



INDIGENOUS KNOWLEDGE AND SUSTAINABLE DEVELOPMENT



Editors:
Tom Kwanya, Peter Matu

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The Technical University of Kenya • Nairobi, Kenya

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25. Indigenous Rainmaking Practices and Their Impact on Climate Change in Western Kenya

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Abstract

This paper aims to explore the indigenous rainmaking practices in Western Kenya. The specific objectives of the paper are to analyse the prevalence, evidence, seriousness, and effects of climate change in Western Kenya; the local community's response to the effects of climate change in Western Kenya; how the indigenous rainmaking practices can be used to mitigate the consequences of climate change; and strategies which can be used to mainstream indigenous rainmaking practices in building climate change resilience in line with the Sustainable Development Goals (SDGs), Vision 2030 and the "Big 4" Agenda in Kenya. The study used a qualitative research approach. Data was collected using interviews with indigenous rainmakers and scientific weather experts in Western Kenya. Data was analysed qualitatively using ATLAS.ti. The study revealed that the climate of Western Kenya has drastically changed. This has affected the rainy seasons. The locals have responded by planting drought-resistant crops that can withstand the changes and planting trees to boost rainfall. Indigenous rainmaking practices such as making rain, preventing rain, and predicting rain are used by rainmakers to enhance climate change adaptation and mitigation in the region. It is evident from the findings that traditional rainmaking practices can contribute to food security, improved manufacturing by providing raw materials, healthy livelihoods, social security, and increased employment through sustainable agriculture. To maximise this potential, there is a need to mainstream traditional rainmaking practices in the national response to climate change through documenting, popularising and validating the practice.

Keywords: *Indigenous knowledge, traditional ecological knowledge, Nganyi clan, global warming, traditions*

1 Introduction

Climate is the average atmospheric conditions observed over an extended timeframe (Brazzola et al., 2022). Weather, on the other hand, can be defined as the atmospheric conditions of an area in a shorter duration, like one month (Iyakaremye et al., 2022). These atmospheric conditions include sunshine, rain, wind, cloud cover, flooding, hailstorms, and thunderstorms, which can change hourly, daily or seasonally. The climate and its changes can determine the weather of a region. Weather is the state of the atmosphere in a particular place and at a specific time, and climate is the prevailing condition of the atmosphere deduced from long periods of observation. Despite the distinction between the two concepts, climate and weather are interrelated (Finney et al., 2020). Changes in them affect human activities either positively or negatively. Climate change is an occurrence that is directly or indirectly associated with human activities, which reorients the composition of the global atmosphere in addition to natural climate inconsistency observed over comparable periods (Lovejoy, 2013). Climate change is further described as any alteration in atmospheric conditions over time due to natural variability or human activity (Kummu et al., 2021). The crisis caused by climate change has proven to be an environmental and human hazard

that partially undermines the attainment of Sustainable Development Goals (SDGs) targets on zero hunger and the efforts of the international community to reduce extreme poverty (Chepchirchir et al., 2018). Climate change predominantly affects developing countries due to their vulnerability to extremes of normal climatic variability (Kwanya, 2014).

The ability of indigenous communities to respond to climate change using traditional ecological knowledge (TEK) has been the subject of many studies (Sillitoe, 2007). Through these studies, indigenous knowledge has been confirmed as possessing the potential to assist communities in adapting to and mitigating climate change (Kwanya, 2014). However, combining it with modern weather science was of concern, especially at the policy and planning level. Integrating IK in climate policy would facilitate effective mitigation and adaptation development programmes that are cost-effective, participatory and sustainable (McGregor, 2021). Although the Government of Kenya, through its National Climate Change Response Strategy (NCCRS), which was developed in 2012, recognised the potential role of indigenous knowledge in bolstering the national response to climate change, the extent to which this potential has been harnessed is unclear. IK generally remains on the fringes of Kenya's decision-making processes. Therefore, its potential value in local-level decision-making in agriculture, healthcare, food preparation, education, natural resource management and other activities is hardly exploited (Chepchirchir et al., 2018; Kwanya, 2015).

