Original Research Article

MAINSTREAMING INDIGENOUSKNOWLEDGE INTO CLIMATE CHANGE POLICIES IN CAMEROON

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Abstract

Indigenous pastoralists are hardest hit by the impacts of climate change because of their dependence on nature and limited adaptation. This paper seeks to examine the level of integration of traditional knowledge systems into adaptation policies in Cameroon, using the specific case of Mbororo pastoralists. Using a mainly qualitative approach in data collection, in-depth interviews were conducted with 28 purposively selected pastoralists from 4 divisions with intense pastoral activity, comprising 19 Mbororo pastoralists, 2 members of the Mbororo Social and Cultural Association (MBOSCUDA), 2 Mbororo traditional rulers, 5 Mbororo women and one focus group discussion. Discussions were recorded and voice notes were transcribed, coded and treated according to content and thematic with the aid of Atlas. Ti software. Results show that Mbororo pastoralists migrated into the region in the 1950s as nomadic herders and occupied marginal lands due to the nature of their activity. With climatic aberrations being acute, their closeness to nature permitted them to develop a wide array of knowledge and traditional practices to adapt and exploit existing opportunities. Semi-nomadic and transhumance methods of rearing, cross-breeding local species with high-breed species to produce resistant breeds of cattle, cultivating resistant pasture species, rotational grazing and using traditional medicines to treat cattle diseases have reduced resource degradation and curbed the effects of climatic aberrations. Nevertheless, these indigenous knowledge systems are eroding fast due to poor indigenous institutions and non-integration into policy. The mainstreaming of traditional knowledge systems is necessary for proper adaptation.

Keywords: *Indigenous knowledge, Climate change, adaptation policy, pastoralists, North West region, Cameroon*

1. INTRODUCTION

Climate variability and change are some of the most pressing environmental challenges plaguing mankind today. The effects are felt differently across the globe and activity sectors but in developing countries, indigenous people are hardest hit due to their inextricable link with nature and fewer coping options [1]. Indigenous Peoples refer to socio-cultural groups that have collective ancestral ties to the natural environment where they live or from which they have been displaced. Their natural environment and resources on which they depend are inextricably linked to their identities, livelihoods, and cultural and spiritual well-being [2,3]. Their interactions with nature have permitted them to acquire and accumulate a body of know-how and knowledge systems which is transferred from one generation to another [4]. These indigenous knowledge systems are not only useful in the observation and interpretation of weather patterns [5], but most importantly in climate change adaptation.

While Indigenous Peoples own, occupy, or use a quarter of the world's surface area, they safeguard 80 per cent of the world's remaining biodiversity [2]. They hold vital ancestral knowledge and expertise on how to adapt, mitigate, and reduce climate and disaster risks [6,2]. Indigenous knowledge is considered a set of know-how, practices and beliefs that are evolving through an adaptive process and in response to environmental and climate changes. Though it is time, place and culture-specific [7], this body of knowledge can be documented and transmitted within a community and between communities.

Indigenous pastoralists occupy marginal lands and mountain areas. In Sub-Saharan Africa, dry lands make up 60% of the total land area and host more than 110 million agro-pastoralists [8]. They live in arid and semi-arid zones which are inaccessible with less modern facilities, making them highly vulnerable to the effects of climatic aberrations. As such, they rely on traditional knowledge systems to secure pastures for their livestock [9]. The integration of Indigenous Knowledge and its association with modern scientific knowledge is indispensable in climate change adaptation and in ensuring sustainable livelihoods [10]. The implementation of a National Adaptation Strategy and the achievement of SDG require tailored interventions in pastoral areas.

This work takes the case of Mbororo pastoralists in the North West Region of Cameroon to x-ray their knowledge systems and the extent to which they are integrated into policies at the local level. Extant scholarly literature has shown that Mbororo Pastoralists have a large array of traditional practices and indigenous knowledge which they acquired from their constant interactions in their environment and empirical notions developed due to their relentless attempts to improve their quality of life [11]. The diversified use of landscapes, mobility as well as the diversification of livelihood sources strengthens the capacity of pastoralists to respond to environmental changes triggered by climate change and other stressors[4,5].

However, the role of tribal people and their knowledge systems have not yet been given considerable attention. Indigenous People have an important role to play in the realization of sustainable development goals and the implementation of the NDS in the year 2030 not only because they preserve nature but also because they contribute significantly to the fight against climate change. Their traditional knowledge systems cut across many aspects of sustainability ranging from predicting weather changes to enhancement of sustainable practices in crop and animal production. Nevertheless, these knowledge systems have not been properly streamlined into development policies and climate adaptation strategies. It is based on this back drop that this study seeks to investigate the level of integration of Indigenous knowledge into climate change policies in Cameroon.

