



# The Ogiek Peoples' Indigenous Knowledge: A pathway towards Sustainable Natural Resource Management in the Mau Forest, Kenya

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## Abstract

This paper attempts to explore if indigenous knowledge (IK) has the potential to manage natural resources, and offer a new pathway towards sustainable natural resource management practices in the Mau Forest (MF). By looking into the cultural and historical resource management practice of the Ogiek tribe in the MF, natural resource managers can incorporate traditional ecological knowledge and bring a sense of responsibility, accountability, respectability and communality into resource management practices on-and-off protected natural resource landscapes. IK-based natural resource management practices were sourced from interviews conducted with the Ogiek elders/opinion leaders, and natural resource managers at the MF, and qualitatively targeted three sustainability themes; cultural preservation, socio-economic viability and ecological integrity, besides government intervention. Cultural preservation (41%), ecological integrity (32%), social-economic viability (18%), and government intervention (09%) were ranked as most important thru least important respectively. The study concluded that IK can serve as a valuable tool for natural resources management practice, and if mainstreamed, it holds potential to move politically connected tribes who are the main beneficiaries of the unsustainable harvesting of natural resources towards a positive 'can-do' future for sustainability. The study recommended that a national policy or framework on IK systems be developed in order to preserve, protect, and promote IK values for a more balanced and effective natural resource management practice for a sustainable future.

**Keywords:** Indigenous knowledge, natural resource management, sustainability, Ogiek people, Kenya

## Introduction

Human society continuously demands for goods and services derived from the conversion of natural resources to products they consume regardless of whether those natural resources may or may not be available in the future. In the recent past, international organizations (UN, WB, UNEP, etc.) have questioned the ethical and ecological ways people value and utilize nature which may have exceeded nature's resilience limits. The majority of the people in the western world believe that value and importance should be placed primarily on resource acquisition and affluence, since these are believed to directly benefit and to a large extent, define human wellbeing. Resource management to them typically focuses on a single species and not entire ecosystems and yet, human society is a complex adaptive system embedded in another complex adaptive system, the natural environment on which it ultimately depends for life. These systems co-evolve in mutual interaction, and they each consist of a myriad of subsystems that co-evolve in mutual and often synergistic interactions. There is permanent change and evolution which must be maintained if the systems are to remain viable and sustainable. The sustainability goal translates more accurately into a goal of sustainable development. Unfortunately, the planet is threatened by an unsustainable pursuit of ever-increasing wealth acquisition at the expense of nature (Taylor, 1986).

In Kenya, the creation of natural resources protected areas (national parks/reserves and forests) most of them located in and among indigenous people (the Maasai, Ogiek) was a strategy to conserve and protect natural resources. Unfortunately, this strategy is now acknowledged to have



largely failed leading to unsustainable resource utilization, natural resource use conflicts, polluted water/air, toxic landfills, climate change, desertification, and other symptoms of a 'sick' and unsustainable planet. The protected area conservation model is based on western knowledge (WK) and failed to take into consideration the natural resource management (NRM) practices, values and needs of indigenous people who had co-existed sustainably with those natural resources for millenia. Conservationists and ecologists Leopold (1949), Commoner (1971) and Deloria (1999) questioned the WK single-species management philosophy and wondered if they were enough to utilize and conserve natural resources when man is dominant, and not part of the environment.

It is therefore apparent that, an alternative approach is needed to remedy current environmental and social problems in order to sustainably utilize, manage and conserve natural resources for prosperity. With time, IK is beginning to be embraced as an antidote to the recent rampant path of environmental destruction and as an alternative pathway to a sustainable future for all (Ellen, Parkes & Bicker, 2000). IK is orally transmitted, undocumented and rooted in the lived experiences of indigenous peoples. It relies strongly on intuition, directly perceivable evidence, and an accumulation of historical experiences (Farrington & Martin, 1987; Agrawal, 1989). These experiences highlight the philosophies, beliefs, and educational processes of indigenous communities passed on from one generation to the next. This philosophical viewpoint historically tended to preserve ecological integrity within natural communities. Indigenous people believe that everything is related to the environment and humans are a part of that environment, they thus co-evolved and co-exist. This then means that they have historical continuity of resource use practices and often possess a broad knowledge base of the behavior/pattern of the complex ecological systems in their localities. For indigenous people, IK is the basis for local level decision making in agriculture, health care, food preparation, education, NRM, and a host of other activities (WB, 1998; Williams & Muchena, 2000). Because of their knowledge of the long-term sustainable management of natural resources, it is appropriate that this knowledge is tapped, recognized and applied if ecosystems and biodiversity are to be managed sustainably as a new pathway to sustainability.

### **Mau Forest (MF)**

The MF forms the largest indigenous forest block in Kenya, and the largest single block of closed-canopy forest ecosystem in East Africa (Nkako, et al., 2005). MF lies 1200 – 2,600m above sea level with annual rainfall of 2,000mm fairly well spread throughout the year and is supposedly a protected public forest. The word Mau comes from the Ogiek word 'Moouu' which translates into "coolest of the coolest" to mean the "cooled" (Sena, 2006). The forest covers an area of 273,300 hectares (675,000 acres) situated about 200km from Nairobi, and borders the counties of Kericho to the west, Nakuru to the north and Narok to the south/east in the Rift Valley. The forest has been traditionally inhabited by the Ogiek people but in recent years many other communities have unlawfully moved into the forest without regard to the Ogiek community who has lived in the forest since time immemorial (Nkako, et al., 2005; Sena, 2006).

The Importance of the MF is related to the ecosystem service it provides such as river flow regulations, flood mitigation, water storage, water purification, recharge of ground-water, reduced erosion and siltation, protection of biodiversity, carbon-sequestration, carbon reservoir and regulation of micro-climate (reduced global warming) which provides favorable conditions of optimum crop production, as well as many products such as medicinal plants, energy and food for humans and animals, and clean air. The MF is also rich in biological diversity in terms of flora and fauna which are the foundation of tourism. Water that originates from MF supports livelihoods and various socio-economic activities of more than four (4) million people in Kenya and Northern



Tanzania (UNEP, 2005; Kimayo, 2004). MF sustains major world famous tourism conservation and attractions like Lake Nakuru National Park, Maasai Mara National Reserve, and Lake Victoria, and thus supports key economic sectors in western Kenya such as energy, tourism, infrastructural development, agriculture, water supply, etc. creating direct/indirect employment and foreign exchange earnings particularly from tea and tourism (KWS, 2016; Daily Nation, 15<sup>th</sup> June 2005). The MF forms the upper catchment of major rivers that support livelihoods in Kenya and beyond. Including; Nzoia, Yala, Sondu Miriu, Mara, Kerio, Molo, Ewaso Ngiro, Njoro, Naishi, which feed partially or exclusively lakes; Natron (Tanzania), Victoria (E.A.), Baringo, Nakuru, Naivasha (Kenya). Lake Victoria in turn, feeds the River Nile, a river of significance in the region and beyond.

