africa. It discusses some of the key indigenous solutions and their role in confronting climate change in Africa. In addition, the paper examines some of the challenges undermining the use of indigenous solutions in climate action in Africa. In light of these concerns, the paper proposes ways through which indigenous solutions can be effectively implemented for climate mitigation and adaptation in Africa towards Sustainable Development.*

**1.0 Introduction**

Sustainable Development has been described as a multidimensional model of development which limits economic growth and other human activities to the capacity of nature for self-regeneration, places the improvement of the human condition (including social and human development) as its primary goal, and places environmental conservation at the core of any economic, political, legal, social, educational, scientific

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\* PhD in Law (Nrb),SC, FCI Arb (Chartered Arbitrator),OGW, LL. B (Hons) Nrb, LL.M (Environmental Law) Nrb; Dip. In Law (KSL); FCPS (K); Dip. in Arbitration (UK); MKIM; Mediator; Consultant: Lead expert EIA/EA NEMA; BSI ISO/IEC 27001:2005 ISMS Lead Auditor/ Implementer; ESG Consultant; Advocate of the High Court of Kenya; Professor of Environmental Law and Conflict Management at the University of Nairobi, Faculty of Law; Member of the Permanent Court of Arbitration (PCA) [January, 2026].

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and cultural strategy<sup>1</sup>. It has been observed that Sustainable Development is both an ideal and principle geared towards meeting human development goals and needs while at the same time ensuring the ability of nature to provide the natural resources and ecosystem services upon which the economy and society depends<sup>2</sup>. According to the United Nations, Sustainable Development envisions how we must live today if we want to ensure a better tomorrow, by meeting present needs without compromising the chances of future generations to meet their needs<sup>3</sup>.

Sustainable Development can therefore be described as development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs<sup>4</sup>. This concept has been embraced by all nations as the global blueprint for development. The United Nations *2030 Agenda for Sustainable Development*<sup>5</sup> provides a framework for achieving this ideal through 17 Sustainable Development Goals (SDGs) which provide an integrated approach that balances the social, economic and environmental facets of development<sup>6</sup>.

Achieving Sustainable Development is therefore key towards ensuring harmony with nature for the benefit of current and future generations. However, achieving this dream remains an elusive goal throughout the world. For example, socio-economic challenges such as poverty, rising inequalities within and among nations, gender inequalities,

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<sup>1</sup> Nieto. C. C., & Neotropica. F., 'Toward a Holistic Approach to the Ideal of Sustainability' *Phil & Tech*, 2:2 Winter 1997

<sup>2</sup> Mensah. J., 'Sustainable Development: Meaning, history, principles, pillars, and implications for human action: Literature review' *Cogent Social Sciences*, Volume 5, Issue 1

<sup>3</sup> United Nations., 'Sustainable Development' Available at <https://www.un.org/sustainabledevelopment/blog/2023/08/what-is-sustainable-development/> (Accessed on 12/01/2026)

<sup>4</sup> World Commission on Environment and Development., 'Our Common Future.' Oxford, (Oxford University Press, 1987)

<sup>5</sup> United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (Accessed on 12/01/2026)

<sup>6</sup> Ibid

unemployment, global health threats and conflicts impede progress towards Sustainable Development<sup>7</sup>. In addition environmental threats including depletion of natural resources, environmental degradation, desertification, drought, freshwater scarcity, biodiversity loss and climate change are a major threat to Sustainable Development<sup>8</sup>.

Climate change in particular undermines the ability of all nations to achieve Sustainable Development. Climate change has been described as an undesirable phenomenon that affects realization of the Sustainable Development agenda across the world by affecting the sustainability of the planet's ecosystems, the stability of the global economy and the future of humankind<sup>9</sup>. The impacts of climate change including intense droughts, water scarcity, severe wild fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity are being witnessed all over the world affecting the achievement of Sustainable Development<sup>10</sup>. The 2030 Agenda for Sustainable Development acknowledges that climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve Sustainable Development<sup>11</sup>. Consequently, SDG 13 under the Agenda urges all states to take urgent action to combat climate change and its impacts for Sustainable Development<sup>12</sup>. Confronting climate change is therefore vital towards ensuring Sustainable Development in times of turmoil.

