E-Journal of Humanities, Arts and Social Sciences (EHASS)
ISSN – Online 2720-7722 | Print 2821-8949
Volume 4 Issue 13 December 2023 pp 1545-1552
Available online at: https://noyam.org/journals/ehass/
DOI: https://doi.org/10.38159/ehass.202341312

An Analysis of Climate Change Threats to Cultural Practices: A Case Study of the Dikgale Community, South Africa

Sejabaledi Agnes Rankoana[1]

[1] Department of Sociology and Anthropology. University of Limpopo, Limpopo Province, South Africa.

ABSTRACT

Scientists and policymakers are failing to account for the influence of climate change on many facets of cultural life. Much emphasis is placed on the effects of climate change on agriculture, with less emphasis placed on how low crop and livestock output may affect socio-cultural activities. The current study investigated the effects of climate change on the socio-cultural practices of the Dikgale community in South Africa's Limpopo Province. Semi-structured interviews were conducted with 150 participants purposely selected in a rural community. The study's findings revealed that cultural activities that foster communities' cohesion are already under threat from the effects of climate change. Temperature fluctuations and irregular rainfall negatively impacted cultural festivities such as the first fruit rituals, rain-making rituals, cultural entertainments, and bride price payment. To complete the rites and meet marital requirements, subsistence crops and cattle are used. Poor subsistence crop and livestock production has left the rituals obsolete, and as a result, these customs are rarely practised and have been supplanted by western practices. If this cultural heritage is lost, rural communities will lose significant social, cultural, and economic values. The study contributes to the less documented intangible cultural heritage dimensions impacted by climate change.

Correspondence
Sejabaledi Agnes Rankoana
Email:
sejabaledi.rankoana@ul.ac.za

Publication History
Received 28th June, 2023
Accepted 3rd October 2023
Published online:
21st December, 2023

Keywords: Climate Change, Socio-Cultural Practices, Cultural Heritage, Limpopo Province

INTRODUCTION

Culture is a set of guidelines that individuals inherit as members of a particular society and that tells them how to view the world, experience it, and behave in relation to other people, to supernatural forces or beings, and to the natural environment.[1] Human culture is strongly influenced by ecosystems, and ecosystem change can have a significant impact on cultural identity and social stability. Human cultures, knowledge systems, religions, heritage values, social interactions, and the linked amenity services (such as aesthetic enjoyment, recreation, artistic and spiritual fulfilment, and intellectual development) have always been influenced and shaped by the nature of the ecosystem and eco-system conditions on which culture is based. At the same time, humankind has always influenced and shaped its environment. Rapid loss of culturally valued ecosystems and landscapes leads to social disruptions and societal marginalization, which are now occurring in many parts of the world.[2] Humans relate to the natural environment because they depend on natural resources for the fulfilment of basic needs such as food, health care, shelter, and water.

[1] Cecil Helman, *Culture, Health and Illness* (CRC press, 2007).
[2] Millennium Ecosystem Assessment, "Cultural and Amenity Services," *Ecosystems and Human Well-Being, Rd Groot and PS Ramakrishnan, Editors*, 2005, 457–75.

Any change in the natural environment, on the other hand, would invariably influence the provision of basic requirements, as well as the associated livelihood patterns, connections, and interactions. The most noticeable changes in the natural environment are rising temperatures and variability in rainfall, which have a severe impact on agriculture and cattle output. Local communities that still respect their cultural traditions, such as subsistence crop and livestock production, which is a primary predictor of other cultural observances, such as rituals, celebrations, and other customs, are most affected by these differences. These are aspects of society's cultural heritage that define individual and collective identity, give evidence for previous events, and contribute to wellbeing through engagement.[3] Changes in the environment and environmental systems may negatively influence and impact these intangible heritage resources and associated values.[4]