In the recent past however, the MF has experienced severe ecological degradation, as a result of widespread ill-planned settlements, encroachments and illegal extraction of indigenous forest resources. These changes in socio-economic activities are causing irreversible degradation of biodiversity with immense consequences across the ecosystem such as closure of industries, loss of employment, reduced agricultural production, food insecurity, loss of livelihoods and increased poverty, ethnic conflicts, insecurity and loss of revenue to the exchequer (Nkako, et al., 2005; UNEP, 2005; KWS, 2005). Kenya's natural resources generally and particularly closed canopy forest cover is disappearing at an alarming rate. For example, by 1986, Kenya's closed canopy forest covered 12,400 sq km a total of 2% of the country, and by 1996 it stood at less than 1.7% compared to the global and African forest cover of 21.4% and 9.25% respectively. By the 2009, this figure was still falling and had led to enormous negative socio-economic effects on the country (GoK, 2009). Environmental managers in Kenya are acknowledging that the current WK model of conservation practiced in Kenya is facing a lot of challenges that needs urgent solutions. According to Deloria (1999), knowledge of the historical relationships can be exceedingly useful in modern science in providing guidance for ecological restoration projects. There is evidence acknowledging the long-range environmental benefits of indigenous approaches for managing natural resources worldwide for sustainable livelihoods (McNeely, 1998; Lalonde & Morin-Labut, 1995; Huffman, 1992). It is time to acknowledge and utilize the Ogiek IK to regenerate, protect and conserve MF for sustainable livelihoods within and beyond the ecosystem.

### **The Ogiek People**

The Ogiek people are known to be the largest community of forest dwellers in East Africa with a population of approximately 20,000 people with a distinct language and culture (GoK, 2009). They are a hunter-gatherer group of people known to be the original owners of the MF. The Ogiek have in times past and within their own geographical settings developed a distinctive manner of life economically, socio-politically and culturally, and are solely dependent on the forest for their civilization, livelihoods and existence.

Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems (UNDESA, 2004).



The Ogiek are indigenous people, as defined in Article 1(b) of International Labor Convention No. 169, (1) and the United Nations and the African Commission on Human and Peoples' Rights have recognized them as such (ILO, 1989; Towett, 2004).

Indigenous people's lives are intimately bound with their environment which not only provides for them but also provide spiritual inspirations of life. Their cultural diversity is grounded in their territories and localities drawing together their social and natural worlds (Carruthers, 1992; IUCN, 1997). Indigenous communities around the world are constantly struggling to maintain their rights, their traditions and their knowledge, in a system still dominated by a western worldview. They face the challenge of living in two worlds, the indigenous and the non-indigenous one, in constant tension with each other, with the latter having more power in shaping the former.

For centuries, indigenous populations have suffered from invasion and oppression, and often times they have seen their knowledge eclipsed by western knowledge, imposed on them through western institutions. Yet, indigenous populations have managed to survive for centuries adapting in many different ways to adverse climate conditions and managing to create sustainable livelihood systems. Their diverse forms of knowledge, deeply rooted in their relationships with the environment as well as in cultural cohesion, have allowed many of these communities to maintain a sustainable use and management of natural resources, to protect their environment and to enhance their resilience; their ability to observe, adapt and mitigate has helped many communities face new and complex circumstances that have often severely impacted their way of living and their territories. The Ogiek have tenaciously clung to their culture and have always resisted any outside influences which may have negative effects on their culture, enabling them to sustain some semblance of unity, identity and cultural distinction to date. The British colonialists tried to flush them out of the Mau forest but failed. However, the Cartel Land Commission of 1932 legally denied them the right of ownership to their land (MF) and were "depro" claimed. Their ethnic identity was removed and MF was divided into then districts of Nakuru, Kericho and Narok. The explicit intent was to drive the so-called "primitive" people out of existence in the British colony and grab their land for settlement, farming and timber harvesting, but this was continuously resisted by the Ogiek (Towett, 2004).

When the government gazetted MF as government protected area, the Ogiek people lost their autonomy and their traditional economy collapsed. Instead the forest was targeted for eradication through logging, charcoal burning, government excisions mainly to politically influential individuals, private large scale cultivation of export crops leading to serious ecological disaster, and consequently the destruction of the Ogiek's natural and cultural landscapes (UNEP, 2005). The Ogiek, are commonly referred to as the 'caretakers' of the forest, and have existed for centuries in a peaceful and symbiotic relationship with the MF (Sang, 2002). They did this through generations successfully using their traditional ecological knowledge (TEK) (Obare & Wangare, 1998). The Ogiek people are "uniquely specialized people intimately related to a particular ecosystem and are incapable of retaining their essential characteristics, if that ecosystem is destroyed" (Blackburn, 1978; East African Wildlife society, 1978).

The Ogiek peoples' IK is unique to their culture and traditional management systems that enabled them to sustainably conserve MF which is a source of their livelihoods; honey harvesting, hunting, and gathering of wild fruits and nuts. To manage the forest properly, each clan was assigned an area to protect and hunt-gather based on natural features like rivers, valleys, hills or swamps as boundaries. This land tenure system was aimed at defusing feuds resulting from hunting, gathering and bee keeping rights (Sang, 2002). Other measures they used to conserve the forests were: ensured that there were no fire outbreaks but used well managed fires to control pests and other insects harmful to the environment and for forest regeneration; allowed only experienced



elders to carefully remove barks without any damage from particular trees to make beehives and then allowed the tree to regenerate; created awareness on important tree species which were used for honey and herbs and prohibited community members from cutting them down for any other activity and; designated and protected certain forests areas as shrines for cultural events. This shows how indigenous people had rich knowledge systems, values, respect, social relations, ecological governance, skills and expertise about their own territory, and the links between human activity, human culture and biodiversity which needs to be tapped for sustainability (UNESCO, 2008). Unfortunately, the Ogiek land has been forcefully taken away from them disregarding their culture and ability to maintain the ecosystem leading to environmental degradation, poverty, loss of identity, illiteracy and poor health (The Ogiek Welfare Association, 2005). To this great injustice has been added the effects of the forest policy that has progressively and on an immense scale replaced their indigenous forests with exotic (conifer) forest that are to the Ogiek, totally sterile and unproductive, and useless for bees, wild fruits and wild animals (Towett, 2004). The survival of the indigenous MF is inextricably linked with the survival of the Ogiek people.

## Indigenous Knowledge

Indigenous, traditional or local knowledge refers to the knowledge and know-how unique to a given society or culture, which encompasses “the cultural traditions, values, beliefs, and worldviews of local people” (Dei, 1993, in Agrawal, 1995, p.418), including specific beliefs, rules and taboos that are part of the customary law of a specific group (AIPP et al., 2012; Mu Xiuping and Kissya, 2010). Indigenous knowledge is therefore vital for the survival of the historical and cultural heritage of a particular group as it “forms [its] backbone of social, economic, scientific and technological identity” (Odora Hoppers, 2001: 76).