This paper examines how indigenous solutions can be implemented for climate mitigation and adaptation in Africa. The paper observes that climate change is a major

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<sup>7</sup> United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Op Cit

<sup>8</sup> Ibid

<sup>9</sup> Climate Change., 'Meaning, Definition, Causes, Examples and Consequences.' Available at <https://youmatter.world/en/definition/climate-change-meaning-definition-causes-and-consequences/> (Accessed on 12/01/2026)

<sup>10</sup> United Nations., 'What is Climate Change?' Available at <https://www.un.org/en/climatechange/what-is-climate-change> (Accessed on 12/01/2026)

<sup>11</sup> Ibid

<sup>12</sup> Ibid

threat in the pursuit of Sustainable Development in Africa. It examines the impacts of climate change on Sustainable Development in Africa. In light of its adverse impacts, the paper posits that combating climate change in Africa is necessary towards ensuring Sustainable Development in times of turmoil. The paper argues that indigenous solutions provide a valuable and appropriate approach towards tackling climate change for Sustainable Development in Africa. It discusses some of the key indigenous solutions and their role in confronting climate change in Africa. In addition, the paper examines some of the challenges undermining the use of indigenous solutions in climate action in Africa. In light of these concerns, the paper proposes ways through which indigenous solutions can be effectively implemented for climate mitigation and adaptation in Africa towards Sustainable Development.

## **2.0 Impact of Climate Change on Sustainable Development in Africa**

Climate change is a major threat in the pursuit of Sustainable Development in Africa. It has been observed that Africa is the most vulnerable region to climate change and its impacts<sup>13</sup>. Despite having the least greenhouse gas emissions, Africa stands out disproportionately as the region that is most impacted by climate change<sup>14</sup>. Africa's extreme vulnerability to climate change has been attributed to several factors. For example, the prevailing low levels of socio-economic development in the continent means that African countries and communities cannot effectively anticipate, cope, address and adapt to adverse climatic events<sup>15</sup>. Further, it has been observed that Africa's strong dependence on weather-sensitive economic activities including rain-fed agriculture, fishing and herding means that the impact of climate change on these activities pushes Africa's economies and livelihoods of millions of people into extreme

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<sup>13</sup> African Development Bank Group., 'Climate Change in Africa' Available at <https://www.afdb.org/en/cop25/climate-change-africa> (Accessed on 12/01/2026)

<sup>14</sup> United Nations Environment Programme., 'Responding to Climate Change' Available at <https://www.unep.org/regions/africa/regional-initiatives/responding-climate-change> (Accessed on 12/01/2026)

<sup>15</sup> Ibid

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vulnerability<sup>16</sup>. In addition, it has been pointed out that weak economies, weak institutions and inadequately developed governance structures undermine effective climate action in Africa<sup>17</sup>.

Due to the foregoing unfavourable factors, climate change is impeding Sustainable Development in Africa. It has been observed that climate change is impacting water, food and health systems and entire ecosystems in Africa with severe consequences for people and planet<sup>18</sup>. Further, coastal cities and communities in Africa, especially those close to major river deltas are highly vulnerable to sea-level rise with threats to livelihoods, infrastructure and marine biodiversity<sup>19</sup>. It has been argued that climate change hinders Sustainable Development in Africa by fuelling economic losses, affecting socio-economic growth and pushing millions of people into extreme levels of poverty<sup>20</sup>. Adverse climatic events including warmer temperatures, extreme droughts and floods are worsening in Africa impacting human life, livelihoods and economic growth<sup>21</sup>. Climate change is fuelling massive humanitarian crises in Africa with severe impacts on agriculture, food and water security, education, public health, energy, infrastructure, peace and security<sup>22</sup>.

Due to its adverse impacts, it has been argued that climate change is a major challenge to both current and future development progress in Africa<sup>23</sup>. Addressing climate change is therefore vital towards fostering the Sustainable Development agenda in Africa. At a

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<sup>16</sup> African Development Bank Group., 'Climate Change in Africa' Op Cit

<sup>17</sup> United Nations Economic Commission for Africa., 'Vulnerability to Climate Change in Africa: Challenges and Recommendations for Africa' Available at [https://archive.uneca.org/sites/default/files/PublicationFiles/policy\\_brief\\_2\\_vulnerability\\_to\\_climate\\_change\\_in\\_africa\\_challenges\\_and\\_recommendations\\_for\\_africa.pdf](https://archive.uneca.org/sites/default/files/PublicationFiles/policy_brief_2_vulnerability_to_climate_change_in_africa_challenges_and_recommendations_for_africa.pdf) (Accessed on 12/01/2026)

<sup>18</sup> Ibid

<sup>19</sup> Ibid

<sup>20</sup> African Development Bank Group., 'Climate Change in Africa' Op Cit

<sup>21</sup> World Meteorological Organization., 'Africa faces disproportionate burden from climate change and adaptation costs' Available at <https://wmo.int/news/media-centre/africa-faces-disproportionate-burden-from-climate-change-and-adaptation-costs> (Accessed on 12/01/2026)