Climate change stands to impact the species and ecosystems that constitute indigenous foods that are vital to a culture. It is indirectly affecting the diverse cultural resources of rural communities. Most of these form part of communities' intangible heritage, which is dependent upon other cultural practices that are climate-reliant. For example, the performance of cultural celebrations is dependent upon a good crop or livestock production dedicated to supernatural beings and the provision of food to the celebrants. Poor production of crops and livestock because of climate change would mean the cessation of the most important cultural practices. Poor subsistence production of crops and livestock because of rainfall scarcity is the main challenge facing rural communities. This challenges society's ability to sustain its cultural values, as they are climate-reliant. As a result, the indirect effects of environmental change on life experience, spiritual considerations, family, kinship, and oral history are often the most obvious direct effects of climate change.[5]

Changes in rainfall and temperature patterns are the most remarkable variations in the natural environment reported by the Intergovernmental Panel on Climate Change.[6] These changes and their threats to human livelihood are mostly remarkable in rural areas, whose livelihood patterns are still reliant on natural resources. This report supports observations that local people who depend directly or indirectly on agriculture, especially rain-fed agriculture, for their livelihoods, have few assets or strategies to cope with the changes.[7] Other observed effects of climate change include reduced reliability of rainfall, increased frequency of extreme events such as prolonged dry spells, droughts, and floods, as well as poor intra-seasonal spatial and temporal distribution of seasonal rainfall.[8] Social cohesion and indigenous knowledge are some of the most obvious cultural heritages negatively impacted by rising temperatures and erratic rainfall patterns.[9] The present study describes the impacts of poor subsistence crop and livestock production on the culture because of rising temperatures and erratic rainfall.

LITERATURE REVIEW

It has become increasingly important for social scientists to examine how local populations experience, react to and adapt to climate change. Many researchers shared this viewpoint because they thought it would help them better grasp the social, cultural, and behavioural aspects of the repercussions of climate change and how people could adapt to them.[10] The goal of social scientists who study climate change is to learn how people all around the world react to and make sense of weather and climate shifts.[11] Evidence of a rise in the frequency and severity of floods, droughts, extreme weather events, and meteorological disasters can be seen in the results of the vast literature on climate change in local communities.[12] These changes negatively affected agricultural

[3] Scott Allan Orr, Jenny Richards, and Sandra Fatorić, "Climate Change and Cultural Heritage: A Systematic Literature Review (2016–2020)," *The Historic Environment: Policy & Practice* 12, no. 3–4 (October 2, 2021): 434–77, https://doi.org/10.1080/17567505.2021.1957264.

[4] Mercedes Fourment et al., "Local Perceptions, Vulnerability and Adaptive Responses to Climate Change and Variability in a Winegrowing Region in Uruguay," *Environmental Management* 66 (2020): 590–99.

[5] IWGIA News, "International Work Group for Indigenous Affairs. International Year of Indigenous Languages, ," https://www.iwgia.org/en/news/3302-year-of-indigenous-languages.html., January 2019.

[6] Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers," in *The Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York: Cambridge University Press, 2013).

[7] Jasmine Pearson, Guy Jackson, and Karen E McNamara, "Climate-Driven Losses to Knowledge Systems and Cultural Heritage: A Literature Review Exploring the Impacts on Indigenous and Local Cultures," *The Anthropocene Review* 10, no. 2 (August 15, 2023): 343–66, https://doi.org/10.1177/20530196211005482.

[8] Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers."

[9] Pearson, Jackson, and McNamara, "Climate-Driven Losses to Knowledge Systems and Cultural Heritage: A Literature Review Exploring the Impacts on Indigenous and Local Cultures."

[10] Pearson, Jackson, and McNamara, "Climate-Driven Losses to Knowledge Systems and Cultural Heritage: A Literature Review Exploring the Impacts on Indigenous and Local Cultures."

[11] Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers."

