# AFRICAN ENVIRONMENTAL VALUES AND CLIMATIC CHANGE

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**Abstract:** The current energy and food crises have created additional pressure on African natural resources in order to meet capitalist interests, both local and foreign and in host countries. Moreover, the guiding principles in managing environment are now being influenced by new bureaucratic assigned values with little attention to the role of African ecological knowledge in preserving nature. The destruction of traditional values has affected ethical decisions making of most policy makers in poor countries in favor of capitalistic values of individualism and self-satisfaction. Natural resources are seen as objects for exploitation and profit making, especially being used for individual private gain and self-satisfaction. African value system that used to help keep a balance between human activities and environment has not only changed, but has been neglected in managing our environments. Yet, this knowledge has been generated from generation to generation and could be very useful in managing the current global crisis of climatic change. Similarly, capitalist values have altered people's attitudes towards natural resources, being seen as objects for exploitation. In seeking for solutions to global environmental problems, African environmental values were explored in the context of environmental decision making. Traditional ecological knowledge is considered as an alternative for Sub Saharan Africa, sharing the view on natural environment as a cultural heritage in achieving a sustainable development. It is a motivating force and valuable way of life for managing our common future in the era of climatic change. This study appreciates African habits, practices, traditions, and values that protect, and foster natural environment, and further explains how people's attitudes have changed towards sacred forests, exploiting and cutting down trees to meet individual ends. African held values are often expressed in terms of environmental values, the relative importance or worth of an object to an individual or group in a given context, in which the assigned value is based on. However, the relevance of African ecological knowledge in environmental conservationism has continued to receive little attention, both at local, national and international levels. The notion within the conventional wisdom is that environmental concern is related to post-materialist value, and that poor people, who struggle to sustain their basic daily and material needs do not care about the environment. However, the notion that only rich peoples and nations express their environmental concerns and/or whether economic wellbeing precedes environmentalism is highly questioned. Specific local context shows that poor rural Africans have deep rooted held values for the environment. Social context and cultural factors shape environmental values and determine the value formation process. For policy makers, much attention is focused on economic expression of values. However, this has attracted criticisms in articulating the wide range of environmental values, in which the economic expression ignores held values and pays more attention to assigned values. This article explores the role of African values in preserving the environment as an alternative to individualistic capitalist values. Using local perspective on environment conservation, this paper reviews the sources of values influencing the loss of African natural resources in the current era of climatic change. It draws the relevance of African ecological knowledge in motivating environmental sustainability that could be utilized, although it has received little attention in the development discourse of sustainable development.

**Keywords:** sustainable development, climatic change, value system, sacred ecology and traditional ecological knowledge

## INTRODUCTION

Climatic change poses increasing pressure on the planet resulting from increasing carbon emissions, water scarcity and energy crisis, coupled with increasing population and food

shortages. All these factors influence sustainability of natural resources. Against this background, the relevance of African environmental values was explored in the local context of environmental decision making. African ecological knowledge is passed from generation to generation through symbolic and ethical messages that promote reverence for nature. Positive values towards the use of natural resources were inculcated from generation to generation through stories, proverbs, and songs (Omari 1990:170). This provides very useful information for understanding current environmental problems. There is need to weigh our human demands with the ability of the environment to provide us with the resources, both for the presence and future generations, especially in Africa where our environment matters to the poor households (VanDe Veer and Peer 2002).