The IK approach to NRM derives from a philosophy that man is equal to all other lives and is rooted in the lived experiences of indigenous peoples passed down from generation to generation orally by tribal ancestors. These experiences highlight the philosophies, beliefs, and educational processes of indigenous people. IK is the place history of physical surroundings and how all life forms and how forces interact in harmony. It gives meaning and substance to sacred places. IK helps to reinforce our understanding of the creator and to care for and equally value all of creation. According to Deloria (1999), “respect involves two attitudes: the acceptance of self-discipline by humans and their communities to act responsibly towards other forms of life, and to establish communication and covenants with other forms of life on a mutually agreeable basis.” As Wuttunee (2000) explained, “For many cultures, the idea of direct connection to all living and non-living things has permeated their histories from a spiritual perspective from time immemorial.”

In the IK view, humanity has an equal, but not elevated status as part of a fabric of life, as do all other species and entities. The IK understanding of the environment and its surroundings is based on stories and traditions that have been passed down from older generations. There are very few written documents about these stories and traditions. Oral traditions are a “loosely held collection of anecdotal material that, taken together, explains the nature of the physical world as people have experienced it and the important events of their historical journey” (Deloria, 1997). IK is stored in culture in various forms, such as traditions, customs, folk stories, folk songs, folk dramas, legends, proverbs, myths, etc. Oral traditions not only provide information about ancient times, but they provide more about places, birds, plants, and animals from specific habitats and locations. This oral history information is what most tribes use for their teachings and for direction as to how to live in harmony and perform certain ceremonies, harvesting, hunting, gathering, and making tools from plants and animals in perpetuity. Understanding the integrative nature of the



landscape is essential to establish methods for sustainable management (Davis, & Ebbe, (eds) 1993; Sang, 2002).

Among the indigenous people, there is no idea that nature is somewhere over there while man is over here, nor that there is a great hierarchical ladder of being on which ground and trees occupy a very low rung, animals is slightly higher one, and man a very high one indeed-especially 'civilized' man" (Allen, 1981). Deloria (1979) observed, "Evolution, it seems, covers a multitude of scientific sins but does not explain anything". In the mainstream western view, humanity exists primarily and fundamentally to control and make use of the resources provided from nature; that view considers all other living things being created to address human needs and desires as the reason for their existence (Wuttunee, 2000). This detachment seems to be a problem in today's society because of the growing dependency on consumption and materialism, influenced by the media and advertising to generate artificial 'needs'. According to Deloria (1970), degradation of the environment is so severe that universe is "artificial", human society must try to break away from technology-as-the-answer and realize that the current path may lead to collapse. A renewed sense of community, cooperation, and shared responsibility, including a personal relationship to nature may be emerging. IK appreciates all forms of species, including humans and all life is appreciated for what it is and as it is.

Overshadowed by the pomp and promise of modern science and technology, IK systems have been disregarded until recently leading to interest to explore IK as a source of alternative management and conservation approach in order to minimize accelerating path of environmental degradation that has accelerated since the industrial revolution. 'Excerpt from Living Time' by Jay Griffiths, summarizes the contrast between IK and the WSK "the Euro-American image of time is a machine, a factory assembly-line chucking out identical hours, each un-remarked and indistinguishable. Worse than that, it has insisted that its time is the time, and that indigenous peoples all over the world lack 'proper' sense of time. It is not a lack, rather they have cultivated a far more subtle and sensitive relationship to time and timing".

Many indigenous people believe man lives as naturally as the wild flowers and the animal life surrounding him. Indigenous communities have lived in harmony with the environment and have utilized resources without impairing nature's capacity to regenerate them. IK shaped their values and attitudes towards environment, and it is these attitudes and values, which have guided their actions and made them sustainable. Deloria (1999) suggested that, it is time to consider an alternative pathway, and asked; why not IK? IK can help to develop sensitive and caring values and attitudes thereby promoting a vision of a sustainable future. However, in view of its potential value for sustainable NRM, it is necessary to preserve IK for the benefit of future generations (Leopold, 1949; Flanagan & Latturi, 2004; Pavlik & Wildcat, 2006).

## Natural Resource Management

The "civilized"/dominant society relies on western science to convert 'raw materials' of nature through technology into 'products and services' traded in the global economic system (Commoner, 1971). One of the major failures of mainstream resource management has been a lack of attention to the long-term implications of resource extraction practices (Menzies, 2006; Booth & Jacobs, 1990). Developed and developing countries have had good intentions in the management of natural resources e.g. damming rivers for flood control; suppressing forest fires for fire management; establishing petrochemical-based industrial farms to maximize food production, etc. However, with these efforts came unforeseen consequences or ecological backlashes due to a failure to recognize that nature is an interconnected web of interactive parts. Ecological damage resulting from unintended consequences of good intentions by western



scientific approaches to NRM may arise through incomplete understanding or misunderstanding of the integrated complexity of nature. According to Callicott (1982), the western tradition pictures nature as material, mechanical, and devoid of spirit, while indigenous people pictures nature throughout as an extended family or society of living beings.

Current natural resource management practices have had no consideration of or appreciation for traditional knowledge or cultural practices in this country. Fortunately, times are changing and IK is beginning to be embraced as an alternative or antidote to the recent accelerating path of environmental degradation that has accelerated since the industrial revolution. Environmental managers are acknowledging the long range environmental benefits of indigenous approaches for managing natural resources worldwide (McNeely, 1998; Huffman, 1992). Article 8(j) of the Convention of Biological Diversity (Rio, 1992) highlights the importance of IK in the mainstream of sustainable resource management and biodiversity conservation discourse. It recognized the innovativeness and applicability of IK in conservation and sustainable use of biological diversity.

The difference between indigenous people and western thought on nature is that indigenous people are part of the environment and include the human dimension in their management of natural resources while the western science believes that humans are outside nature and do not incorporate the human dimension aspects in their resource management practices. IK is a philosophical viewpoint that historically tended to preserve biological integrity within natural communities. It was practiced to maintain the livelihood of people through the sustaining use of resources for example, hunting, wild fruits gathering, honey harvesting/making, herbal medicine, self-supporting agricultural practices, etc. while western natural resource management decisions are based routinely upon the present or short-term future and are often directed toward a single species or extractive asset. It is therefore time for western science to listen to indigenous peoples who have a wealth of knowledge because of their ideas of cyclical time, time is constantly restored, nature sustained and sustaining (UN, 2007; Phillips, Ambuehl, & Phillips, 2008).