1.1. **Indigenous People of Cameroon**

Cameroon has a cultural diversity with more than 250 ethnic groups dispersed all over the country. The International LabourOrganization[12] revealed that Indigenous People make up about 10% of the total population and they are divided into two main groups; the forest People known as the “Pygmies” and the Mbororos. The Pygmies are found in the forest areas of the South East and Central regions while Mbororos are pastoral nomads who live mostly in the Savannah areas (Figure 1). According to the International Work Group for Indigenous Affairs, IWGIA, [13], the Mbororos make up 12% of this population and are made of three sub groups; the Aku, the Woobade and the Jafun, all belonging to a large group called the Fulani. The forest people on the other hand are made up of the Baka, Badyeli and the Bedzan. The forest people are mainly involved in hunting and gathering of forest resources while Mbororos have cattle rearing as their main activity.

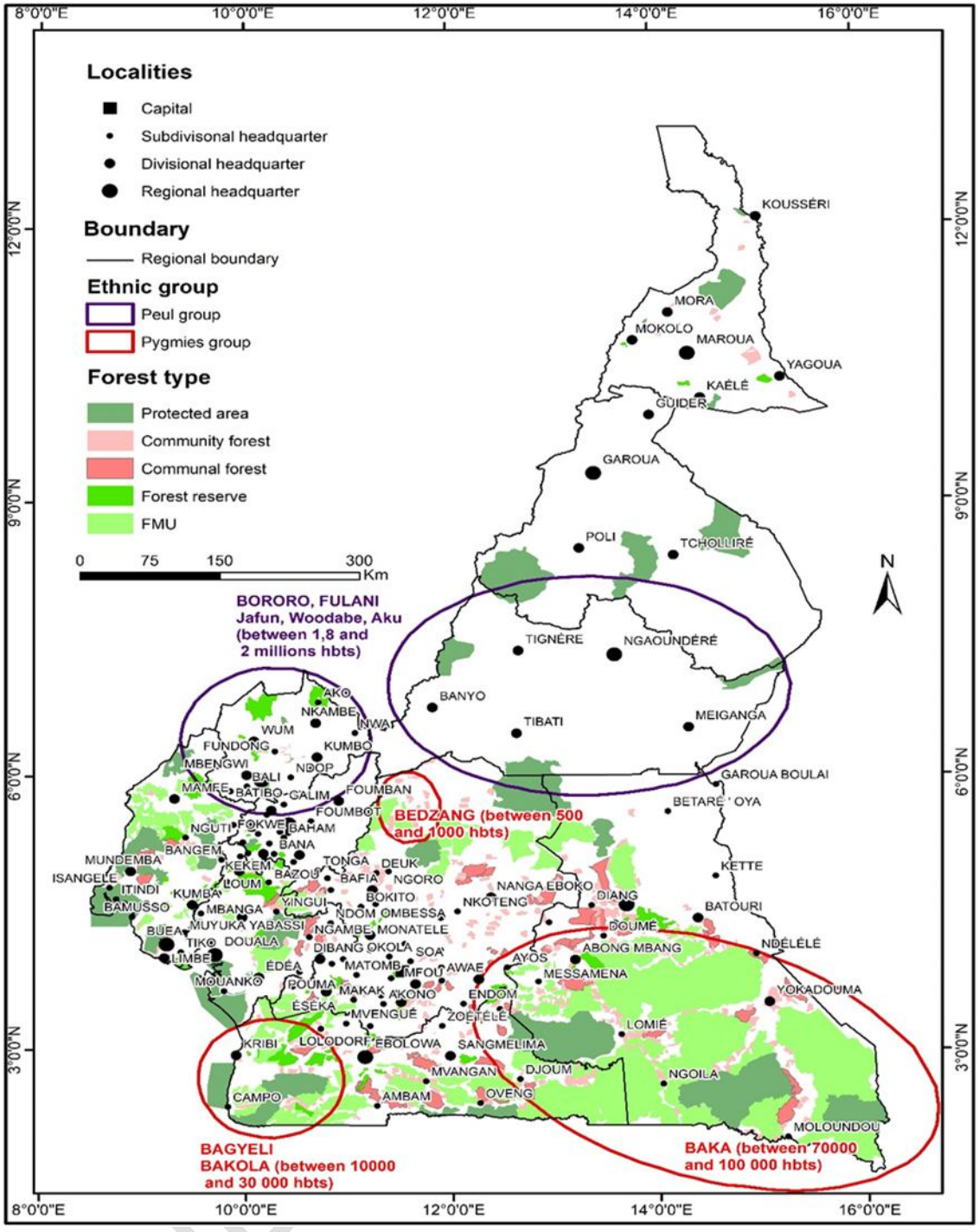

Figure 1: Location of the Indigenous People of Cameroon

Source: IWGIA (2017)