2 Context and background of the study

This paper focuses on the experience of the Nganyi, a rainmaking clan in Kenya. The Nganyi are a sub-clan of Abasiakwe who belong to the Banyore clan of the Abaluhya tribe in Kenya. Their traditional home is in Vihiga County of Western Kenya. According to Ottichilo (2016), the Banyore are descendants of Marimba. Muhimba, the son of Marimba, became the father of Anyole, who was said to have been killed in a war. Onyango (2019) explains that Anyole's widow bore a son named Anyole II. The Nganyi community are descendants of Anyole II. They settled in Ebusiekwe, a dry, hilly area with flora and fauna conducive to their IK. The clan is best known for the indigenous knowledge practice of traditional rainmaking (Ottichilo, 2016). Even though narratives have confirmed that their skills in rainmaking originated from a woman, the more prominent clan disregarded women in the rainmaking practice.

Ottichilo (2016) narrated how rainmaking was a source of dignity and desecration to Nganyi in 1919. The extended drought that year was blamed on Etemesi and Nganyi, members of the clan, who were arrested and taken to Kodiaga Prison in Kisumu by colonial rulers. There, they were forced to make rain. They obliged and made rain outside the shrines. This was against the Abanyore tradition, which stipulated that rainmaking activities should be performed only at the official rainmaking shrine in the Lela area. As a result of this grave cultural mistake, it is believed that the two rainmakers died mysteriously. Ottichilo (2016) stated that rain prediction among rainmakers was made through observation of natural phenomena by traditional older men. Conditions of the atmosphere were the indicators primarily relied upon to predict rain. A few selected elders performed the other mechanism for rainfall prediction through divination, visions and dreams. The rainmakers derived their forecasts by observing the behaviour of plants, animals and stars.

Many other communities in Kenya practice traditional rainmaking. These include the Akamba, Maasai, Meru and Kikuyu. However, the Nganyi's practice is the most documented (Kwanya, 2014). There are efforts to validate the practice by partnering traditional rainmakers with regional scientific meteorologists. Researchers from Maseno University and the University of

Nairobi, as well as a team from the IGAD Climate Prediction and Application Centre, have also been trying to validate the practice (Gumo, 2017; Guto, 2020).

3 Research problem statement

The consequences of climate change are far diverse, biting through man and the environment equally. For instance, forest cover plays a role in determining the climate pattern vital for animal, plant and human growth. However, out of the selfish desires of humans to expand territory, the activities to create solutions to problems such as settlement and industrialisation are becoming more hazardous than previously thought (Lecina-Diaz et al., 2021). The Government of Kenya and other stakeholders have tried many options to deal with climate change, but these efforts have borne minimal results (Kwanya & Kiplang'at, 2016). In the past, indigenous knowledge in the context of traditional rainmaking was used to counter cruel climatic occurrences. For example, during cultural ceremonies such as weddings, naming of children, and burials, a rainmaker would perform miraculous chants to forbid rain (Akong'a, 1987). Currently, the indigenous knowledge of traditional rainmaking among the Nganyi clan in Western Kenya is not being used optimally to contribute to the Government's and other stakeholders' efforts to respond to the effects of climate change (Guto, 2020).

The situation is exacerbated by the fact that the custodians of the traditional rainmaking knowledge, just like the other indigenous knowledge, are the community elders who are rapidly decreasing (Akong'a, 1987). The younger generation is less interested in the traditional rainmaking knowledge, often referring to it as a myth. Additionally, the spread of Western social structures and institutionalised forms of cultural transmission has restricted the indigenous views of the world and approaches to education (Kwanya, 2020). Consequently, essential aspects of indigenous knowledge, such as the flowering pattern of trees and the position of the moon, stars and sun, have yet to be formally documented anywhere (Masinde, 2015). Scholars (Ratima, 2019; Reyes-García & Fernández-Llamazares, 2019) have explained that the so-called civilisation was proving to be a threat to the practices of indigenous people. Therefore, the traditional rainmaking practice of the Nganyi clan is in danger of getting lost. This is because it is tacit knowledge which is contained in the brains of the clan elders. Therefore, there was a need for a conversation on how to mainstream traditional rainmaking in confronting climate change in Kenya, hence this study. The specific objectives of the study were to investigate the prevalence, evidence, seriousness and effects of climate change in Western Kenya; analyse the local community's response to the effects of climate change in Western Kenya; analyse how the traditional rainmaking practices can be used to confront the consequences of climate change in Western Kenya; and explore strategies which can be used to mainstream traditional rainmaking in building climate change resilience in line with the Sustainable Development Goals (SDGs), Vision 2030 and the "Big 4 Agenda" in Kenya.