African societies have undergone rapid changes due to the impact of western value systems. Capitalism has affected African's attitudes towards nature and natural resources. Resources are used for individual private gain and self-satisfaction, subject to exploitation and profit making. The western concept of individual achievement through power relationships has undermined the communal decision making process which used to help the community maintain a balance between available resources and uses by individuals. Today, most decisions about resources use are based on bureaucratic and legal systems. Many of the economic activities which seemed to threaten the African ecology are done in the name of development. Transnational Corporations, Governments and Local Agents conduct activities that have long term environmental effects. Countries are normally lured by profits they get out of the business, and decisions are mainly made on the basis of bureaucratic decision procedure. This justifies Africa's rain forest lost annually. African deforestation affects forests, which are sources of water resources and rainfall. In fact, the value systems which used to keep a balance between human and environment have changed, and are being controlled and motivated by greed for capital accumulation on individual basis (Omari 1990:171). The introduction of western values (money economy) and state control of natural resources have destroyed the indigenous belief systems, affecting the ethical decisions which do not focus on community benefits, but on what state and individual will get through the exploitation of natural resources. Moreover, decisions are made at high levels of state bureaucracy without prior consultations with the local people (Omari 1990:172).

In seeking for solutions to global environmental issues, this article considers traditional ecological knowledge as an alternative for Sub Saharan Africa, sharing the alternative view of natural environment as a cultural heritage in achieving a sustainable development. It appreciates African habits, practices, traditions, and values that protect, and foster the natural environment and further explores how people's attitudes have changed towards sacred forests, exploiting and cutting down trees to meet individual ends.

## METHODOLOGY

The article first reviews existing scholarship on environmental values and ethics, and then provides insight into specific local regional situations in Northern Uganda. The different conceptions about values are compared in order to understand the distinction between held and assigned values. The determinants and kinds of assigned values are discussed, including the appropriateness of assigned values in allocation decisions. It then presents the local view on preserving nature in Acholi sub region of Northern Uganda. The interest was to assess the deep values Africans have for the environment. Oral history interviews were conducted to explore the socio-ecological role and practices that maintain trees in the human sphere. The concept of Traditional Ecological Knowledge was chosen to show how a low cost approach to protecting and sustaining natural resources can be utilized to help solve local ecological problems facing modern societies. The behavioral rules that conserved the wild tree and its contribution to rural economy and livelihoods were explored. The study describes how nature and culture combine to shape wild trees in the region.

## DEFINITIONS AND CONCEPTS

Environment is broadly defined as a community's natural surroundings (air, water and land) that contain natural resources (wood, herbs and medicine) for which the availability, accessibility and quality shape rural livelihoods and the overall health and well-being. Therefore, the local environment refers to the local setting within which proximate natural resources support rural livelihoods (Hunter et al. 2010). The state of the local natural environment is central to the well-being of millions of rural households in developing countries. Environmental concern represents a specific component of broader environmental perceptions such as problem of resource availability, accessibility and quality.

Engel (1990) defines sustainable development in its broadest form as "the kind of human activity that nourishes and perpetuates the historical fulfillment of the whole community of life on the Earth" and ethics

as a disciplined reflection by persons in all walks of life on moral ideas and ideals form a new social paradigm for sustainable development (Engel 1990:7, 8&10). The moral values and cognitive beliefs of a culture play an important role in how well human being adapt to the natural environment. Therefore, our approaches to sustainable development should differ depending on the cultural heritage and religious traditions through recognition of ecological knowledge, and an awareness of how modern cultural values have destroyed sustainable resource uses. We should appreciate the way in which moral ideals motivate persons to care for the world around them. It is through ethics that our roles are clarified through the value system in policy decisions and giving moral reasons for alternative course of action. By respecting nature, we can even achieve the ecological integrity towards the green economy. Ethics helps in resolving some of the outstanding value conflicts that thwart conservation and development projects and even in defining a new social paradigm.

The definition of Indigenous Knowledge (IK) is not clear. As defined by UNEP (2008), it is a body of knowledge built up by a group of people through generations living in close contact with nature. In a broader sense, it is the knowledge used by local people to make a living in a particular environment. Similarly, FAO (2011) refers IK to the knowledge, innovation and practices of indigenous and local communities. It is developed from experience gained over time and adapted to local culture and environment. It is transmitted orally from generation to generation and tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices (FAO 2011:78).
However, some scholars prefer using the term ecological knowledge because of changes. Ecological knowledge is "a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handled down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes 1999:8). This is because traditional knowledge is limited to more explicitly ecological knowledge and it is a sub set of indigenous knowledge, Berkes (1999:8), prefers to take indigenous knowledge to mean ecological knowledge.