<sup>22</sup> Ibid

<sup>23</sup> Bishop. R., 'Confronting Climate Change' Available at <https://www.brookings.edu/articles/confronting-climate-change/> (Accessed on 12/01/2026)

continental level, African Union's *Agenda 2063*<sup>24</sup> recognizes that while Africa has played a relatively minor role and contributed little to the accumulation of greenhouse gases and the attendant climate change, it is the most vulnerable region in the world to climate change risks<sup>25</sup>. It seeks to foster environmentally sustainable and climate resilient economies and communities in Africa for Sustainable Development<sup>26</sup>. Further, at a regional level, the *East African Community Climate Change Policy*<sup>27</sup> recognizes the adverse impacts of climate change as a major challenge to socio-economic development both globally and within the East African region. The Policy aims to enhance Sustainable Development within the East African region through harmonized and coordinated regional strategies, programmes and actions to respond to climate change<sup>28</sup>. In addition, at a national level, Kenya has enacted the *Climate Change Act*<sup>29</sup> in order to enhance the national response to climate change and achieve low carbon climate development for Sustainable Development<sup>30</sup>. Confronting climate change in Africa is therefore a key continental priority towards ensuring Sustainable Development in times of turmoil.

### **3.0 Indigenous Solutions for Climate Mitigation and Adaptation in Africa: Promises and Pitfalls**

Climate change affects the attainment of Sustainable Development both globally and in Africa. Confronting climate change is therefore an urgent and crucial towards fostering Sustainable Development in the wake of a mounting climate crisis. Tackling climate change involves mitigation and adaptation efforts. It has been observed that mitigation involves reducing greenhouse gas emissions and stopping the problem of climate change from growing<sup>31</sup>. Mitigation requires large-scale investments in key sectors such as renewable energy, sustainable transport and infrastructure, sustainable agriculture and

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<sup>24</sup> African Union., 'Agenda 2063: The Africa we Want.' Available at [https://au.int/sites/default/files/documents/33126-doc-framework\\_document\\_book.pdf](https://au.int/sites/default/files/documents/33126-doc-framework_document_book.pdf) (Accessed on 12/01/2026)

<sup>25</sup> Ibid

<sup>26</sup> Ibid

<sup>27</sup> East African Community., 'East African Community Climate Change Policy.' Available at <https://www.eac.int/environment/climate-change/eac-climate-change-policy-framework> (Accessed on 12/01/2026)

<sup>28</sup> Ibid

<sup>29</sup> Climate Change Act., No. 11 of 2016, Government Printer, Nairobi

<sup>30</sup> Ibid, S 3(1)

<sup>31</sup> World Vision., 'How is the World Responding to Climate Change?' Available at [https://www.worldvision.com.au/docs/default-source/school-resources/how-is-the-worldresponding-to-climate-change.pdf?sfvrsn=32021b89\\_0](https://www.worldvision.com.au/docs/default-source/school-resources/how-is-the-worldresponding-to-climate-change.pdf?sfvrsn=32021b89_0) (Accessed on 12/01/2026)

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a sustainable Blue Economy in order to significantly reduce greenhouse gas emissions towards tackling climate change<sup>32</sup>. Adaptation on the other hand involves learning how to live with the existing threat of climate change and protecting humanity from the current and future effects of climate change<sup>33</sup>. It has been observed that adaptation covers a wide range of measures to reduce vulnerability to the impacts of climate change<sup>34</sup>. These measures include planting crop varieties that are more resistant to drought, enhancing climate information and early warning systems and building stronger defences against floods and other adverse climatic events<sup>35</sup>.

It has been observed that indigenous solutions are crucial in strengthening climate mitigation and adaptation for Sustainable Development<sup>36</sup>. Indigenous peoples and local communities all over the world are custodians of unique and valuable knowledge systems and practices that emphasize harmony between people and planet<sup>37</sup>. These practices have a minimal impact on the environment and are highly adaptive to ecological changes, fostering healthy and resilient ecosystems and are therefore an effective solution towards tackling climate change among other environmental threats<sup>38</sup>. Indigenous knowledge systems and practices play a key role in climate mitigation and adaptation through sustainable resource governance, climate-resilient agricultural practices and sound biodiversity conservation<sup>39</sup>. They also have the potential to strengthen the resilience of people and ecosystems against adverse climatic events<sup>40</sup>. It

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<sup>32</sup> United Nations Climate Change., 'Introduction to Climate Finance.' Available at <https://unfccc.int/topics/introduction-to-climate-finance> (Accessed on 12/01/2026)