Sustainable resource management (SRM) is “an old philosophy that is being revived to cope with new problems. Care for the environment is essential to economic progress; that the natural resources of our planet are the base of all agriculture and industry, and that only by sustaining that base can we sustain human development” (Peterson, 1997). SRM may lead to many sustainable(s) i.e. sustainable tourism/agriculture/livelihoods/etc. For example, sustainable tourism (ST) is now seen as based upon three core principles. The first is quality; ST should provide a quality experience for visitors, while improving the quality of life of the host community and protecting the quality of the environment (Inskeep, 1991). The second is continuity; ST requires continuity of the resources upon which tourism is based, continuity of the culture of the host community, and continuity of visitor support or tourist demand (Wall, 1993). Finally, ST is about balance; it is tourism that balances the needs of the host, guest and the destination environment (Bramwell & Lane, 1993). One of the issues that hinder the realization of these three core principles of ST is non-inclusion of IK in conventional tourism development frameworks.

In the report “Realizing the Future We Want”, the UN System Task Team on the Post 2015 UN Development Agenda, acknowledges the importance of indigenous knowledge for environmental sustainability stating that “traditional and indigenous knowledge, adaptation and coping strategies can be assets for local response strategies” (2012:28). Therefore, in light of the new post-2015 sustainability agenda, it is essential to explore the linkages between sustainable development and indigenous knowledge, intended here as local knowledge of indigenous communities having its own epistemology and scientific validity and not as opposite to western knowledge. This exploration will provide an opportunity to understand how indigenous peoples in different regions of the world have been responding to ecological and development challenges and how, because



of their knowledge systems deeply rooted in local ecology, they can be valuable agents in maintaining global biodiversity and building resilience to climate change.

## Research Methodology

This study investigated how IK informed natural resource management and its potential as an alternative pathway to sustainable natural resource management (SNRM) practices. A qualitative methodology was the main method of information generation and analysis. A list of questions which focused on cultural preservation, ecological integrity and socio-economic validity formed the sources of data. However, Government intervention was added because it was deemed an important actor in the destruction, regeneration and conversation of natural resource. The paper relied on personal observation, informal interviews with respected Ogiek elders and literature review of secondary information.

Some 15 respondents including 11 respected elders, 2 respected local administrators and 2 Kenya Forest Service officers (KFS) were targeted to elicit information on IK practices in natural resource management in the MF. The justification for choosing the Ogiek was based on their ability to have managed MF an important water tower sustainably over the years. Interviewees' information was recorded on a CD for safe keeping and interpretation. The study proposes to inform those dominant tribes in Kenya who have long abandoned their traditional culture in favor of western inspired consumption and materialism of a possible alternative pathway toward SNRM.

## Result and Discussion

Information was sought on insights and perspectives on IK practices and approaches as perceived and/or used by the Ogiek people and results presented on fig. 1. It was established that cultural preservation (41%) was the cluster that generated the greatest response, followed by ecological integrity (32%), then socio-economic well-being (18%), and finally government Intervention (09%).

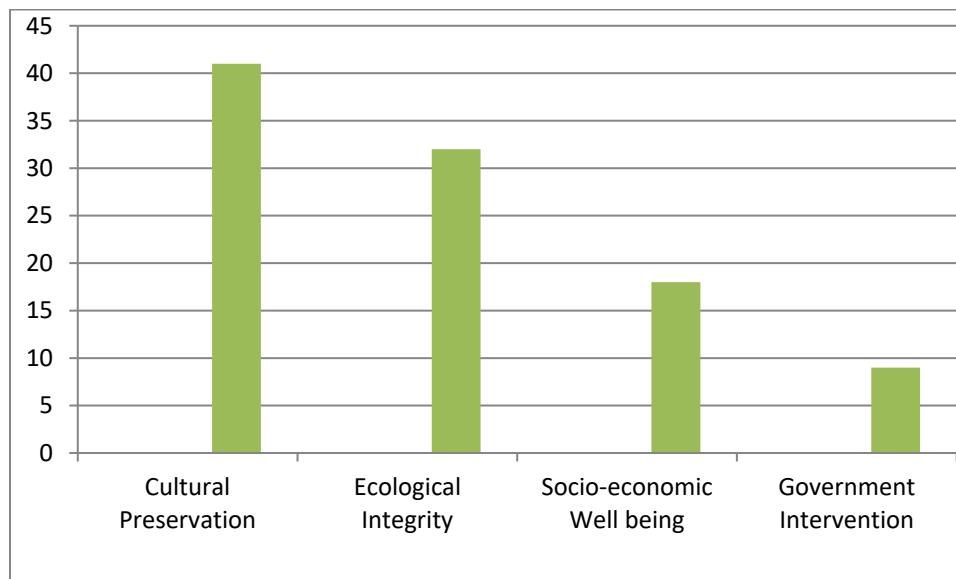


Fig 1.0: Cluster analysis results for the Ogiek Interviews



These results reflected the values and beliefs of what is important to the Ogiek people and the responses represent their personal and cultural system of who they are and what they believe in based on oral traditions passed from generation to generation. All NRM practices, techniques, and management tools used traditionally by the Ogiek stem from their oral traditions and reflect their basic belief system, and culture based on traditional ecological knowledge (TEK). The government intervention cluster scored the lowest ranking of perceived priorities possibly as a result of first, the negative experiences the Ogiek people have had with both the colonial and post-colonial governments about discrimination, forced evictions from the forest, killings, jail, thus the Ogiek do not trust the government; second, the Ogiek (particularly the very old) see the forest as a culture protector and not as a commercial venture, therefore, sustainability of the indigenous forest was crucial to the preservation of their culture, and thirdly, there was no support from the government to help them i.e. training and capacity building to enable them set-up conservation related enterprises in order to benefit from their forest.

### **The interviewee responses are summarized herein based on various clusters**

Interviewees (1, 2 and 3); the elders' voices on MF are not being heard by both national and county governments. "It is sad that no one (and especially young people) listens to the elders and goes to them for the advice and knowledge. There is too much influence from outside which makes us forget our culture. Let us find ways to minimize outside influence that makes us forget our cultural ways. The government and its agencies need to be more culturally sensitive and build trust with the Ogiek people. Unfortunately, government officials see conventional conservation practices as the only way to sustainability and therefore do not want to learn any other way. The government's attitude supports "dominant society's conviction that western science's management practices are 'the right and only way' and prevents acknowledging other resource management pathways that may be equally or more valid". In *The Closing Circle* (1971), Barry Commoner expressed concern for conflicts between science and politics. Public knowledge is essential to the solution of every environmental problem. Commoner's point was to 'close the circle' connecting environment, technology, economics, and government in harmony for sustainability requires a call for integration and systems thinking across academic disciplines, societal sectors, and governments for the greater good. There is knowledge out there which needs to be tapped (Commoner, 1971; Ngutu, 2000; Nakashima, Prott, & Bridgewater, 2000; Stavenhagen, 2004).