Then what is Traditional Ecological Knowledge (TEK)? It also has no universal definition because of the ambiguity of the words traditional and knowledge. Even if traditional can be taken to mean cultural continuity transmitted in the form of social attitudes, beliefs, principles and conventions of behavior and practice derived from historical experience, societies change through time, constantly adopting to new practices and technologies making it difficult to define just how much and what kind of change would affect the labeling of a practice as traditional. Because of these changes, some scholars prefer using indigenous ecological knowledge in order to avoid debate about traditional and explicitly put the emphasis on indigenous peoples (Berkes 1993:3). Anyway, debating which concept is right is beyond the scope of this article.

This study therefore uses definition by Berkes (1993) whereby the focus was put on the salient attributes of TEK to arrive at a working definition: TEK is a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Furthermore, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them are indigenous or tribal (Berkes 1993:3).

## ASSIGNED VALUES, ITS CONTEXTUAL NATURE AND APPROPRIATENESS IN ALLOCATION DECISIONS

The term value has many meanings. The different meanings may include: a) the amount to money, goods, or services, considered being equivalent to a thing or for which it can be exchanged; b) desirability, usefulness, importance; c) the ability of thing to serve a purpose or cause an effect; and d) one's principles or standards. These four definitions are related to economic, social, ecological and ethical/philosophical concerns, respectively (Hawkins 1990). However, this study is concerned with the social and ecological and ethical values in African context of environmental values.

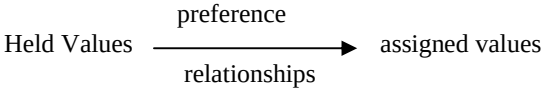
As noted above, value has many meanings. Many noneconomic works on value begin with a discussion of the problems caused by the many meanings. Preference is used in the concept of value to mean the setting by an individual of one thing or above another thing because of a notion of betterness. Preference-related value concepts directly involve human preference. To understand preference-related concepts, three realms are highlighted: the conceptual, the relational, and the object realms (Brown 1984:232).
In terms of the conceptual realm, a value is an enduring conception of the preferable which influences choice and action. This conception of preference can be in terms of first order preference, which influences all subsequent, second order

preferences (and therefore, all choice and action). This underlies all preferences. Preferences are often labeled as values or ideals. They include modes of behavior (e.g. bravery, loyalty), end-states (e.g. freedom, happiness), and qualities (e.g. beauty, symmetry). These are called ideals held values (Brown 1984:232). As stated above, held values constitute modes of conduct, end-states, or qualities which could be desirable. Rescher (1969) suggests several ways to categorize held values. He calls held values as underlying values or value proper. The first category is subscription to the value, which include: 1) personal values (e.g. happiness, wisdom), 2) professional values (e.g. dedication, hard work), 3) national values (e.g. loyalty, patriotism, etc). Another way of looking at held values is in terms of environmental values (e.g. beauty, novelty), individual values (e.g. bravery, intelligence), group values (e.g. respect, mutual trust). Brown (1984:233) noted that value in the conceptual sense is used to signify both a conception of the preferable which guide action and any one of numerous modes of conduct, end-states, or qualities which are part of the conception.

In relational term, value arises from a preference relationship between a subject and an object. Value is depicted neither a concept held by the subject nor something attributed to the object, but merely that which arises from the preference of a subject in a given context. Value in the relational realm is not observable, but it is only at the feeling level (Brown 1984:233).