[12] Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers"; Anne Babcock Hollowed et al., "Integrated Modeling to Evaluate Climate Change Impacts on Coupled Social-Ecological Systems in Alaska," *Frontiers in Marine Science* 6

production and water provision, leading to a change in cultural values and priorities. Changes in climatic conditions such as the timing or rainfall affect livelihoods, while extremes in weather and climate affect physical aspects of heritage and communities and populations that act as repositories of knowledge, skills, and practice.[13] Climate change directly threatens human health, with substantial impacts on indigenous peoples, who are uniquely vulnerable as climate-related events affect their practices, lifeways, self-determination, and physical and cultural health.[14] The loss and damage caused by climate change extend to cultural factors, including direct material losses as well as losses of mobility, displacement, loss of territory, loss of cultural heritage, or loss of local knowledge and language elements, among others.[15]

Climate change is negatively impacting dominant modes of production, consumption, lifestyles, and social organisation, which are collectively regarded as cultural heritage. These cultural values are closely interlinked with natural resources such as weather and rainfall.[16] Traditional and cultural knowledge and practices face key threats today for example, climate change is altering the nature and availability of natural resources thus altering associated cultural practices.[17] Climate-change-related impacts are causing the loss of tribal land and access to culturally important resources such as sacred sites, plant and animal species, water, and traditional homelands.[18] The impacts generated by climate change endanger human culture, the environment, and livelihood.[19] However, the cultural implications of climate change in South Africa have received little attention. The present study details the impacts of poor subsistence crop and livestock production as a result of climate change on the culture to understand the extent to which climate change has impacted the intangible cultural heritage of a local community in Limpopo Province, South Africa.

An Overview of the Study Area

Dikgale community is located within Polokwane Local Municipality approximately 40 km from Polokwane City, and 15 km from the University of Limpopo in Mankweng Township. The community covers an area of 71 square km and is 6 km long and 10.8 km wide. It is situated between 23.46ºC-23.48ºC south latitude and 29.42ºC-29.47ºC east longitude. It lies at an average altitude of 1400 above mean sea level. Dikgale area has an annual rainfall of approximately 505 mm. It has a daily average summer temperature of between 16ºC and 27ºC and between 5ºC and 19ºC in winter. Summer rainfall occurs between October and April, followed by a dry winter season.[20]

(January 14, 2020), https://doi.org/10.3389/fmars.2019.00775; Terence Darlington Mushore et al., "Climate Change Adaptation and Mitigation Strategies for Small Holder Farmers: A Case of Nyanga District in Zimbabwe," *Frontiers in Climate* 3 (August 6, 2021), https://doi.org/10.3389/fclim.2021.676495.

[13] Sara de Wit and Sophie Haines, "Climate Change Reception Studies in Anthropology," *WIREs Climate Change* 13, no. 1 (January 14, 2022), https://doi.org/10.1002/wcc.742.

[14] Paul J Schramm et al., "How Indigenous Communities Are Adapting To Climate Change: Insights From The Climate-Ready Tribes Initiative: Analysis Examines How Indigenous Communities Are Adapting to Climate Change.," *Health Affairs* 39, no. 12 (2020): 2153–59.

[15] IWGIA News, "International Work Group for Indigenous Affairs. International Year of Indigenous Languages."

[16] Jordan W. Smith, Dorothy H. Anderson, and Roger L. Moore, "Social Capital, Place Meanings, and Perceived Resilience to Climate Change*," *Rural Sociology* 77, no. 3 (September 20, 2012): 380–407, https://doi.org/10.1111/j.1549-0831.2012.00082.x.

[17] IWGIA News, "International Work Group for Indigenous Affairs. International Year of Indigenous Languages, "; Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers."

[18] Smith, Anderson, and Moore, "Social Capital, Place Meanings, and Perceived Resilience to Climate Change*."

[19] Justine Marrion Massey, *Climate Change, Culture and Cultural Rights* (UN, 2020), https://www.ohchr.org/sites/default/files/Documents/Issues/CulturalRights/Call_ClimateChange/JMassey.pdf.

[20] " Polokwane Local Municipality Integrated Development Plan 2022/2023," https://www.polokwane.gov.za/SPX News Article., 2022.