4 Literature review

Africa is experiencing severe climatic challenges that have resulted in disasters such as the destruction of roads, houses and farms. The resultant scarcity of rainfall has also led to famine and food insecurity, negatively affecting livelihoods, especially for poor households. Climate change has also led to very high temperatures, high levels of rainfall and high frequency of floods. High heat levels also affect the distribution of disease vectors, which are forced to migrate or move to areas of higher altitudes. For instance, migrating mosquitoes to higher altitudes exposes a larger population of the local communities in the densely populated East

African highlands to infections such as highland malaria (Ototo et al., 2022; Schindler et al., 2018). The other consequences of climate change in Kenya include increased cases of mental illnesses as a result of psychological trauma (Njeru et al., 2022), increased animal diseases leading to low production levels (Kimani, 2022); reduced hydro-electricity production triggering high energy costs (Pappis et al., 2022); low crop production (Ngure et al., 2021) and conflicts over diminishing natural resources (Ngaruiya & Scheffran, 2016).

The local communities across the region are responding to climate change by managing the dangers that global warming brings to their lives. The vulnerability of developing countries to climate change needs to be reduced by adapting the capacity raised to implement national adaptation plans (Sherman et al., 2016). Otherwise, the community risks graver consequences in terms of health, food security, physical comfort, flooding, mudslides, soil erosion and resource conflicts (Raburu et al., 2012; Simane et al., 2016). The frequency and severity of climate change hazards are rising globally, and the effects are seriously felt in local communities. It is, therefore, uncertain or not easy to enhance the understanding of the available response options selected by the communities (Thornton et al., 2014). Local communities are reporting the consequences of climate variations in their areas and responding to the new conditions as best as possible using solutions specific to the locality (McIver et al., 2016). Some of the measures to reduce the adverse effects of climate change include increased sea defences, coming up with houses or homes on stilts that are flood-proof, reducing the amount of water used during periods of drought, and using insecticide-sprayed mosquito nets (Adedeji, 2014).

According to Shilenje and Ogwang (2015), early warning in weather forecasting provides practical and timely weather information that enables communities, organisations and individuals exposed to likely weather hazards to act. Despite the application of meteorological scientific intervention, some African communities still practise the traditional knowledge of making rain (Enock, 2013). Traditional knowledge characterising rainmaking can offer a valuable understanding of environmental changes, complementing broader-scale scientific research with local precision and variation (Ombati, 2017).

It is evident that climate change is real and continues to have severe and diverse effects on communities. It is also clear that communities in developing countries bear the most significant burden of the consequences of climate change. Therefore, they are more vulnerable to the consequences than the rest. Several strategies have been employed to enhance the capacity to mitigate or adapt to climate change. However, literature on the potential or actual application of indigenous knowledge, specifically traditional rainmaking, to bolster efforts to confront climate change in local communities in Kenya is inadequate. This gap motivated this study.

5 Research methodology

This study employed a qualitative research approach because it enabled a limited number of cases to be studied in-depth. Additionally, the researchers could understand the rainmakers' personal experiences with traditional rainmaking. Scholars (Lewis, 2015; Maxwell, 2012; Roller & Lavrakas, 2015) perceive qualitative research designs to include narrative, phenomenology, grounded theory, action research, case study, ethnography, historical research, and content analysis. This study used a case study design because it enabled the researchers to explore the issues in-depth. Case studies use open-ended questions through which interviewees freely share their experiences (Gammelgaard, 2017). The population of this study comprised rainmakers from the Nganyi clan and expert weather forecasters from the Kenya Meteorological Department (KMD). The researchers identified the respondents using a non-probability sampling approach.