In the object realm, value is the expressed relative importance or worth of an object to an individual or group in a given context. The relative importance or worth results from a preference relationship. Such relative value has no absolute value standard, and thus can only be expressed in terms of importance or worth of an object by implicit or explicit comparison. Due to lack of better term, value in object realm will be called assigned value. It is not the ideal type because it suggests something called value is assigned to an object (Brown 1984:233). Because of person's held values, the importance or worth, what we called assigned value will be based on the expression of importance or worth of the object assigned value.

Natural resource managers must consider the full range of resource values in formulating management plans and policies. Norms are held values which influence individual preference. They are held values to which others are asked to assign great value (Brown 1984:234). Held values provide a basis for the preference relationships which result in the expressed relative importance or worth of objects. This expressed relative importance or worth is called assigned value. In fact, it has been argued that for public policy, certain natural objects should be assigned great value. The distinction between held values and assigned value is fundamental. However, differentiating is difficult at the conceptual label. Alternatively, in the object realm, specific held values, like all objects, can be assigned value. In fact, one's value system is the basis of assignment of value (Brown 1984:234). The plausible relationship among the three preference-related realms of value is illustrated below:




Source: Brown 1984, p.234

Information about assigned value comes from different sources, scales and measures: (a) Assigned value can be expressed by two modes, actions, or a word (e.g.opinion); (b) Assigned value is expressed in numerous scales, either as ordinal or interval; (c) A statement by A that he prefer X to Y is an ordinal expression of assigned value; (e) A statement that W is worth three times as much as Z is another interval assigned to value expression; (f) Another source of ordinal, or perhaps, interval, scale judgments is a survey that uses a rating scale response format (Brown 1984:235)

Expressions of assigned value are made by individual or groups of individuals for individuals or groups. These two types of sources and constituencies four possible sources for assigned value described in table 1

The value assigned to an object by a person depends on: 1) the person's perception of the object and all other relevant objects; 2) the person's held values and associated preferences; and 3) the context of the valuation. The person's perception is measured by what he sees and understands about the object(s). The perception of person's held values describe the personal concepts of the preferable that facilitate establishing a preference (Brown 1984:235). Several factors determine the context of the valuation, including 1) the internal state of the evaluator, 2) the valuator's external situation and expectations for the future changes in that situation, 3) the social setting of the valuation, 4) the mode, scale and measure in which the valuation is expressed and 5) the constituency of the valuation. The internal state of the evaluator includes both physical and emotional

Table 1: Types of sources and constituencies for possible sources for assigned value

| | Source | |
|---|---|---|
| Constituency | Individual | group |
| Individual | 1 | 3 |
| Group | 2 | 4 |

Source: Brown 1984, p.235

*case 1: individual can indicate the value he or she assigns to something for another individual

**case 2: individuals can also express opinion about the value they assign for groups of individuals

***groups expressions of assigned value are derived from two or more individual expressions.

variables. The valuator's external situation includes variables such as financial situation, free time, possessions, and environmental conditions.

The constituency is the individual or group that the valuator is representing when making the valuation. The value assigned to a natural area or park may depend on whether one is representing only oneself or one's family, or attempting to represent society in general. Most individuals often provide expressions of assigned value as if they were representing only themselves or a group of people (perhaps society in general) (Brown 1984:236).

In general, one's held values probably provide a basis for the preference relationships which affect choice among short term and long options. Assigned value is the expressed relative importance or worth of an object to an individual or group in a given context. Any assigned value reflects to some degree the perception and held values of the valuator(s), and depends on and applies to the extent to which it relates (Brown 1984:236).

The appropriateness of an assigned value for use in a resource allocation decision depends on the degree to which its use in the decision enhances the resource owner's welfare. The more the owner's welfare is enhanced, the more appropriate is the assigned value. This is applicable whether the owner is an individual and the resource is exclusively owned or whether the owner is a group and the resource is nonexclusive. Nonexclusive property rights are considered either legally or in effect communally owned. There are two situations in which an assigned value is clearly appropriate. First is where one uses one's own assigned values in allocating one's own resources. Second is where the assigned value of individual A is used in a decision allocating B's resources, but where A and B have identical held values and corresponding preferences. Where assigned value of A is used in a decision allocating B's resources, and where A and B do not have identical held values and preferences, the assigned value may be quite inappropriate. However, the situation where the assigner of value and resource owner is different entities is often inevitable (Brown 1984:237).