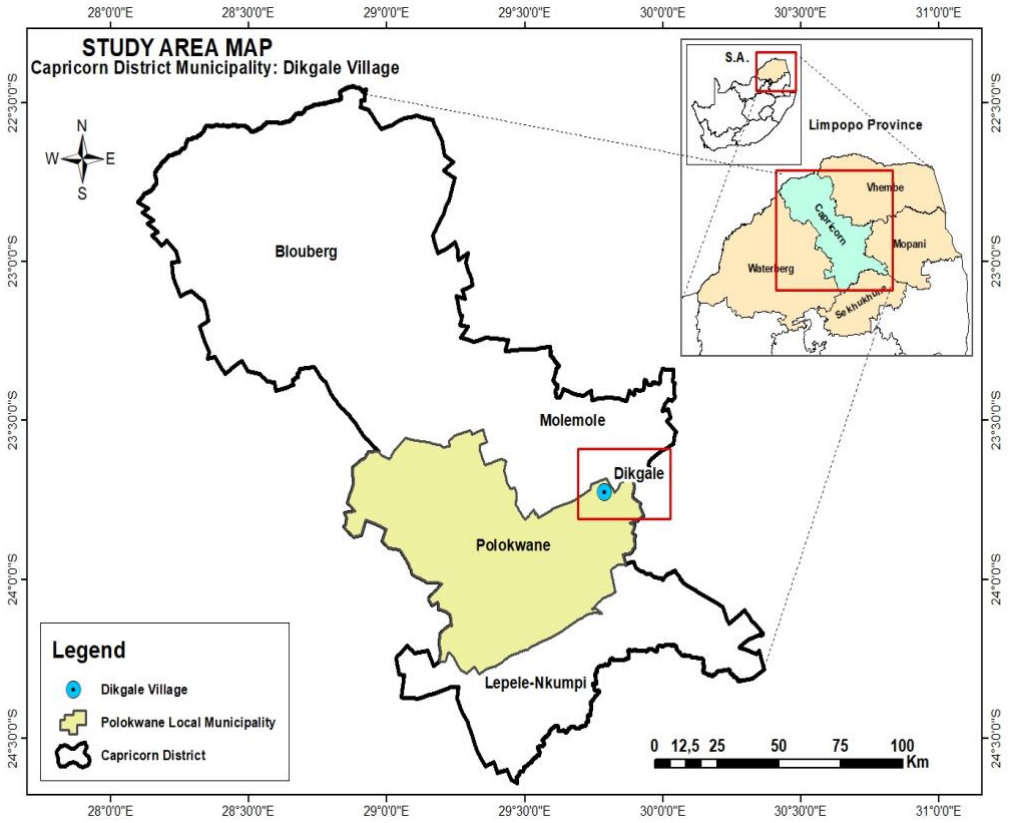

Fig. 1: Map of study area
Source: Author

Fallow fields, irregular water supplies, biodiversity degradation, and chronic drought are signs of climatic change.[21] Because of the inconsistent rainfall patterns, rain-fed crops are generally sown in household gardens rather than ploughing fields. Fewer households raise cattle, goats, and sheep. Livestock-raising is no longer a prevalent activity because it necessitates the purchase of animal feed, which must be obtained from local white farms due to a paucity of fodder in the natural wild. With a population of roughly 45, 083 people and a population density of 116 persons per square km, the village has been around for more than 50 years. Sepedi is the predominant language. The tribal area is a typical rural hamlet, with dwelling units made up of traditional mud huts and modern brick buildings. The community consists of defined dwelling stands with shared grazing space approximately 1 km away and a block of demarcated ploughing fields about 500 meters away from the village site in a more flat and less stony location. Most community members continue to rely on subsistence agriculture as supplementary food sources. A vast amount of biomass is gathered and prepared for daily use. Many indigenous species have the potential to provide food, medicine, and fodder, but they must be abundant and easily available for daily usage, which they are not. Most adult males go to towns, cities, mines, and factories, while some work as agricultural laborers on nearby farms or as general workers at the local hospital, clinics, and the University of Limpopo.[22]

METHODOLOGY

A sample of 150 adults from the Dikgale village was purposefully chosen. To enhance data analysis and interpretation, semi-structured interviews were conducted in Sepedi and translated into English. The interviews took place in a community hall. A questionnaire was utilized to document climate-reliant cultural activities and their status (whether they are currently practiced or not). The collected data revealed common themes such as the types of cultural activities that include the provision of beer (made from locally grown crops) and the offering of meat from slaughtered livestock.