Interviewee (8 and11) asserted that: "... the area surrounding commercial investments (tea factory, maize millers) makes us cry; the land grabbers did not allow the Ogiek to move around to protect the indigenous trees for medicinal herbs, honey making, wild fruits and other cultural items before they wiped many acres of important Ogiek heritage for commercial investments. They did not follow sustained-yield practices of the Ogiek people. The destruction of the Ogiek peoples' livelihoods and a national heritage of huge magnitude is an unacceptable". In tropical agro-ecosystems in Thailand and Indonesia, for example, peasants commonly maintain more than 100 domestic plant species, as well as harboring in their paddies, rice varieties adapted to a range of environmental conditions (Altieri, 1999). Slash and burn agriculture as practiced by the Karen of northern Thailand offers one example of a sustainable farming system based upon indigenous knowledge and practice that enhances biological diversity. This is shows examples of successful use of IK for the benefit of indigenous communities. But in other indigenous community lands elsewhere, uncontrolled destruction of natural resources has affected many livelihoods (IUCN, 1997; Kamau, 2000; Gatundu, 2000; Williams, & Oliva, 2000; Kimayo, 2004).

Interviewee (6) expressed great concern on the current council of elders who are supposed to be the custodian of the Ogiek culture on behalf of the people: "There is no public information on the



so called development affecting the MF". He asked: "Is the Ogiek council of elders aware that a large section of the MF will be hived-off for commercial development thereby taking the trees off-sustainable yield and denying the Ogiek people their culture and livelihoods? If they knew, did they consult the people? We need to be thinking about our future generations like our ancestors did when the MF was virgin and was sustainably protected and preserved, and provided us with everything; food, medicine, security, clean water, clothing. The council of elders must find ways to increase public participation, sharing in decision-making, the importance of enhancing cultural practices and language; and planning for future generations. As things stand now, we must use other different strategies, the council of elders must lobby county and national governments, and international agencies for support in recognition, regaining, and regenerating the MF for our livelihoods" (Rambaldi, et al., 2007; UNEP, 2005).

On current tree harvesting practices targeting commercial logging and charcoal burning, Interviewee (4) said this: "The oils and gases that spills from loggers/charcoal burning are being dumped into the soil/air and are affecting the rivers/springs, water tables and the lakes that depend on MF endangering marine life, rain, quality of life/air, forests, medicine, tourism, food production, etc. It is clear that the biodiversity has significantly decreased because of the current forest clear-cutting practices which does not follow sustained-yield practiced by the Ogiek people. Trees, rivers, wildlife, wild fruits are either drying up or dying; floods are common; rain patterns have changed; agricultural production is erratic; I don't know what is really happening, may be this is what they call climate change". This finding supports common phenomena world over which needs immediate attention (Dowie, 2009; Sena, 2006).

Interviewee (10) said that what is happening in the MF currently is "... a practice that overlooks what has sustained the Ogiek people since the creator gave us this forest. These exploitative commercial agribusiness and settlement practices are hurting the Ogiek people culturally, ecologically and socio-economically. Surely, this must stop! We must go back to our old ways by reclaiming the MF. IK taught us how to sustainably leave in our 'home' and as an embodied practice directly rooted in everyday livelihood activities". We know that things are changing but we must be allowed to use our TEK to turn around our treasured 'home' and given time we can adapt to new environmental, cultural, political, or economic circumstances and make a significant contribution to a sustainable future (Menzies, 2006; Sena, 2006).

Interviewee (7), a respected elderly elder who had lived in the forest all his life, responding to the status of biodiversity on the MF said: "I sit outside my hut and see about ten to fifteen trucks coming from the forest hauling our best indigenous logs and sacks of charcoal to be processed and sold elsewhere, I ask myself why are they destroying our best indigenous trees which provided us with medicine, cloths, honey, food, security and protected our culture? Who will protect the Ogiek people and our way of life? This clear-cutting practice is very bad for the Ogiek people. They are killing all of us. These examples demonstrated the need to learn the peoples' culture, their way of life, and biodiversity before making decisions on economic development and projects which touch on biodiversity and peoples' culture". IK has assisted indigenous communities over time in conservation, health, agriculture, and economic sustainability which need to be appreciated (Hultkrantz, 1967; Lowie, 1970).

On mainstreaming IK practices, it was clear that not all the interviewees' responses were negative about the future of trying to mainstream IK into the 'civilized' society. For example, when asked; what is being done currently to enhance the awareness of IK practices? Interviewee (5) said, "... our council of elders and other elders who are thoroughly screened lately work collaboratively with Kenya Forest Service (KFS) to identify sacred cultural sites (ceremonial/events sites, burial grounds, etc) and once identified are conserved and protected from any human activities. Before



this initiative was launched, the commercial loggers and charcoal burners in cohorts with law enforcement agencies did not respect those cultural sites. All the interviewees said that sharing IK with others is fine as long as it was maintained by the Ogiek. If they do not want to learn, the consequences will affect all of us in some way. Civilized societies can learn and benefit from IK in areas such as traditional practices of hunting, food preservation, fishing, and gathering; respect for land; importance of natural resources to indigenous people and how they protect them. For example, ecological integrity was manifested in bark harvesting for medicine; the trees were carefully chosen, the bark was carefully removed by experienced and screened elders and this ensured continued use and regeneration. The understanding and respect of the Ogiek environment is what sustained natural resources and their use". However, the need for the rituals practiced in gathering and preparing herbal medicines for example, may not go down well with the 'civilized' society (Liebenstein, 2000; Dasgupta, 2009).

Interviewee (9) had this to say: "IK is our cultural ways and we incorporated it in our daily lives. Before we do anything we offer honey for all things we do such as honey harvesting, hunting, gathering, cultural ceremonies/events, etc. With the current challenges the Ogiek people are facing and the destruction of the MF, young people are now reassessing their attitudes/behavior towards their culture, and challenging western science know-it-all attitude in favor of their culture. For example, there are a lot of young people who want to study traditional honey making and harvesting, they need to know which trees to cut down and which ones to protect, and traditional hunter-gathering methods." This way IK is rejuvenated, used and preserved and further gives us a reason/purpose of continuing with our IK as key to our existence (Barume, 2005; Davis, 2000).

According to Interviewee (12), the Ogiek traditionally used fire as a major management tool to help regenerate, and to protect trees by reducing incoming invasive weed and pest species that were a threat to medicinal plants, wild fruits, and important cultural trees in the forest. As much as fire may be considered as unfriendly to natural resources by current NRM practices, indigenous communities in their wisdom used it in a controlled manner, to regenerate the natural resources. For the government to succeed in its forest preservation and regeneration efforts there is a need to tap into TEK and incorporate it in conventional conservation models (Phillips, et.al, 2008; Alan, & Associates, 1997).