<sup>33</sup> World Vision., 'How is the World Responding to Climate Change?' Op Cit

<sup>34</sup> United Nations Development Programme., 'What is climate change adaptation and why is it crucial?' Available at <https://climatepromise.undp.org/news-and-stories/what-climate-change-adaptation-and-why-it-crucial> (Accessed on 12/01/2026)

<sup>35</sup> Ibid

<sup>36</sup> United Nations Development Programme., 'Indigenous knowledge is crucial in the fight against climate change - here's why' Available at <https://climatepromise.undp.org/news-and-stories/indigenous-knowledge-crucial-fight-against-climate-change-heres-why> (Accessed on 12/01/2026)

<sup>37</sup> Ibid

<sup>38</sup> Ibid

<sup>39</sup> Filho. W.L et al., 'The role of indigenous knowledge in climate change adaptation in Africa' *Environmental Science & Policy*., Volume 136, 2022., pp 250-260

<sup>40</sup> Ibid

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has been argued that indigenous solutions can make an important contribution to climate change policy and SDG 13 on climate action through observing changing climate patterns, evolving methods to convert observation and knowledge into relevant data, adapting to impacts and contributing to global mitigation efforts<sup>41</sup>.

Indigenous solutions can therefore strengthen climate mitigation and adaptation efforts in Africa for Sustainable Development. It has been correctly noted that utilizing indigenous knowledge in African countries is crucial towards addressing the impacts of climate change in the continent. For instance, indigenous solutions can provide valuable insights into climate adaptation strategies, including rainwater harvesting and sustainable farming practices<sup>42</sup>. Indigenous peoples and local communities in Africa have adopted climate-resilient agricultural practices including agroforestry, terracing and the use of indigenous and drought-resistant crops such as millet, sorghum, and cassava to conserve moisture, promote soil health, and improve crop yields thus bolstering food security and effectively adapting to the impacts of climate change on agriculture and food production<sup>43</sup>. Further, by conserving key ecosystems such as forests which act as carbon sinks, indigenous solutions have the potential to bolster climate mitigation<sup>44</sup>.

It has been observed that indigenous peoples and local communities in Africa have developed deep and sophisticated indigenous knowledge systems and practices, based on their observations and interactions with the environment over generations that have enabled them to harness ecosystem services to support their livelihoods and survive

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<sup>41</sup> United Nations Educational, Scientific, and Cultural Organization., 'Harnessing Indigenous Knowledge for Climate Risk Management' Available at <https://www.unesco.org/en/articles/harnessing-indigenous-knowledge-climate-risk-management> (Accessed on 12/01/2026)

<sup>42</sup> Brown. C. H., 'Sustainable Solutions for Climate Change Adaptation in Africa: Combining Indigenous Knowledge and Modern Technology' Available at <https://sdgs.un.org/sites/default/files/2023-05/B38%20-%20Brown%20-%20Assessing%20African%20Led%20Science-Technological%20Innovation%20Approaches%20to%20Climate%20Change%20Adaptation.pdf> (Accessed on 12/01/2026)

<sup>43</sup> Ibid

<sup>44</sup> United Nations Development Programme., 'Indigenous knowledge is crucial in the fight against climate change – here's why' Op Cit

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socioecological changes including climate change<sup>45</sup>. For instance, through long-term observations, indigenous peoples and local communities have developed valuable data and insights on climate patterns and changes specific to Africa thus enabling them to effectively anticipate and adapt to adverse climatic events such as droughts and unpredictable rainfall patterns<sup>46</sup>. It has been pointed out that the integration of community-based forecasting and scientific forecasting has been successfully utilised to provide early warning weather and climate information for local communities in some parts of Africa<sup>47</sup>. Farmers, particularly in rural parts of Africa have developed special techniques for gathering, predicting, and interpreting certain indicators to anticipate the weather or seasonal climatic conditions for sound decision-making on planting and harvesting<sup>48</sup>. Further, sustainable agricultural practices, sustainable hunting and fishing methods, and sustainable conservation practices tailored to local ecosystems provide valuable indigenous solutions that can bolster climate mitigation and adaptation efforts in Africa<sup>49</sup>.