[21] Sejabaledi A Rankoana, "Perceptions of Climate Change and the Potential for Adaptation in a Rural Community in Limpopo Province, South Africa," *Sustainability* 8, no. 8 (2016): 672; Enerst Shingai Chikosi et al., "Climate Change and Variability Perceptions in Ga-Dikgale Community in Limpopo Province, South Africa," *International Journal of Climate Change Strategies and Management* 11, no. 3 (2019): 392–405.
[22] "Polokwane Local Municipality Integrated Development Plan 2022/2023"; "Statistics South Africa Mid-Year Population Statistics. ," http://statistics South Africa.org., 2021.

Table 1 presents information on climate extremes that have resulted in the termination of cultural rituals and celebrations. The study was carried out in an ethical manner to ensure the confidentiality of participants' personal information and collected data, as well as to allow individuals to freely participate in the study. The data's completeness and trustworthiness were determined by reviewing the data with the participants. Corrections to errors, faults, and data gaps were provided by participants. Follow-ups and informal discussions were held to validate and clarify the data.

FINDINGS

Climate Change Threats on Cultural Practices

Table 1: Subsistence agriculture-dependent cultural practices

Variables	Cultural practices	Climate change impact and Sustainability of the cultural practices
Rituals	First fruit rituals: Performed to thank the gods for a good harvest of subsistence crops	Erratic rainfall resulting in intermittent drought and rising temperature impact negatively on the production of subsistence crops prepared and dedicated to the gods and offered to celebrants.
	Rain-making rituals: Performed to request or thank for rainfall	The performance of rain-making rituals requires the slaughtering of livestock, which are currently characterized by poor production as a result of depleted natural feed and water resources because of climate change extremes in the form of rainfall scarcity and rising temperatures.
Cultural festivals	Festivals conducted for entertainment purposes	Locally produced meat and beer would be served for free to celebrants. Erratic rainfall and rising temperature impacted negatively on crop and livestock production. Poor production of crops and livestock hampers the preparation and celebration of festivals.
Bride-price	As per Bapedi culture, payment of the bride price is in the form of cattle	Erratic rainfall and rising temperatures impacted negatively on livestock production. Poor production of cattle has led the people to replace cattle with monetary value.

First-fruit ritual

The ritual was described as an agricultural ceremony. The fruits of the harvest (subsistence crops) were not to be eaten prior to the performance of this rite, according to participants. The event was commemorated in the royal kraal, where samples of planted crops were brought to the kraal, cooked, and served to the celebrants. As per practice, when the crops reach maturity and are ready for consumption, the chief and his advisers decide the date and time to conduct the ritual. The ritual served both religious and nutritional value. Firstly, the ritual was performed to thank the gods for a good harvest, and secondly, it was performed to prevent the community from picking and consuming the crops while they were still immature and of low nutritional value. Due to the present low crop yield, this event is no longer practiced in the community. The negative effects of unpredictable rainfall and increasing temperatures, as well as the accompanying poor crop output, rendered the execution and celebration of the first fruit rite obsolete. The modest and insufficient yield from household gardens could not be celebrated as a community-wide rite.

Rain-making Ritual

The rainmaking ritual was described as a communal ritual officiated by the chief, assisted by his rain doctor, to induce rainfall. Rainmaking rituals were performed to attract rain clouds during drought and when the community received little rain during its season. The purpose of the ritual was to invoke more rainfall that would enable the production of rain-fed crops and livestock for household consumption. The main participants in the ritual were uninitiated girls and boys. Water, sacrificial animals (goats, lambs, and cows), and medicinal herbs were commonly utilized in the production of rain, all of which are today in short supply due to climate extremes

such as rising temperatures, drought, and rainfall shortages. Rain-making rituals are no longer meaningful, according to participants, because many communities have ceased planting subsistence crops and rearing livestock due to continuous rainfall scarcity.