Responding to KFS, a government agency mandated to protect and conserve all forests in Kenya, Interviewee (15) noted that KFS is here to keep everyone fighting and bickering and corruptly plundering our forest through illegal harvesting of timber, charcoal and firewood which is sold far and wide. They arrest innocent people, lock them up using trumped up charges and most of them are jailed for many years. They have always ignored our IK; surely, who can listen to and protect the Ogiek people and their 'home'? It is important that the people come first, but instead the current government and its agencies are destroying MF enriching themselves and their families, and are not interested with the welfare of the Ogiek people. KFS must try something different to save the MF. I suggest that they must collaboratively work with the elders, promote intergraded resource management planning, and provide training and funding for forest regeneration and conservation. It was noted that where current NRM practices were in harmony with the Ogiek TEK, then the Ogiek people were happy and expressed positive support, and if otherwise, they firmly opposed it and expressed a desire to be left alone to make their own management decisions (Taylor, 1986; UNEP, 2005; Phillips, 2008a).

Interviewee (13), our community currently does not have those then respected spiritual leaders, who were the custodians of our culture and in particular the language. The language is the most important value but we are progressively losing it, and most young people have left the community for socio-economic opportunities elsewhere. The Ogiek people must find better ways in an



unfriendly environment to promote our cultural traditions to our young people. The elders should seek to collaboratively set up programs with the county and national government to rejuvenate the language in order to preserve it because it is the most important component of our culture. (Menzies & Butler, 2006; Ellen, Parkes & Bicker, 2000).

On application of current western-driven natural resource management prescriptions in the MF, Interviewee (14) had this to say: there is both an increase and decrease in the biodiversity but most of it is not good for the Ogiek people because MF is almost cleared of indigenous trees that are part of our culture. Our source of honey, medicine, food, shelter, clean water/air, and wildlife has been almost completely destroyed and in the process has destroyed the Ogiek people's culture and livelihoods. For example, 'this diet of the white people is not that of our people'. Diseases like diabetes, high blood pressure, etc. have increased making the health of our people poor. Farmers are now 'growing' chicken and sell in 6 weeks (which otherwise should have taken about 24 weeks) because they use some "funny" injections and food which make the chicken grow very quickly. Look at the indigenous trees which we used for making mat, baskets and for conducting cultural ceremonies/events, they are dying off because of the invasive 'funny' insects and pesticides. With current management of natural resources, I think that it is going to be worse before it gets better. We used to protect these trees using our traditional wisdom which has been ignored. And yet, IK is often characterized as qualitative, holistic, oral, intuitive, practical, and cyclical, whereas, western science is portrayed as quantitative, reductionists, textual, analytical, theoretical, and linear (Wolf et al., 1991; Berkes, 1993; Berneshawi, 1997; Grenier, 1998). IK is always embedded in a particular cultural and ecological context; it is long-term, cumulative and contemporary, meaning that it adapts to changing circumstances and absorbs both new information and technology (Kabuye, (ed) 2002; Barasa, 2003; Daily Nation, 28 July 2009).

## Conclusion and Recommendation

IK is unique to every culture and society and it is embedded in community practices, institutions, relationships and rituals. It is a set of experiences generated by people living in those communities and therefore, represents all the skills and innovations of people and enables the collective wisdom and resourcefulness of the community. Over the years IK has guided indigenous people on how to sustainably utilize their natural resources using a variety of innovations to deal with environmental conservation and disaster management.

It was evident that IK is alive, and actively used by the Ogiek people. Interviewee responses indicated a strong attachment to the natural environment and deep respect for the indigenous MF. The Ogiek had strong ecological governance and social orientation. The forest was their security and protector of their culture, and it was their food store and pharmacy, and other livelihoods. The interviewees expressed a desire to be left alone to continue practicing their traditions in line with their ancestors. It was also established that young people desired to reclaim their cultural practices for ecological preservation and income generation though concern was expressed in regard to the place of culture in young people who have adapted to western driven consumption and ways of life in an "artificial universe". Concerns were also expressed in regard to misinterpretation by affluent of traditional IK-based values and their relationship to the environment as regards to rituals practiced in gathering and preparing herbal medicines, foods, etc. There was some indication that government agencies in conservation in a limited way are collaborating with indigenous people in natural resource management decisions. However, greed, non-compliance of existing laws and corruption have led to severe degradation of natural resources in the MF and has severely impacted negatively on the Ogiek peoples' way of life and livelihoods. The commercial harvesters of traditional trees for timber and charcoal do not recognize the existence and use of IK and have deliberately ignored its applicability in natural



resource management. Phillips and Phillips (2000a), wrote of the esteemed IK wisdom and quoted Black Elk a revered native Indian spiritual leader of the 19th century “the only way both dominant society and indigenous people would survive is when dominant society learned from native people that nature is the source and basis of life, meaning, and spirituality”. Indeed, Black Elk provides common ground that can facilitate change so urgently needed locally and globally for a sustainable future. The question remains, how can IK be accepted as an alternative pathway to a new era of sustainable management instead of being dismissed as a romantic viewpoint?

Documented literature on IK is limited in Kenya, because this knowledge is usually orally passed from generation to generation, through socialization processes by the elders. The reliability of this mode of information transfer is under threat in these modern times due to the influx of western culture, high levels of interaction between different communities, the passing - on of the custodians of this knowledge, the destruction of the ecological environments of indigenous people and lack of recognition and representation of indigenous peoples. Yet, conservation practices of the indigenous peoples ensured sustainability of natural resources, maintained a delicate balance that would ensure that practices that relied on the environment continued to flourish, such as weather predictions and traditional medical practices. It is very clear that the Ogiek's IK management of the MF enabled them to live in harmony and that IK is an important tool in environmental conservation that in turn has sustained various socio-economic activities in various ecosystems for a long time. Unfortunately, that is now threatened with extinction.

To move toward sustainability, scientists, philosophers, environmental thinkers, and more importantly, the general public, especially citizens of affluent nations, must shift toward a new paradigm where man is part of nature, and they also need to recognize and incorporate IK into NRM in order to ensure utilization of resources are culturally sustainable. Indigenous people's rights and ways of life must be respected and supported. Through dialogue between policy makers and indigenous peoples, IK can be used as a basis for natural resources planning and establish resource enterprises that are based on indigenous values, practices, priorities, and understanding for direct cultural, social, environmental and economic benefits. This will require improved awareness of the values and role of IK in NRM. The country in collaboration with the Ogiek tribe and other indigenous communities, should develop a national policy or framework based on IK systems in order to not only promote and protect IK systems, but also to create further platforms for interaction of indigenous knowledge, knowledge management, ICTs and development. This will ensure that: IK is preserved and accessible to the future generation, and also becomes a platform for dialogue concerning mobilizing IK for advocacy, asserting territorial rights based on historic usage and management of resources and strengthening intergenerational solidarity. It will also ensure that IK is integrated into formal and non-formal training and protected against exploitation. Furthermore, IK's value, contribution, and importance must be appreciated by both non-indigenous and indigenous peoples.