Specifically, snowball sampling was used to identify the rainmakers while all the scientists based at the Vihiga Meteorological Department office were selected. The collected data was analysed using ATLAS.ti, a qualitative data analysis (QDA) package (Rooney et al., 2016).

6 Findings of the study

As indicated earlier, the researchers used the snowballing method to identify the respondents from the rainmakers. A saturation point was reached at 37 rainmakers. The participating rainmakers estimated that about 50 rainmakers were in the Nganyi clan. Therefore, the response rate translates to 74 per cent. Of the 37 rainmakers interviewed, only 12 of them shared their age. The youngest respondent among the rainmakers was 65, while the oldest respondent was 85. The majority, 7 (19%) of the respondents, have been involved in rainmaking for at least 30 years, followed by 20 years at 11%. Those who had 50 years' experience were 8%.

Additionally, 5% of the respondents had experience spanning 10, 15, and 25 years. The researchers sought more information about the respondent, who was 85 years of age and had 70 years of experience, implying that the respondent had started rainmaking at 15. It emerged that the respondent used to assist his grandfather and father in collecting the herbs and mixing them for rainmaking. Thus, he was inducted into rainmaking at a tender age. The researchers sought to know the clans of the rainmakers. It was established that all 37 respondents were from the Nganyi clan. It also emerged that most of the respondents inherited rainmaking skills from their fathers. Others said they inherited the skills from their grandfathers, while the rest said it was inborn. Generally, the practice was inherited from ancestors.

6.1 Nature and effects of climate change

The study sought to know the nature of climate change in Western Kenya, as observed by the KMD respondents. It was established that there has been a change in the climate of the region over the years. Some of the responses recorded included:

"The climate has changed drastically over time due to the changes in the atmosphere in the region."
[Respondent 1]

"There has been a drastic change in the region's climate, and I can attribute this to global warming. This has, in turn, affected the rainy seasons." [Respondent 11]

"There has been an evident change in the rainfall patterns. The rains come earlier than expected or sometimes very late." [Respondent 15]

"There has been a change in the weather patterns, and I can attribute this to pollution, the cutting of trees, and the rise of industries that affect the rain seasons." [Respondent 33]

When asked about the effects of climate change in the region, the respondents from the KMD cited unpredictable farming seasons, negative impact on rainfall patterns, recurrent droughts in the region, low crop yields, delays in planting, increased cost of living, and lack of food for the animals. The following are some of the responses from the respondents:

"Effects of climate change include delay in land preparation and planting change of season, and drought cause animals and humans not to have food; cost of living also goes high." [Respondent 21]

"Droughts come unexpectedly affecting livestock and farmers as they are unable to plant their crops; low yields due to lack of rain; as well as a negative effect on their lifestyle." [Respondent 37]

On their part, the rainmakers summed up the effects of climate change in the following selected verbatim statements:

"Lack of rains leads to starvation due to drought in the land." [Respondent 6]

“When the rains do not come, there is starvation, diseases, hunger, and sometimes we even have deaths associated with the same.” [Respondent 15]

“We have experienced many droughts due to the effects of climate change over the years.” [Respondent 23]

“Food shortage has been a major effect of climate change in this area. We used to have much food, but nowadays, we hardly have enough for ourselves.” [Respondent 37]

6.2 Local community’s response to climate change

The researchers sought to establish the local community’s response to the problem of climate change. Some of the responses included planting drought-resistant crops that can withstand the changes, planting trees to attract rainfall, and relying on the KMD weather reports. Some of the responses given included:

“The community is relying on the KMD weather reports to plan their activities.” [Respondent 10]

“The community is slowly accepting the negative changes in climate, which have affected the productivity of crops.” [Respondent 21]

“Communities are responding by planting trees to cope with the changing climate.” [Respondent 22]

“Planting of trees has helped in dealing with the adverse effects of climate change but has not completely solved the issue of climate change” [Respondent 27]

The respondents were asked about the effectiveness of these responses employed by the locals to counter climate change. Among the responses noted from the respondents included:

“Climate change is so unpredictable, and it is hard to tell whether the locals are doing the right thing, thus making it hard to predict effectiveness.” [Respondent 3]