Cultural Entertainments

The entertainment, known as *dinaka, kiba,* or *kosha,* was primarily a dance performed by men or women for recreational purposes. Participants may or may not be related, but they must all live in the same community. Sometimes there were two or more groups of performers, and the competitive element was intended to heighten the enjoyment. These cultural events were held after the agricultural labor was finished, usually in August and September. The performance included flute blowing and drumming. Because they were observed with material goods, the performance of these entertainments merged economic and religious activity. Traditionally, the festivities were marked by the slaughter of livestock and the brewing of beer to be served to the performers and celebrants. The beer was made from sorghum, which was procured from the local harvest. The livestock slaughtered ranged from a goat to a cow, depending on the nature of the event. These entertainments are no longer significant as men and women have began to participate in migratory wage labor as a result of low household agricultural and livestock production.

Bride-Price

It was reported during the interviews the payment of the bride's price by the groom's family to the bride's family was part of the cultural acceptability of marriage. Marriage was not recognized culturally without the payment of a bride price. Commonly known as lobola, the bride's price was paid in the form of cattle. The cattle and goats constitute an integral part of the traditional marriage for ceremonial purposes during and after the marriage ceremony. Due to the unsustainable rearing of cattle because of erratic rainfall impacts on the availability of fodder and water to raise and manage livestock, fewer households raise cattle, which are fed from fodder bought from white farmers. However, the present practice is that the bride's price consists of the cash equivalent of cattle. Bride-price is a monetary payment where one herd of cattle is equivalent to $505 (R10000,00). Interestingly, bride price still bears its traditional nomenclature and is referred to as ***dikgomo*** (cattle).

DISCUSSION

Climate change is an environmental challenge whose negative impacts are being felt in poorer countries, particularly vulnerable indigenous communities. By affecting the environment and natural resources of tribal communities, climate change also threatens the cultural practices of indigenous people. In the present study, climate extremes have negatively impacted the rain-fed production of subsistence crops, which are the basic provisions and requirements for the performance of cultural rituals and celebrations. The same is true for the poor production of livestock, whose remarkable impacts are felt on the fulfilment of marriage requirements. This change in cultural values shows a clear interconnectedness between culture and the natural environment, where culture is shaped by dependency on natural resources such as rainfall. This chain of dependency reflects the mutual dependency of culture and nature, where changes in climatic conditions have negatively impacted human culture. All these pressures and disruptions to cultural practices have largely compromised the cultural heritage of many rural communities whose cultural practices are largely climate-reliant.[23]

An observation from Adger et al. is that climate change impacts cultures and communities negatively, often in ways that people find undesirable and perceive as losses.[24] The members of rural communities are very often confronted with climate variability causing devastating changes in the food supply, water shortages, and natural resource shortages, which automatically impact negatively on cultural values and practices such as celebrations and rituals.[25] When a subsistence economy fails, a community's 'livelihood assets such as social networks, mutual support, values, beliefs, and practices, become vulnerable to shocks.[26]

---

[23] Rohini Prasad Devkota, Geoff Cockfield, and Tek Narayan Maraseni, "Perceived Community-Based Flood Adaptation Strategies under Climate Change in Nepal," *International Journal of Global Warming* 6, no. 1 (2014): 113, https://doi.org/10.1504/IJGW.2014.058758.

[24] W. Neil Adger et al., "Cultural Dimensions of Climate Change Impacts and Adaptation," *Nature Climate Change* 3, no. 2 (February 11, 2013): 112–17, https://doi.org/10.1038/nclimate1666.

[25] Mushore et al., "Climate Change Adaptation and Mitigation Strategies for Small Holder Farmers: A Case of Nyanga District in Zimbabwe."

[26] Climate Change, *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action Outline of Climate Change and Cultural Heritage* (International Council on Monuments and Sites-ICOMOS, 2019).

According to the ICOMOS Climate Change and Cultural Heritage Working Group, as plants and animals used in traditional rites or sacred ceremonies become scarce, tribal culture and ways of life might suffer significantly.[27] Climate stressors' negative impacts on natural resources vital to tribal tradition and culture compound existing stresses such as migrant labor and youth relocation to further undermine culture.[28] Subsistence farming can lead to food insecurity, poverty, and ill health, all of which have a negative impact on rural communities' cultural values.[29] In addition to the observations made above, climate change causes loss and damage to cultural factors such as mobility, displacement, loss of territory, loss of cultural heritage, or loss of local knowledge and language elements, among others.[30]

RECOMMENDATIONS

It is therefore recommended that agricultural extension officers assist small-scale farmers with alternative adaptation interventions to ensure continued production of subsistence crops and livestock to sustain the cultural practices discussed in this study as part of maintaining the rich heritage of the Dikgale community in Limpopo Province.