The 1996 Constitution makes reference to minorities and Indigenous People without referring to a specific ethnic group and for sake of National Unity, the position of the government is that there are no indigenous people in Cameroon. As such, there is no legal framework that recognizes Indigenous people. The definition and identification of Indigenous people in Cameroon is based on International Treaties and Conventions signed and ratified by the Cameroon government such as the United Nations Declaration on the Rights of Indigenous Peoples in 2007. Never the less, Cameroon has

demonstrated political Will to solve their problems of vulnerable population by complying with the requirements of some International Partners such as the African Commission on Human and People's Rights, the World Bank Civil Society Organizations who give guidelines for the consideration of the specific needs of indigenous people and their participation in decision making and governance.

2. MATERIAL AND METHODS

2.1. The Study area

The North West Region of Cameroon is located between latitudes 50 40' and 70 North of the equator and between longitudes 90 45'and 110 10' East of the Greenwich Meridian. It falls within the Western Highlands of Cameroon with a total land surface area of 17300 km2 and an average altitude of about 900m above sea level [14]. It shares international boundaries with the Federal Republic of Nigeria to the North and was the entry point of Fulani herders into Cameroon [15]. The region has a tropical climate characterized by two distinct seasons. A long wet season that runs from mid-March to November and a short dry season of three months. Annual average rainfall amounts range between 1500 to 2000mm while mean annual temperatures are about 21 to 24oc [16]. The agroecology of the North West Region is suitable for crop cultivation and animals. More than 60% of the region is viable for livestock production with a potential of 1054914 hectares of natural pastures [17]. Mbororo pastoralists are the dominant indigenous People dispersed all over the region.

2.2. Data collection and treatment

The study adopts mainly documentary and qualitative approaches in data collection. MBOSCUDA Reports were consulted as well as archives in the Divisional Delegations of Agriculture and Rural Development and from the Delegations of Livestock and Animal Husbandry for Boyo, Mexam, Bui and Ngoketunjia Divisions. Online sources were equally consulted. Interviews were conducted with key informants purposively selected from some grazing zones in the region. A total number of 32 interviews were conducted with Mbororo pastoralists (19) who have been practising rearing for more than 30 years, local authorities (2), Mbororo traditional authorities (3), state agents (3) and members of MBOSCUDA (5). These interviewees were purposively selected based on their level of involvement in pastoral activities and their levels of implications in development policy at the local level. Both documentary and primary data collected were treated in Atlas. Ti. and analyzed using content and thematic analysis.

3. RESULTS

3.1. Using Indigenous Knowledge to Observe and predict weather changes

Climatic perceptions are a prerequisite in the adoption of coping options. Mbororo pastoralists of the North West Region have a wide array of practices and knowledge systems that their embedded in their everyday activities. Surveys indicated several ways used by pastoralists in predicting changing climatic conditions and extreme events. Some landmark ecological knowledge indicators are used by pastoralists to predict environmental changes. The observation of changing wind directions, changes in sizes and shapes of some plants, and the behaviour of migratory birds and dragonflies, lizards and cattle behaviours have been used to depict the arrival and departure of rains was acknowledged by more than 85% of the population. These indigenous knowledge systems have helped them to reduce pressure on natural pastures, provide enough time for pasture regeneration, sustainably manage pastoral resources and reduce degradation. The skilful herding abilities of the Mbororos have permitted them to handle large herds along transhumance corridors in search of pasture. The seasonal movements between upslope and downslope as well as the rotational grazing system adopted by Mbororo pastoralists have helped to reduce pressure on resources and curb rangeland degradation. Transhumance provides enough time for pasture regeneration upslope while rotational grazing allows for better manure (cow dung) distribution that acts as a source of nutrients. This nutrient distribution has boasted pasture growth in areas that had suffered from overgrazing and degradation.