There is need to develop an integrated and collaborative management plan for MF in order to regenerate and conserve this important 'water tower' while nurturing IK to form the backbone of NRM practices for sustainability and prosperity. To empower indigenous peoples to take their rightful place in natural resources management in the modern technology driven economies, issues of capacity building and skills development, provision of information and appropriate technology, credit availability and accessibility, market accessibility, identification of sustainable entrepreneurial activities for indigenous people, etc must all be carefully addressed. The ultimate goal is to develop resource management practices that secure a sustainable future for all.



## References

- Alan, R. E. & Associates. (1997). Guidelines for environmental assessments and traditional knowledge: A report from the centre for traditional knowledge of the World Council of Indigenous People (draft), Ottawa.
- Allen, P. G. (1981). The scared hoop: a contemporary Indian on American literature, University of New Mexico Press.
- Altieri, M. A. (1999). The Agro-ecological dimensions of biodiversity in traditional farming systems in cultural and spiritual values of biodiversity, eds. Posey, D. A. UNEP, Nairobi Kenya, 291-297
- Barasa, D. W. (2007). Indigenous Knowledge Systems and Sustainable Development in Africa. Case study on Kenya. *Tribes and Tribals*, Special Volume 1, 141-156. Available online at <https://pdfs.semanticscholar.org/f922/c481d70f095b832cf0dad07631e175afc15b.pdf>
- Barume, A. (2005). Indigenous Battling for land Rights; The case of the Ogiek in Kenya, in J. Castellino et al. (eds), International Law and Indigenous people, Leiden, Nijhoff.
- Bednarek, A. T. (2001). Undamming rivers: Review of the ecological impacts of dam removal. *Environmental Management*, 27, 803-814.
- Beres, L., Hannon, J., Harris, G., Webster, D., & Welch, B. (1990). Natural resources considerations for economic development planning, St. Lawrence University, Canton.
- Berkes, F. (1993). Sacred Ecology: Traditional Ecological Knowledge and Resource Management, Taylor and Francis , Philadelphia, PA.
- Booth, A. L. & Jacobs, H. L. (1990). Ties that Bind: Native American beliefs as a foundation for Environmental consciousness. *Environmental Ethics*, Spring, 12(1): 27 – 43.
- Bramwell, B. & Lane, B. (1993). Sustainable Tourism: An evolving global approach, *Journal of sustainable Tourism*, 1(1): 1 - 5
- Brush, S. B. & Stabinsky, D. (1996). Valuing local knowledge: Indigenous people and intellectual property rights: Washington D. C.: Island Press
- Commoner, B. (1971). The Closing Circle: nature, man, technology. New York, NY: Alfred A. Knopf, Inc.
- Daily Nation (28 July 2009). Ogiek elders offer conservation skills; Restoration of the Mau Forest ecosystem website Available online at [http://www.iapad.org/wpcontent/uploads/2016/01/mau\\_crisis\\_2005f.pdf](http://www.iapad.org/wpcontent/uploads/2016/01/mau_crisis_2005f.pdf)
- Dasgupta, A. (2009). The Relevance of 'Indigenous Peoples': A case study of the Rajbansi community of North Bengal, In Mukherjee, A., Pal, P. K. and Sen, R.K. (eds) (2010): environment and sustainable development in India, New Delhi: D and D Publications.
- Davis, S. H. & Ebbe, K. (eds) (1993). Traditional knowledge and sustainable development: environmentally sustainable development proceedings series No. 4 WB, Washington.



Davis, T. (2000). Sustaining the forest, the people and the spirit; Albany, NY: State University of New York Press.

Deloria, V. Jr. (1999). Spirit & Reason: the Vine Deloria, Jr. Reader. Golden, CO: Fulcrum Publishing.

Deloria, V. Jr. (1979). The Metaphysics of Modern Existence. San Francisco, CA: Harper & Row Publishers.

Dowie, M. (2009). Conservation Refugees; The hundred year conflict between Global conservation and Native peoples, London; the MIT Press WB (1998)

Ellen, R., Parkes, P. & Bicker, A. (2000). Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives. London, UK: Gordon and Breach Publishing Group, New Fetter Lane.

Flanagan, C. & Latturi, M. (2004). Environmental assessment, local culture knowledge & water resource management, *Environmental Management*, 33.

Gari, J. A. (1999). Biodiversity conservation and use: Local and global considerations, science, technology and development Discussion Paper No 7, Center for International Development, Harvard University, MA.

Gatundu, C. (2000). Land Tenure and the Ogiek community of the Mau Forest in IUCN, Kampala, Uganda.

Huffman, J. L. (1992). An exploratory essay on nature, Americans and environmentalism. *University of Colorado Law Review*, 63(4): 901 -920.

Inskeep, E. (1991). Tourism Planning: An integrated and sustainable development approach, Van Nostrand Reinhold, NY.

IUCN (1997). Indigenous Peoples and sustainability: Cases and actions. Utrecht: International Books.

Kabuye, C. eds. (2002). Indigenous Knowledge for Biodiversity and Development; Nairobi National Museums of Kenya.

Kamau, J. (2000). The Ogiek: The on-going destruction of a minority tribe in Kenya, Rights Features Service. Available online at <http://www.ogiek.org/report/>

Kimayo, T. (2004). Ogiek land cases and Historical injustices 1902 – 2004, Nakuru, Ogiek Welfare Council

Lalonde, A. & Morris-Labut, G. (1999). IK innovations and sustainable development: an information sciences perspective, *Scandinavian Journal of Development Alternatives*, 14(1/2): 206 – 221.

Leopold, A. (1949). A sand county Almanac. New York, NY: Oxford University Press Inc.



Liebenstein, G. (2002). Indigenous Knowledge: Towards Indigenous Knowledge Information System, *IFLA Journal*, 28 (5-6). Available at <https://doi.org/10.1177/034003520202800513>

McNeely, J. A. (1998). People and protected areas: Parties in prosperity (eds) E. Keruf. The law of mother (pp. 249 – 258), San Francisco CA: Sierra Club.

Menzies, C. & Butler, C. (2006). In Menzies C. (eds). Traditional knowledge and national resource management (PP. vii-20) Lincoln, NE. University of Nebraska Press.

Nabhan, G. (2008). Sharing the Benefits of Plant Resources and Indigenous Scientific Knowledge: Washington, D. C.: Island Press.

Nakashima, D. (1998). Conceptualizing Nature: Cultural Context of Resource Management, *Nat. Resource*, 34(2): 8-22.

Nkako, F.M., LAmbrechts, C., Gachanja, M. and Woodley, B. (2005). Maasai Mau Forest Status Report Ewaso Nyiro South Development Authority, Narok, Kenya.

Ngutu, M. (2000). Forests under siege, *Daily Nation*, 11, Jan 2000.