Indigenous solutions can thus strengthen climate action in Africa for Sustainable Development. However, exclusion of indigenous peoples and local communities from decision-making processes undermine the use of indigenous knowledge and practices towards confronting climate change<sup>50</sup>. Further, indigenous communities in Africa often face threats to their lands and traditional territories. They are often displaced and

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<sup>45</sup> Zougmore. R., Segnon. A., & Thornton. P., 'Harnessing Indigenous Knowledge and Practices for Effective Adaptation in the Sahel' Available at <https://doi.org/10.1016/j.cosust.2023.101389> (Accessed on 12/01/2026)

<sup>46</sup> Traditional Ecological Knowledge and Global Climate Change; A Global South Perspective on Climate Solutions., Available at <https://afo.or.tz/traditional-ecological-knowledge-and-global-climate-change-a-global-south-perspective-on-climate-solutions/> (Accessed on 12/01/2026)

<sup>47</sup> Africa Policy Research Institute., 'Harnessing Local Knowledge through Community-Based Interventions' Available at <https://afripoli.org/harnessing-local-knowledge-through-community-based-interventions> (Accessed on 12/01/2026)

<sup>48</sup> Attoh. E., & Ajayi. O., 'Indigenous Knowledge and Climate Change Adaptation in Africa: A Systematic Review' Available at <http://www.cabi.org/cabreviews> (Accessed on 12/01/2026)

<sup>49</sup> Ibid

<sup>50</sup> United Nations Development Programme., 'Indigenous knowledge is crucial in the fight against climate change – here's why' Op Cit

relocated due to mining and infrastructure development undermining their ability to practice sustainable resource management through indigenous solutions<sup>51</sup>. Indigenous solutions have also been largely ignored and dismissed in modern science-based climate action where they are deemed inferior and unscientific<sup>52</sup>. However, in light of the worsening climate crisis in Africa, it is imperative to implement indigenous solutions for effective climate mitigation and adaptation towards Sustainable Development.

#### **4.0 Conclusion**

Indigenous solutions provide valuable insights and approaches towards strengthening climate mitigation and adaptation in Africa for Sustainable Development. The knowledge and practices of indigenous peoples and local communities in Africa provide context-specific solutions that can be applied in sustainable resource governance, coping with climate impacts, forecasting and managing climate-induced hazards<sup>53</sup>. These solutions are also widely-accepted by communities all over Africa and can therefore be easily integrated into climate action for Sustainable Development<sup>54</sup>. It is therefore imperative to implement indigenous solutions for climate change mitigation and adaptation in Africa. Achieving this dream involves giving indigenous peoples and local communities more voice in decision-making processes on climate change<sup>55</sup>. Through this, it is possible to harness indigenous and local solutions for effective climate action<sup>56</sup>. It is also vital to uphold the land rights of indigenous peoples and local communities in order to enable them practice sustainable resource management and other forms of indigenous knowledge vital for climate action<sup>57</sup>. Further, establishing supporting legal and policy

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<sup>51</sup> Attoh. E., & Ajayi. O., 'Indigenous Knowledge and Climate Change Adaptation in Africa: A Systematic Review' Op Cit

<sup>52</sup> The African Manifesto for Science, Technology and Innovation., Available at [https://atpsnet.org/wp-content/uploads/2017/05/the\\_african\\_manifesto\\_for\\_sti.pdf](https://atpsnet.org/wp-content/uploads/2017/05/the_african_manifesto_for_sti.pdf) (Accessed on 12/01/2026)

<sup>53</sup> Filho. W.L et al., 'The role of indigenous knowledge in climate change adaptation in Africa' Op Cit

<sup>54</sup> Ibid

<sup>55</sup> Traditional Ecological Knowledge and Global Climate Change; A Global South Perspective on Climate Solutions., Op Cit

<sup>56</sup> Ibid

<sup>57</sup> United Nations Development Programme., 'Indigenous knowledge is crucial in the fight against climate change – here's why' Op Cit

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frameworks can ensure that indigenous and local solutions are legitimized and effectively applied in tackling climate change among other environmental challenges in Africa<sup>58</sup>. Preserving indigenous and local solutions is also vital in ensuring their application in climate mitigation and adaptation, now and in the future<sup>59</sup>.

Implementing indigenous solutions for climate mitigation and adaptation is an imperative that should be realised towards fostering Sustainable Development in times of turmoil.

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<sup>58</sup> Brown. C. H., 'Sustainable Solutions for Climate Change Adaptation in Africa: Combining Indigenous Knowledge and Modern Technology' Op Cit

<sup>59</sup> Latief. A., 'Harnessing Indigenous Knowledge for Climate Change Resilience in Africa' Available at [https://www.linkedin.com/pulse/harnessing-indigenous-knowledge-climate-change-africa-aatifah-latief/?utm\\_source=share&utm\\_medium=member\\_android&utm\\_campaign=share\\_via](https://www.linkedin.com/pulse/harnessing-indigenous-knowledge-climate-change-africa-aatifah-latief/?utm_source=share&utm_medium=member_android&utm_campaign=share_via) (Accessed on 12/01/2026)

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