Their strong attachment to rangeland and their experiences in harsh environmental conditions have enabled them to predict changes in their environment. In 2019, a Mbororo herder said; "……we are conscious that our environment is changing and we can predict further changes. It is part of us because we have lived in the natural environment for all our lives. No one can tell us about changing environments more than we know"

This assertion was made along the slope of Sabga Hill (cattle departure zone for transhumance into the Ndop plain) as he showed us around his grazing land. It is testimony to the fact that Mbororos are observing climate changes and can properly report them. Their ability to forecast weather changes has been useful in fixing the period for departure on

transhumance. Mbororo communities have weather seers that read the climate, interpret to the population and guide their actions in the field. Those who exhibit such abilities and practices are mostly the elderly with strong traditional values. Some younger generations who spend their entire lives in the fields herding cattle have acquired such talent, which permits them to read landmark changes in the field but the interpretation is done by the old who conclude based on past experiences.

3.2. **Role of Indigenous Traditional Institutions**

3.2.1. **The Ardorates**

The effective implementation of traditional knowledge systems in climate change adaptation and the fight against environmental degradation requires strong traditional systems. Traditional institutions act like knowledge reservoirs that permit effective conservation and transmission of practices to future generations. Mbororo communities of the North West Region of Cameroon have organized traditional setups called Ardorates, under a recognized leader, the "Ardo". Their implantation in the North West Region dates back to the colonial period and nowadays. They have informal norms that regulate resource use and conservation. Their recognition by the native traditional rulers and local authorities has given them rights over the management of rangelands. Grazing zones in the North West are organized according to Ardorates and their limits are recognized by the agro-pastoral commission. As a result, these institutions watch against overgrazing and unsustainable practices.

The Ardo is the political and traditional head of the Fulani community at the level of the subdivision and the lamido at the regional level. The Ardo administers the Fulani through the Wakili, Maidaki, Galadima, chroma, Magaji and Imam who form the board of counsellors. Before the implementation of the British system of colonial administration in the Bamenda grassland in the late 1920s, the lamido of Sabga was the paramount chief of the Fulani in the Bamenda grassland. This is how the Fulani society was governed in collaboration with the local administration. The Ardo is the link between the administration and the Fulani community. The administration through the Senior Divisional Officers and the Divisional Officer passed through the Ardo to inform the community on the various decisions taken for the development of the community in terms of political, economic, religious and educational decisions. The Ardo mobilise their people to execute this decision.

3.2.2. **MBOSCUDA**

In 1992, the Mbororo Social and Cultural Development Association (MBOSCUDA) was founded and gradually developed into a nationally influential ethnic elite association. In a bid to improve sustainability, MBOSCUDA has been carrying out a series of activities to build capacity and ensure the effective transmission of indigenous knowledge from the older to the younger generation of Mbororo pastoralists. Pasture improvement efforts promoted by MBOSCUDA have been adopted by many pastoralists while the transhumant lifestyle of moving their animals down the valleys during the dry season in search of fresh pasture, crop residues and water, and going back to the plateau during the rainy season where they live with their families has reduced the rate of environmental degradation. They give their cattle salt regularly and 75% of animal health problems are treated or prevented using ethno-veterinary medicines and other indigenous practices such as cross-breeding local species with high-breed species that are resistant to environmental changes, pests and diseases.

To reduce weather shocks and sustain livelihoods, MBOSCUDA introduced farming alliance practices that include farmers and herders sharing land which is alternatively used to grow crops and graze livestock. When the land is used to paddock livestock, their manure and urine fertilize the soil making it more productive. Crops are planted once the cattle are taken off the land, and trends have demonstrated that crop yield is higher when livestock spend more time on the land during fallow seasons. Conversely, cattle that graze on the land used to grow crops are healthier and more productive. This practice is highly appreciated by the two community members who previously had a land use dispute but managed to resolve it through a mutually beneficial agro-pastoral farming alliance. Besides these social and economic benefits, this system has significantly curbed rangeland degradation in the North West region of Cameroon.

3.3. **Traditional Pasture management practices**

Pasture degradation is one of the immediate effects of climate variability that is visible in rangelands. To ensure rapid regeneration, Pastoralists have a culture of controlled pasture land burning during the dry season in preparation for pasture growth with the arrival of the first rains in March. In this practice, some ecological knowledge is used to distinguish between grass species and to delimit the rangeland to avoid bushfires. For instance, based on their ecological knowledge, they can know the regeneration ability of grass species as well as species that can tolerate drought conditions. In some areas, burning is selective, during which invasive and less nutritive species are burned to eliminate from the rangeland.

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With sedentarization, pastoralists have adopted pasture cultivation as a method to adapt to weather shocks. Pasture species such as “Brakeria and Guatemala are widely planted especially by those carrying out small-scale ranching. These planted pastures are used to graze cattle during periods of scarcity. These methods did not only help in feeding cattle during climatic disasters but has equally contributed in reducing pressure on grazing lands and combating degradation. This has also helped to reduce rate of transhumance, farmer grazier conflicts and the risk of disease contraction by animals.