“Sometimes we respond in a certain way, but things turn out differently, for example, preparing the land in anticipation of the rains only to realise the rains are not here yet. This renders the efforts ineffective.” [Respondent 7]

“People are buying food in bulk in anticipation of a shortage. Purchasing during plenty so that it can be used during drought is effective and normally goes a long way in helping the community to have enough food.” [Respondent 37]

6.3 Traditional rainmaking practices among the Nganyi clan in Kenya

The findings revealed that the Nganyi could predict, stop or make rain. The respondents explained that predicting rain involves using plants, insects, and animals, which are complemented by observation. The following are some of the respondents’ responses about how they predicted rain:

“Observation of plants, insects, the behaviour of birds, trees, checking if the water in the pot at the shrine is hot or cold.” [Respondent 3]

“Miracle from God to Nganyi clan. When rains come with too much wind, black rain, or hailstorm, they pray to God at the shrine to help them control the rain the way their forefathers taught them.” [Respondent 37]

“Using reptiles such as frogs, special plants, insects such as safari ants, movement of wind, cloud observation and moon appearance.” [Respondent 17]

“Observation of trees shedding leaves, the croaking of frogs, movement of wind, clouds in the sky, behaviour of birds.” [Respondent 29]

“Observation of insects, moon, the behaviour of animals, birds, morning dew, movement of the wind.” [Respondent 7]

The researchers sought to establish from the rainmaker respondents whether the government is aware of their rainmaking practices and the possibility of using them to benefit the larger community by involving the government. All 37 respondents indicated that the government is aware of the rainmaking activities in the area. The respondents were probed further on how and why the government became aware of the activities. Multiple or different responses were recorded and are represented by the following verbatim statement:

“Through the KMD in 2009, researchers from IGAD, Prof. Mary Anyango & Patricia, Prof. Ouma & the late Prof. Ogallo Laban visited the shrine.” [Respondent 1]

“Mzee Kenyatta [Kenya’s founding president] invited elders to Nairobi to make rain during a drought.” [Respondent 12]

“During the colonial era, Nganyi was arrested by the colonialists. He was first arrested in 1916 and again in 1919 when he was severely tortured and taken to Kodiaga Prison. Upon his arrest, there was heavy rainfall in the area. Before his arrest, it was believed that he used to send people to make rain in Bondo, Homa Bay, and Kakamega, and that is why the colonialists mistreated him.” [Respondent 37]

6.4 Mainstreaming traditional rainmaking practices in building climate change resilience

The researchers inquired how traditional rainmaking can be mainstreamed to build climate change resilience in Kenya to enhance the country’s capacity to attain Sustainable Development Goals, Kenya Vision 2030 and the “Big 4 Agenda”. The following are some of the recorded responses:

“By setting up common objectives for Kenya Vision 2030 and the ‘Big 4 Agenda’, and to protect and manage climate change, the government should protect all forests in Kenya and plant millions of indigenous trees in Western Kenya.” [Respondent 38]

“By strengthening the collaboration between KMD and traditional rainmakers to set common goals and empower the traditional rainmakers by conserving the shrines and planting indigenous trees.” [Respondent 39]

“Strategies include joint workshops and seminars between Nganyi rainmakers and KMD to exchange ideas.” [Respondent 42]

7 Discussion of the findings

It is evident from the study findings that climate change is real in Kenya and has created immense concerns for the citizens and the government. In Western Kenya, climate change has affected rainfall patterns; rain now falls either earlier or later than expected. Thus, there is more rain in January when the locals have not prepared the farms and more again during harvest time when they want the maize to dry in the fields. The rain then disappears immediately when the farmers plant the crops. This results in massive losses because, without rain, the planted seeds do not germinate, but they either rot or shrivel. During harvest time, rain is not required because the crops need sunlight to dry. Thus, the unpredictable rainfall affects crop production, resulting in food insecurity. These findings echoed Masinde and Bagula (2011), who explained that changes in rainfall patterns have greatly affected agriculture in Western Kenya. The changes have also led to the disappearance of primary forests due to uncontrolled logging, farming, and oil exploration and exploitation. The current study has established that the situation has not improved because the population is growing larger and the land is small. Human activities to cope with population pressure further exacerbate the situation.