Pavlik, S. & Wildcat, D, (2006). *Destroying Dogma Vine Deloria Jr. and His influence on American Society*. Golden Co: Fulcrum Publishing.

Peterson, T. (1997). Sharing the Earth: the rhetoric of sustainable development, University of South Carolina Press, Columbia, SC.

Phillips, V.D. (2008a). Governance and changing responsibilities needed to build a sustainable future; In *Proceedings of 5<sup>th</sup> International Conference of Environmental Management for Sustainable Universities*. Barcelona, Spain. Olt. 15-17

Phillips, V.D., Ambuehl, R. & Phillips, M.M. (2008). Mainstreaming indigenous wisdom to help dominant society build a sustainable future; In *Proceedings of International Conference on Sharing Indigenous Wisdom*. College of Menominee Nation, Green Bay, WI, June 11-15, 2007

Rambaldi, G., Muhami, J., Crawhakk, N. & Moraci, L. (2007). Through the Eyes of Hunters-gathers: Participatory 3D Modelling among Ogiek Indigenous Peoples in Kenya. *Information Development*, 23 (2-3).

Ruddle, K. & Johannes, R. E. eds. (1985). The traditional knowledge and management of coastal systems in Asia and the Pacific, UNESCO, Jakarta, Indonesia

Sang, J. (2001). The Ogiek in Mau Forest. Available online at [https://www.academia.edu/36235838/Case\\_study\\_3\\_Kenya\\_The\\_Ogiek\\_in\\_Mau\\_Forest](https://www.academia.edu/36235838/Case_study_3_Kenya_The_Ogiek_in_Mau_Forest)

Sena, K. (2006). Mau forest: Killing the Goose but still wanting the Golden Eggs! Available online at [https://www.iwgia.org/images/publications/IA\\_4-06\\_Mau.pdf](https://www.iwgia.org/images/publications/IA_4-06_Mau.pdf)

Sillitoe, P. (1998). Defining indigenous knowledge: The knowledge continuum: *Indigenous Knowledge and Development Monitor*, 6(3), 14-15.



Slikkerveer, L. J., Liebenstein, G. W. & Warren, D. M. (1993). Networking for Indigenous Knowledge: *Indigenous Knowledge and Development Monitor*, 1(1), 2-4.

Stavenhagen, A. (2004). 'Indigenous peoples in comparative problem and policies, United Nations Development Programme, Human Development Report Office Available online at [http://hdr.undp.org/sites/default/files/hdr2004\\_rodolfo\\_stavenhagen.pdf](http://hdr.undp.org/sites/default/files/hdr2004_rodolfo_stavenhagen.pdf)

Taylor, P. W. (1986). Respect for nature: A theory of environmental ethics, Princeton: Princeton University Press,

The Kenya Land Commission Final Report (1932). Evidence from the Dorobo, Vol.3, October.17, 1932: Kenya National Archives, Nairobi, Kenya.

UN (2007). United Nations Declaration, the rights of Indigenous peoples. Available online at <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

UN (992). Article 8(j), the convention of Biological Diversity - commonly known as Rio (1992), Rio De Janeiro, Brazil.

UNDESA. (2004). Workshop on Data Collection and Disaggregation for Indigenous Peoples: The Concept of Indigenous peoples. 19-21 January 2004. NY, New York.

UNEP (2005). Mau Complex under Siege: Continuous destruction of Kenya's largest forest. Daily Nation (28 July 2009). Ogiek elders offer conservation skills; Restoration of the Mau Forest ecosystem website

Wall, G. (1993). Towards a tourism typology in (eds). Tourism Sustainable Development eds Nelson, J. G., Butler, R. & Wall, G., University of Waterloo, Canada

Warren, D.M, (1989). The impact of 19th century social science in established negative values and attitudes towards indigenous knowledge, In. D.M. Warren, L.J. Slikkerveer and S.O. Titilola (Eds.) Indigenous Knowledge Systems: Implications for Agriculture and International Development, Studies in Technology and Social Change, No 11. Ames, Iowa State University pp. 171-183.

West, P., Igoe, J. & Brockington, D, (2006). Parks and people, the social impacts of protected areas: *The Annual Review of Anthropology*, 35, 251-277.

Williams, D. & Muchena, O.N. (2000). Utilizing Indigenous Knowledge System in Agricultural Education to Promote Sustainable Agriculture, *Journal of Agricultural Education*, 32 (4), 52-57.

Wuttunee, W. (2000). Diversity in Sustainable Development Approaches: Hope for the Future. Aboriginal Health, Identity and Resources (pp 324 – 341), Winnipeg, Manitoba, Native Studies Press



## Interview Questions:

### Cultural preservation/Ecological integrity

- 1) What is Indigenous Knowledge (IK)? ...
- 2) How is this knowledge used in sustainability practices of the Ogiek people? ...
- 3) Name all the cultural traditions that you consider important in your community... .
- 4) Identify those that are incorporated in the natural resource management practices among your people. ...
- 5) What can be done strengthen IK approaches to become part of future natural resources management across Kenya? ...
- 6) When harvesting resources of the forest, what were/are the roles of elders? ...

### Socio-Economic viability/Ecological integrity

- 7) What was the purpose of undertaking natural resource management practices historically? .....
- 8) How do feel about strengthening IK approaches in natural resource management?..
- 9) How do feel about mainstreaming IK approaches in the future natural resources management of dominant communities?....(Describe how you feel about strengthening IK approaches, and how you feel about mainstreaming IK approaches in the future natural resources management of dominant tribes)
- 10) With the introduction and application of western-dominated natural resource management practices, do you perceive an increase or decrease in: (a) the biodiversity of species and their habitats?... (b) cultural norms and practices?...
- 11) Are there any current opportunities or initiatives for economic growth through cultural or natural resource management on your community land? ...

### Socio-Economic viability/Cultural preservation

“Do not cut more trees than you plant in one cycle, and can only harvest mature trees and dead trees”: is this philosophy still used today in forest management practices? ...

- 12) Can this model of successful IK be applied to NRM in dominant communities?....
- 13) In this community which members of (a) the family unit and (b) the community currently participate in the development of new natural resource management practices using the culture traditions? ...
- 14) Are you doing the things your ancestors would proudly have done with an eye for the future? ...



15) What sustainable livelihoods do you envision as being viable in your community? ...

### **Cultural preservation/Government Intervention**

16) Does the government practice 'sustained-yield' of forest harvesting? ...

17) How does the Government determine which natural resource management practices are implemented for the Ogiek community? ...

18) What is your opinion of the government Interventions with your community's claim of the MFC as your home? ...

19) Currently, (a) Are there some Ogiek cultural aspects that are being incorporated into natural resource management in the MFC?... (b) Which are they?...(c)How are they carried out by government enforcement and protection?....(d)What is the success rate compared to Ogiek NRM practices?...(e) What suggestions will you make in the use and application of IK in NRM?...