3.4. **Water management and catchment protection practices**

It was reported during field studies that water sources are shrinking due to the vagaries of weather. The immediate effect has been conflicts over the diminishing resource and an increase in distances covered in search of water for cattle. However, as a remedy, community efforts aided by MBOSCUDA have enabled the construction water supply point for cattle in many Ardorates.

It was revealed that herders moved over long distances in search of water and pasture, especially in the dry season and that the availability of these water points has reduced movements as well as the adverse effects of water shortages on the livelihood of pastoralists. Field surveys revealed that most of these water supply points are treated by veterinary services, making them void of animal diseases.

Climate variability has equally aggravated bushfires and encroachment by crop farmers into water catchments. To curb this situation, the Mbororo communities have embarked on measures to protect their catchments against degradation through tree-planting initiatives. Mbororo leaders in the Kom highland collecting trees from a nursery for the protection of 111 catchments within the grazing zone. These trees were donated by the Centre for Indigenous Resources Management and Development (CIRMAD) to support efforts of the Muslim community within the Fundong municipality in the protection of water catchment and the fight against climate change. Within 9 grazing zones, 111 catchments were identified for the tree planting project (Figure 2)

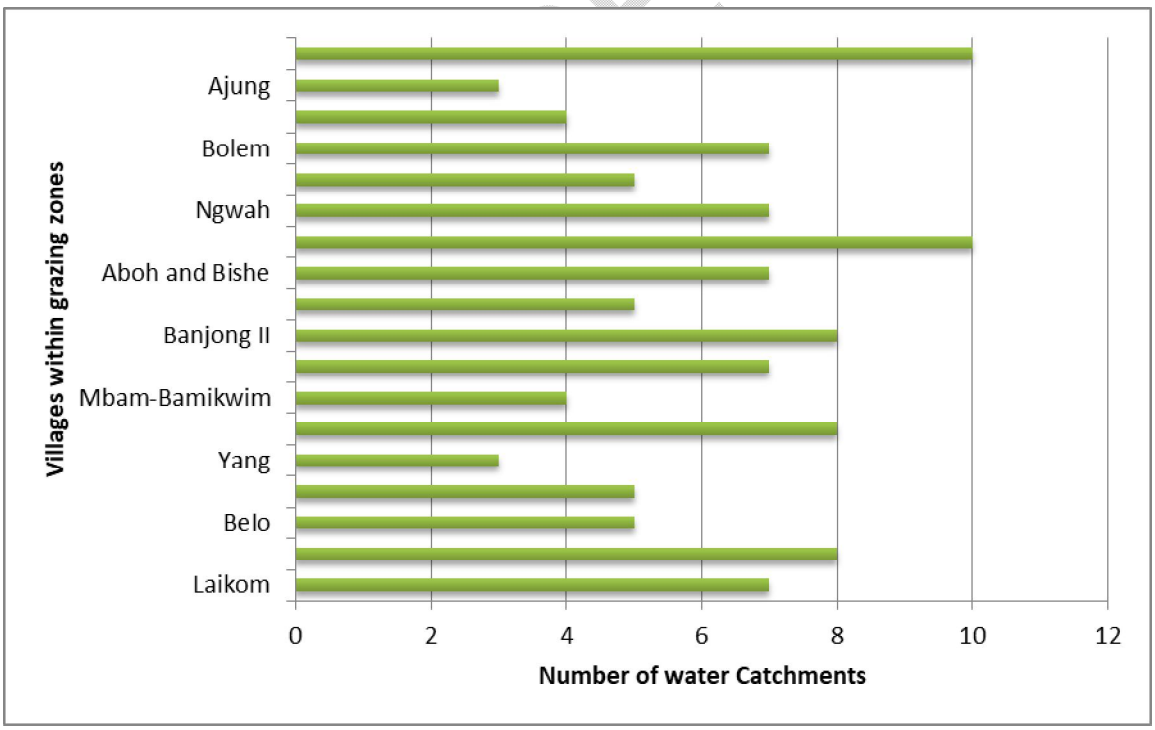

Figure 2: Mbororo villages with catchment protection projects

3.5. **Adoption of short distance transhumance as an adaptation option**

The adoption of short-distance transhumance has aided pastoralists in adapting to weather shocks. Though not a new strategy, the concept of short-distance transhumance is the seasonal alternative of land use between highlands and lowlands or a regular seasonal displacement of cattle for a complementary utilization of highlands and lowland pastures. Mbororo pastoralists identified the different relief levels with their varying climatic and vegetation types. From highlands and exposed hill slopes, they moved with their cattle to plains (Mbaw, Dumbo, Ndopetc) and river valleys such as Bui, Katsina-Ala and Mechum.