CONCLUSION

Subsistence crops and livestock production are the bearers of human culture. Festivals, rituals, and entertainments find value in the locally produced crops and livestock. As climate change threatens rain-fed crop and livestock subsistence production, it has an indirect detrimental impact on cultural traditions whose performance is dependent on subsistence production. A major observation from this study is that subsistence production of crops and livestock fosters a creative way for people to connect with their culture and the natural environment. This could serve as the foundation for climate adaptation, resilience, and resistance.

BIBLIOGRAPHY

Adger, W. Neil, Jon Barnett, Katrina Brown, Nadine Marshall, and Karen O'Brien. "Cultural Dimensions of Climate Change Impacts and Adaptation." *Nature Climate Change* 3, no. 2 (February 11, 2013): 112–17. https://doi.org/10.1038/nclimate1666.

Assessment, Millennium Ecosystem. "Cultural and Amenity Services." *Ecosystems and Human Well-Being, Rd Groot and PS Ramakrishnan, Editors*, 2005, 457–75.

Change, Climate. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action Outline of Climate Change and Cultural Heritage*. International Council on Monuments and Sites-ICOMOS, 2019.

Chikosi, Enerst Shingai, Shingirai Stanley Mugambiwa, Happy Mathew Tirivangasi, and Sejabaledi Agnes Rankoana. "Climate Change and Variability Perceptions in Ga-Dikgale Community in Limpopo Province, South Africa." *International Journal of Climate Change Strategies and Management* 11, no. 3 (2019): 392–405.

Devkota, Rohini Prasad, Geoff Cockfield, and Tek Narayan Maraseni. "Perceived Community-Based Flood Adaptation Strategies under Climate Change in Nepal." *International Journal of Global Warming* 6, no. 1 (2014): 113. https://doi.org/10.1504/IJGW.2014.058758.

Fourment, Mercedes, Milka Ferrer, Gérard Barbeau, and Hervé Quénol. "Local Perceptions, Vulnerability and Adaptive Responses to Climate Change and Variability in a Winegrowing Region in Uruguay." *Environmental Management* 66 (2020): 590–99.

Helman, Cecil. *Culture, Health and Illness*. CRC press, 2007.

Hollowed, Anne Babcock, Kirstin Kari Holsman, Alan C. Haynie, Albert J. Hermann, Andre E. Punt, Kerim Aydin, James N. Ianelli, et al. "Integrated Modeling to Evaluate Climate Change Impacts on Coupled Social-Ecological Systems in Alaska." *Frontiers in Marine Science* 6 (January 14, 2020). https://doi.org/10.3389/fmars.2019.00775.

http://statistics South Africa.org. "Statistics South Africa Mid-Year Population Statistics. ," 2021.

[27] Sisay Workalemahu and Ibsa Dawid, "Smallholder Farmers' Adaptation Strategies, Opportunities and Challenges to Climate Change: A Review," *International Journal of Food Science and Agriculture* 5, no. 4 (October 20, 2021): 592–600, https://doi.org/10.26855/ijfsa.2021.12.005.

[28] Happy M Tirivangasi, Shaun N Makwala, and Sejabaledi A Rankoana, "Public Perceptions of Climate Change: A Rural Case Study of Motupa Community in Limpopo Province, South Africa," n.d.; T Straza, S Lui, and B Burfitt, "Effects of Climate Change on Society, Culture and Gender Relevant to the Pacific Islands," *Pacific Marine Climate Change Report Card: Science Review*, 2018, 201–10.

[29] Devkota, Cockfield, and Maraseni, "Perceived Community-Based Flood Adaptation Strategies under Climate Change in Nepal."