In fact, decision regarding the allocation of a group's resources is always based on the assigned values of individuals. When the resource owner is a group, for example society, and where the assigned values of individuals in the group are being used by managers responsible to the group in allocating the group's resource, this leads to problems of appropriateness (Brown 1984:238). Economic value is a set of context-specific assigned values.

## THEORETICAL COMPARISONS: TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) AND WESTERN SCIENCE

Although western science has dismissive attitude towards traditional ecological knowledge, it has generated curiosity in the era of change. The western science view has been observed by Johannes (1989:5) that "the attitudes of many biological scientists and natural resource managers to traditional knowledge have frequently been dismissive." In general, TEK differs from scientific ecological knowledge in a number of substantive ways: it is mainly qualitative while western science is quantitative; TEK has an intuitive component while western science is purely rational; TEK is holistic while western science is reductionist; TEK considers mind and matter co-exist while western science considers mind and matter as separate; TEK is moral while western science is value-free; TEK is spiritual while western science is mechanistic; TEK is based on empirical observations and accumulation of facts by trial-and-error while western science is based on experimentation and systematic, deliberate accumulation of fact; TEK is based on data generated by resource users themselves while western science data is generated by specialized cadre of researchers; and TEK is based on diachronic data. That is, long time-series of information on one locality as opposed to western science where data is based on synchronic data. That is, short time-series over a large area.

Table 2: Indigenous knowledge and western science comparison

| Comparable variable | Indigenous knowledge | Western scientific knowledge |
|---|---|---|
| **Relationship** | Subordinate | Dominant |
| **Dominant mode of thinking** | Intuitive (holistic) | Analytical (reductionist) |
| **Communication** | Oral (storytelling, subjective experiential) | Literate/didactic (academic, objective, positivist) |
| **Data creation** | Slow/inconclusive | Fast/selective |
| **Prediction** | Short-term cycles (recognize the onset of long-term cycles) | Short-term linear (poor long-term analysis) |
| **Explanation** | Spiritual (the inexplicable) | Scientific inquiry (hypothesis, laws) |
| **Biological classification** | Ecological (inconclusive, internally differentiating) | Genetic and hierarchical (differentiating) |

Source: Wolfe et al. 1991, also cited in Lalonde 1993, p.57

A major way in which TEK may be further distinguished from science ecology concerns the large social context of TEK. TEK is not merely a system of Knowledge, practice and beliefs, but through the social contexts. The social context of TEK is not limited to: 1) symbolic meaning through oral history, place name, and spiritual relationships; 2) a distinct cosmology or world views; a view of the environment difference from the western ecology; and 3) relations based on reciprocity and obligations towards both community and other beings, and communal resource management institutions based on shared knowledge and meaning (Berkes 1993:5).

Unlike the documented scientific system, much information remaining on TEK in Africa exists only in oral form, passed on from knowledgeable individuals through shared practices and storytelling. African proverb states that "when a knowledge old person dies, a whole library disappears". The death of key elders can severely limits and threatens sustainable livelihoods. Since colonialism, indigenous knowledge systems were altered, disrupted and replaced by colonial and state practices (Lalonde 1993:57).

**ENVIRONMENTAL VALUES WITHIN THE POLICY REALM:**

Based on need hierarchy of human needs, some scholars have argued that environmental concern is related to aesthetics, a "higher-order" or "post-materialist" value, and that poor people, who struggle to sustain their basic daily and material needs, cannot afford (Hunter et al. 2010). However, the notion that only rich people and nation express their environmental concerns was questioned by Brechin and Kempton (1994) on whether economic well-being precedes environmentalism. They argued that the levels of environmental concern among poor countries "challenge the conventional wisdom that people in developing countries lack environmental values" (Brechin and Kempton 1994:245). This finding raises doubt about the relationship between post-materialism and environmental concern. Inglehart (1995) also points that specific local context might not support the conventional hypothesis. Inglehart further argues that public support for environmental protection is shaped by both subjective cultural factors (post-materialist values) and objective material concerns.