The seasonal exploitation of both plains and river valleys must have started since the arrival of the Mbororo pastoralists in the Grassfields. It started as vertical nomadism which is different from from transhumance in the sense that it was a random movement with a series of stops without a permanent settlement site. During transhumance, pastoralists move between grazing areas and exploit the spatio-temporal variation in pasture and water availability. However, these corridors lack security posts, veterinary posts, resting camps, water points and markets (Figure 3)

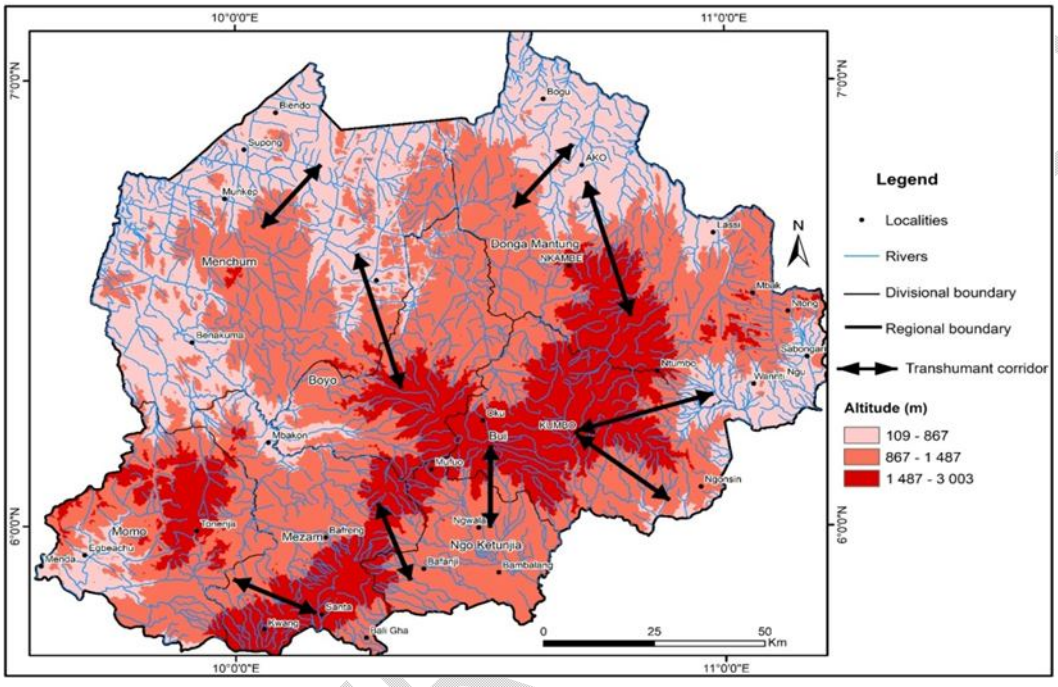

Figure 3: Transhumance corridors in the North West region of Cameroon

The transhumance movements are regulated by Presidential Decree No. 76/420 of 1976, regulating the movement and exploitation of livestock in the country. This decree modified by decree No. 86/755 of 1986 includes the provisions of transhumance activities: i) circulation of cattle movement from one Region to another for transhumance, needs an authorization from the Minister of MINEPIA; ii) cattle movement from one division to another needs an authorization from the Regional Delegates of livestock &fisheries; and iii) cattle movement from one sub-division to another needs an authorization from Divisional Delegate for livestock fisheries and animal husbandry. These regulations are not implemented in most cases as movements in most cases are an autonomous response to weather shocks. Recently, the effects of the socio-political unrest in the region have displaced many pastoralists into the West region, especially in the Noun Division.

3.6. **Challenges in the Integration of Indigenous Knowledge into policies**

Mbororo pastoralists have a huge knowledge system but their integration into policies has not been effective. This work identified two main groups of challenges, internal and external. Internal challenges are linked to the Mbororos themselves, pertaining to their socio-cultural background while external challenges come from public authorities and host communities.