This study also revealed that the local community has responded to the consequences of climate change by planting drought-resistant crops that can withstand the changes, planting

trees to improve rainfall, and relying on the KMD's weather reports to get information on weather changes. The study further established that even though planting trees and drought-resistant crops has assisted the community in coping with the adverse effects of climate change, it has not completely eradicated the challenges. The frequency and severity of the hazards emanating from climate change are increasingly rising. Therefore, there is a need for more strategies to cope with or reduce the consequences of climate change. Given the variability of the consequences of climate change, Thornton et al. (2014) suggested localised interventions specific to local contexts. This is where indigenous knowledge, such as traditional rainmaking practices, comes in handy. Indeed, the American Association for the Advancement of Science (2019) suggested that governments, businesses, community members, scientists, and non-profits should utilise local knowledge to respond to climate change. According to Shilenje and Ogwang (2015), traditional rainmaking knowledge can be used to issue early warnings of changes in weather patterns, thereby strengthening the community's capacity to respond appropriately to the consequences of the change and avoid associated losses.

Traditional rainmakers and weather forecasters from the KMD can collaborate and utilise their collective knowledge to understand and predict weather patterns, make rain when needed, and stop it when it is unnecessary. Similarly, traditional environmental conservation practices such as sanctions on cutting down indigenous trees can be scaled up to improve the forest cover and reduce the pace of climate change. To maximise the potential of traditional rainmaking practice, there is a need to document and popularise the practice. This can be done through public awareness campaigns via the mass media such as Anyole Radio, publications, and meeting forums such as weddings and funerals. Such campaigns will help to demystify and popularise traditional rainmaking practices in the community. These suggestions echo Ifejika Speranza et al. (2010), who argued that creating awareness is essential regarding rainmaking, as the case has been in countries such as Zimbabwe, where communities appreciate traditional rainmakers.

8 Conclusion

The study established that climate change is as real in Western Kenya as it is in the rest of the world. However, its consequences are more severe in the Global South due to resource constraints that prevent it from being mitigated or adapted to. In Western Kenya, the consequences have mainly been evidenced by unpredictable rainfall patterns, which have affected agriculture and food production. The study also revealed that the local community is responding to climate change by planting drought-resistant crops that can withstand harsh climatic conditions, building dykes both to harvest rainwater and prevent soil erosion, and planting trees to enhance rainfall in the region. However, these efforts have not been entirely successful. Vulnerability to the effects of climate change persists. Traditional rainmaking practices of predicting, making or stopping rain can strengthen the community's capacity to confront the consequences of climate change. This will contribute to better food security, health, industrialisation and livelihoods, which are developmental targets captured in the SDGs and Vision 2030 and Kenya's "Big 4" agenda. These benefits can be maximised by mainstreaming traditional rainmaking in the country's response to climate change.

9 Recommendations

The study recommends strengthening the community's response to climate change by mainstreaming traditional rainmaking.

- The government should appreciate indigenous knowledge and motivate traditional rainmakers for their efforts in rainmaking. The government, particularly at the county

level, should recognise the practice and seek strategies to motivate them to contribute actively to the national climate change response.

- The government should encourage traditional rainmakers and KMD experts to collaborate to enrich weather forecasting and enhance its reliability. This can be achieved through collaborative projects. Relevant policy and legal frameworks facilitating this collaboration should be explored and pursued.
- Through the Ministry of Environment, the government should collaborate with the rainmakers to increase the preservation of natural ecosystems and conserve the environment. Recognising that traditional rainmakers prohibit the cutting of indigenous trees, the Ministry should maximise this to promote tree planting and reforestation.
- The government should sensitise traditional rainmakers to how they can contribute to realising short—and long-term development blueprints such as the “Big 4 Agenda” and Vision 2030. They can also be educated on the critical targets of these blueprints, which are relevant to or depend on their practice.
- The government should recognise and enlist the traditional rainmakers as community champions of information-based agriculture planning. This would include the use of accurate weather forecasts as well as planting drought-resistant crops and raising appropriate animal breeds.

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