Citizens of relatively poor countries are environmentally concerned because they directly experience proximate degradation while citizens of relatively wealthy countries tend to endorse environmental protection due to cultural shifts to post-material values (Brechin 1999). This explanation offers the reason for the rise in global environmentalism. Therefore, little is done to explain environmental values in diverse and complex sources across various settings. This calls for additional research to be pursued in exploring environmental concern in a various social and cultural settings. Special consideration must be given to the ways in which context and culture (through social, demographic and economic factors) shape environmental perceptions and concern. This study discusses how social context and cultural factors shape environmental values in Acholi Sub Region of Northern Uganda.

What influences Environmental Concern? Cultural and geographical contexts shape environmental orientations (Harris 2005; Schelhas and Pfeffer 2005). Harris (2005) noted that China's long history of poverty and deprivation has made them to value economic development at the expense of environmental protection to accumulate material wealth and consumption. On a related line of

reasoning, environmental perceptions are also influenced by international environmental discourses with emphasis on eco-tourism and conservation. The combination of local and global environmental discourses results into a unique blend of environmental perceptions and beliefs that legitimizes both forest conservation and resource dependent activities (Schelhas and Pfeffer 2005:12). While environmental activism and action have increased globally, it has not resulted in homogenous global environmental values, but rather, distinct environmental beliefs and perceptions socially constructed in different settings. As further suggested by Schelhas and Pfeffer (2005), there is little information on local research that examines environmental beliefs and perceptions as constructed in one particular setting.

Decision-making process within the context of natural resource management focuses on the conventional approach to natural resource management with a clearly defined steps including: creating a goal statement; assessing problems and opportunities for achieving the goal; identification of ways to solve problems, selecting the best alternative and lastly implementation. The concern in this approach is that, it is a top-down approach, which often excludes the knowledge, preferences and values of the affected people or concerned by the outcome (Groot and Maarleveld 2002; Long and Long 1992).

Matter on how to explicitly express environmental values for policy makers have receive more attention, with much attention towards using economic approaches to express values. However, this has attracted criticisms on the appropriateness in articulating the wide range of environmental values. The main issue in the literature on environmental values is how to compare diverse and differing values, including different types of values and how to articulate those values in ways that are useful for policy makers (Lockwood 1999). Additionally, economic approach to describing values does not differentiate between held values and assigned values. Held Values are principles and ideas that are important to people. They include modes of behavior (e.g. bravery, compassion), end states (e.g. liberty, happiness), and desirable qualities (e.g. justice, happiness). However, assigned values are values we attached to things (Lockwood 1999). In fact, economic values cannot represent all values. They are only subset of assigned values which are subset of larger class values (*Brown 1984)*. The powerful influence of economic approaches of valuing mainly direct attention to think and make decisions in economic terms, even when their own values are intrinsic, non economic in nature (Robinson 2011:5).

Are there universal environmental values? Studies found that people in diverse settings have value for the environment but for different reasons (Miller 2006). Environment is universal human values (Nussbaum 1999), a belief in the intrinsic values of nature. Environmental values can be powerful motivating forces (Upholff and Langholz 1998). The common ground that exists between local and external values and priorities represents a resource that conservation agencies do not take advantage of (Vermeulen 2007).