3.6.1. **Internal Challenges**

Responses from interviews identified a number of draw backs within the Mbororo communities that hinder the integration of their knowledge systems (Table 1)

Table 1: Challenges in mainstreaming Mbororo Traditional knowledge

Challenges	**Groundedness**		**Density**	
	Frequency	**%**	**Frequency**	**%**
Land ownership challenges	11	22.9	10	24.4
Weak traditional Institutions	9	18.8	8	19.5
Low level of public participation	7	14.5	6	14.6
Low levels of education	7	14.5	5	12.2
Diversification of livelihoods	5	10.4	4	9.7
Gender Discrimination	5	10.4	3	7.3
Agro-pastoral conflicts	4	8.3	5	12.2
Total	48	100	41	100

These impacts were captured from transcriptions and coded in Atlas. ti. The intensity of these impacts was measured based on the groundedness and intensity of the various codes and quotations generated from interviews. Code frequency or groundedness refers to the number of times a quotation or an idea is expressed by different individuals while density refers to the number of links to other quotations. Land ownership was identified as a major concern (22.9%) and was proven to have a direct link with other factors with 24.4% outcomes, while financial challenges were the least with 8.3% groundedness and 12.2% links with other factors.

Challenges in the integration of Mbororo indigenous practices are diverse and originate from the Mbororo themselves as well as their host communities. Discrimination by native and administrative authorities limits adaptive capacity. Most native communities still consider Mbororos as intruding strangers in search of pasture for their animals. Institutions such as MBOSCUDA have embarked on the fight to ensure the respect of Mbororo rights as a people but findings revealed that efforts to boost the socio-economic development and professional integration of the Mbororos have contributed to the erosion of traditional institutions as well as ecological know-how (18.8%). The diversification of livelihood sources and increasing pressure on pastoral resources due to population expansion has contributed to eroding pastoralists' traditional landmark institutions. Mbororo youths are less interested in cattle herding and this has hindered the transmission of practices from the old to the new generation. Equally, stringent cultural norms (10.4%) have always pushed the Mbororo women to the background and prevented them from getting formal education. This has limited adaptation and increased vulnerability because women contribute a greater proportion of the population and they are in constant interaction with the environment.

3.6.2. **External challenges**

Findings have revealed that external challenges for the integration of Indigenous knowledge systems into policies are related to the lack of a legal framework and limited national policies to support the rights of Indigenous people. Despite the recognition by the International Labour Organization, the World Bank and other International partners, the Cameroon has paid attention to Indigenous people in her national policies. During fieldwork, a Mbororo human right activist declared.

"….*we are actively involved in making the government recognize and integrate the plight of the Mbororos into policies but challenges are enormous. We have identified issues of under representation at the local level… most initiatives taken in this country are mostly for personal interest with no policy implications.." (Interview, 2023)*

For instance, the management of agro-pastoral resources in the North West region of Cameroon is under the Agro-pastoral commission and the commission is found at the Divisional level.

The commission allocates and demarcates farmlands and grazing lands in rural areas according to the needs of the population as well as development needs, defines conditions for the use of mixed farming zones and control and management of agro-pastoral conflicts. However, this commission makes provision for only one Mbororo representative, who in most cases does not actively participate in decision making due to their cultural constraints. Also remarkable is the absence of women and youths from this commission where as they are most vulnerable and should actively participate in policy orientations for climate change adaptation.

At the national level, there is no legal framework in Cameroon for the recognition of the rights of indigenous people and for the integration of their knowledge systems as National policies are geared at ensuring national unity. This is glaring in the National Adaptation Plan of Climate Change in Cameroon (NAPCC).

The United Nations Framework Convention on Climate Change in 2011 developed the Cancun adaptation Framework in order to enhance adaptation according to national realities. This enabled developing countries to develop their National Adaptation Plans on Climate Change. The Cameroon government via the Ministry of Environment, Nature Protection and Sustainable Development in collaboration with partners such as Global Water Partnership and the German Technical Cooperation completed the National Adaptation Plan for Cameroon in 2015. This strategic document was motivated and facilitated by already existing spontaneous adaptation measures across the National territory. The objectives of the NAPCC include;

- Improve knowledge on climate change in Cameroon
- Inform, educate and mobilize the Cameroonian population to adapt to climate change
- Reduce population vulnerabilities to climate change in the main sectors and agro-ecological zones of the country
- Integrate adaptation to climate change into strategies and sectorial policies

A critical analysis of this strategic document demonstrates that indigenous people and their knowledge systems have not been integrated in the National adaptation policy.