[30] Pearson, Jackson, and McNamara, "Climate-Driven Losses to Knowledge Systems and Cultural Heritage: A Literature Review Exploring the Impacts on Indigenous and Local Cultures"; Adger et al., "Cultural Dimensions of Climate Change Impacts and Adaptation"; Straza, Lui, and Burfitt, "Effects of Climate Change on Society, Culture and Gender Relevant to the Pacific Islands."

https://www.polokwane.gov.za/SPX News Article. “ Polokwane Local Municipality Integrated Development Plan 2022/2023,” 2022.

Intergovernmental Panel on Climate Change (IPCC). “Summary for Policymakers.” In *The Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. New York: Cambridge University Press, 2013.

IWGIA News. “International Work Group for Indigenous Affairs. International Year of Indigenous Languages, .” https://www. iwgia.org/en/news/3302-year-of-indigenous-languages.html., January 2019.

Massey, Justine Marrion. *Climate Change, Culture and Cultural Rights*. UN, 2020. https://www.ohchr.org/sites/default/files/Documents/Issues/CulturalRights/Call_ClimateChange/JMassey.pdf.

Mushore, Terence Darlington, Teddious Mhizha, Moven Manjowe, Linia Mashawi, Electdom Matandirotya, Emmanuel Mashonjowa, Collen Mutasa, Juliet Gwenzi, and George Tawanda Mushambi. “Climate Change Adaptation and Mitigation Strategies for Small Holder Farmers: A Case of Nyanga District in Zimbabwe.” *Frontiers in Climate* 3 (August 6, 2021). https://doi.org/10.3389/fclim.2021.676495.

Orr, Scott Allan, Jenny Richards, and Sandra Fatorić. “Climate Change and Cultural Heritage: A Systematic Literature Review (2016–2020).” *The Historic Environment: Policy & Practice* 12, no. 3–4 (October 2, 2021): 434–77. https://doi.org/10.1080/17567505.2021.1957264.

Pearson, Jasmine, Guy Jackson, and Karen E McNamara. “Climate-Driven Losses to Knowledge Systems and Cultural Heritage: A Literature Review Exploring the Impacts on Indigenous and Local Cultures.” *The Anthropocene Review* 10, no. 2 (August 15, 2023): 343–66. https://doi.org/10.1177/20530196211005482.

Rankoana, Sejabaledi A. “Perceptions of Climate Change and the Potential for Adaptation in a Rural Community in Limpopo Province, South Africa.” *Sustainability* 8, no. 8 (2016): 672.

Schramm, Paul J, Angelica L Al Janabi, Larry W Campbell, Jamie L Donatuto, and Shasta C Gaughen. “How Indigenous Communities Are Adapting To Climate Change: Insights From The Climate-Ready Tribes Initiative: Analysis Examines How Indigenous Communities Are Adapting to Climate Change.” *Health Affairs* 39, no. 12 (2020): 2153–59.

Smith, Jordan W., Dorothy H. Anderson, and Roger L. Moore. “Social Capital, Place Meanings, and Perceived Resilience to Climate Change*.” *Rural Sociology* 77, no. 3 (September 20, 2012): 380–407. https://doi.org/10.1111/j.1549-0831.2012.00082.x.

Straza, T, S Lui, and B Burfitt. “Effects of Climate Change on Society, Culture and Gender Relevant to the Pacific Islands.” *Pacific Marine Climate Change Report Card: Science Review*, 2018, 201–10.

Tirivangasi, Happy M, Shaun N Makwala, and Sejabaledi A Rankoana. “Public Perceptions of Climate Change: A Rural Case Study of Motupa Community in Limpopo Province, South Africa,” n.d.

Wit, Sara de, and Sophie Haines. “Climate Change Reception Studies in Anthropology.” *WIREs Climate Change* 13, no. 1 (January 14, 2022). https://doi.org/10.1002/wcc.742.

Workalemahu, Sisay, and Ibsa Dawid. “Smallholder Farmers’ Adaptation Strategies, Opportunities and Challenges to Climate Change: A Review.” *International Journal of Food Science and Agriculture* 5, no. 4 (October 20, 2021): 592–600. https://doi.org/10.26855/ijfsa.2021.12.005.

ABOUT AUTHOR

Professor Sejabaledi Agnes Rankoana is an established researcher in the field of medical anthropology with special focus on medical ethnobotany, food security and climate change.