4. DISCUSSIONS: MISMATCHES IN MAINSTREAMING PASTORALIST'S TRADITIONAL PRACTICES

Mbororo pastoralists of the North West region of Cameroon have a rich knowledge base which they have accumulated over the years due to their interaction with the natural environment. It is revealed that Mbororo pastoralists migrated into the region in the 1950s as nomadic herders and occupied marginal lands due to the nature of their activity. Their ability to sustain livelihoods is an indication of successful adaptation to harsh environmental conditions. Their closeness to, and constant interaction with nature permitted them to accumulate a wide array of ecological coping systems [2,4]. Pastoral practices such as the semi-nomadic and transhumance movement of cattle are still very common among Mbororo communities. Studies have revealed that such practices have limited the rate of resource degradation and reduced the vulnerability of pastoral systems to the vagaries of weather [5]. Equally, apart from predicting weather change by reading changes in plant and animal behaviours, cross-breed local species with high-breed species to produce a resistant breed of cattle, cultivating resistant pasture species, practising rotational grazing and using traditional medicines to treat emerging cattle diseases. These practices are capable of reducing climatic shocks and ensuring sustainable livelihoods [9, 11 and 12].

Nonetheless, there are mismatches at the level of policy development and implementation. The mainstreaming of traditional knowledge systems is necessary for the implementation of the National Adaptation Strategy. Cameroon has signed and ratified many international treaties and conventions and has put in place laws regarding the fight against climate change, environmental protection and the protection of the rights of minority groups and indigenous people. The United Nations Framework Convention on Climate Change (UNFCCC), during her 16th Conference of Parties (COPs 16) that took place in Cancun, Mexico in 2010, encouraged developing countries to integrate climate change adaptation into national development planning systems. Inspired by this, Cameroon developed a National Adaptation Plan for Climate Change (NAPCC) aimed at reducing the vulnerability of communities and limiting climate-driven risks across all sectors. Among the numerous axes of NAPCC, some projects target the improvement of local land governance in response to

climate change, reducing the vulnerability of livestock to climate change, adopting national gender policies and reducing their vulnerability to climate change and strengthening the capacities of local communities to ensure their participation in the adaptation process [18]. Surveys have revealed that pastoralist's knowledge systems are not considered. Studies have pointed to aspects of discrimination and marginalization of a minority group [15, 19].

Equally, there are mismatches between traditional knowledge systems and scientific knowledge in adaptation strategies. To ensure knowledge sharing, the Cameroon government through Presidential Degree No. 2009/410 of the 10th of December 2009b created a National Climate Change Observatory that provides climate change-related information and supports local organizations in climate change adaptation and mitigation. However, there is still a problem of dissemination. This gap can be bridged through the valorization of traditional knowledge systems.

In the domain of legislation on environmental governance, section 9 of law No. 96/12 entails the rights and responsibilities of everyone to protect and safeguard the environment. To do so, all parties, especially local and indigenous communities have to participate in decision making. It equally obliges the State to provide information to the people and build their capacities through education and training. In the same light, law No. 76/166 provides a framework for rangeland management and land governance but pastoralists are not implicated in decision-making [20, 21]. Participation in decision-making and capacity building of local communities is essential to response to challenges and ensure the sustainability of their livelihoods[22]. Effective participation is crucial for knowledge sharing and should be backed by the respect of minority rights, the role of law, equity and gender balances, transparency and good governance in the management of resources.

4. CONCLUSION

This work on the mainstream of pastoralist indigenous knowledge into climate change adaptation in the North West Region of Cameroon had as objective to assess the level of inclusion of traditional knowledge systems into adaptation planning. Using a qualitative approach, it is shown that indigenous pastoralists are a socio-cultural group that has collective ancestral ties to the natural environment where they live and carry out their activities. The inextricable link between their natural environment, resources and cultural identity has aided them in reading environmental changes and coping traditionally. Their ecological knowledge systems accumulated over the years and transferred across generations are not only useful in the observation and interpretation of weather patterns but most importantly in coping with the effects of climate change adaptation. They predict weather changes from plant and animal behaviours, cross-breed local species with high-breed species to produce resistant breeds of cattle, cultivate resistant pasture species, practice rotational grazing and use traditional medicines to treat cattle diseases. However, Mbororo pastoralists of the North West region of Cameroon have weak traditional institutions and are marginalized by the native population, thereby limiting their involvement in decision-making. Complex power and social relations shaping their interactions with non-indigenous institutions have restricted the effective main stream of their traditional knowledge into the national adaptation strategy. Hence, efforts are needed to strengthen Mbororo traditional institutions and make them knowledge reservoirs to heighten collective adaptation. There is a need to revise the agro-pastoral code to ensure the effective participation of pastoralists in the decision-making process. This will be a milestone in the integration of their knowledge systems and matching them with scientific knowledge for an inclusive adaptation policy in Cameroon.

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