Another aspect of this study is about value formation. The economic approaches are criticized because they treat values and interests as given. There is little work done in the process of value formation and the input to environmental governance (Miller 2006; Robinson 2011). This study examines the process of value formation and the processes of governance in relations to environmental values in Acholiland. Apart from recognizing the different types of values, it is important to consider how different values relate to each other and to other factors such as knowledge and social norms, and how they affect behavior (Robinson 2011; Lockwood 1999). As noted by Brown (1984) and Lockwood (1999), held values are deeper and more stable and form the basis for assigned values. Held values help to direct values. Lockwood (1999) proposes a model of value formation and behavior showing the causal relationship from the social context of held values, together form an overall value orientation, to cognitions (understandings) and assigned values, to intentions, and finally behavior. Given the fact that governance is a social function, taking place in the realm of relationship between actors, understating how decisions are deliberated and negotiated, in relations to interests and positions are also important. Robinson added the interests and positions to Lockwood's model. The causal relationship is strongest between elements closer to each other.

Given the variety of contextual factors that can have an influence on behavior, which is downward, the movement from held values through values orientation to interests and positions is usually in the direction of increasing particularity and diversity. If you focus on identifying values that are more clearly articulated, then it is predestined to emphasize assigned values over held values, and thus, to see diversity. However, the relationship between different types of values, the way values are formed, and the similarity across cultures of certain held values are all critically important for the aspects of governance that involve mediating diverse and sometimes opposing values and finding commonality

in values for the setting of collective direction. In the case of collective decision-

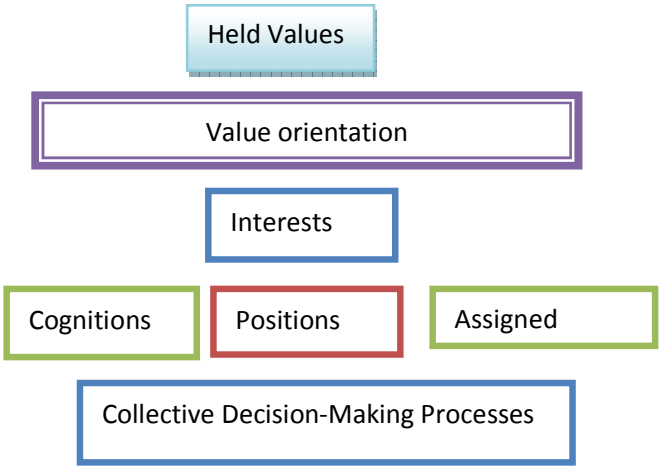



Figure 1: Individual Values, interests and positions in relation to collective decision-making processes

making, parties may have positions and interests that are, or seem, dramatically opposed, even when many of the held values may be very similar. Furthermore, it was found that some types of fundamental values are ignored in collective decision-making processes, especially in government conservation agencies. The spaces in which communities can discuss and deliberate on the fundamental held values with other decision-makers are extremely limited. Government decision makers are not concerned about justice. More powerful actors do not seem to recognize that local residents care about the environment and would wish for their children and grandchildren to continue to experience the beauty of nature (Robinson 2011:12-13). The behavioral model measures individualistic values, which are also social construction. What further deserves research attention is the role governance plays in social processes of value formation, using the methodology of appreciative inquiry.

**PRACTICAL SIGNIFICANCE OF TEK: AFRICAN REVERENCE FOR THE ENVIRONMENT**

The study in the field of indigenous knowledge in ecology is relatively recent. Indigenous environmental knowledge has come to be recognized and used by scientific experts. This has been recognized even at the international level, including the World Commission on Environment and Development. That tribal and indigenous people's ways of life can offer modern societies good lessons on how to manage complex resources like forests and ecological systems (WCED 1987:12). Studies on African ecological knowledge are relevant on the following grounds: 1) the long term generation and transmission of knowledge of the local ecosystem offers a unique historical perspective into indigenous risk adjustment options; 2) there is a growing international support and political recognition for universal human rights in development activities (Lalone 1993:55). Contributions to the field of ecological knowledge are mostly from interdisciplinary scholars than ecology and resource management professionals. The earliest systematic studies of TEK were done by anthropologists. It is the study of ethno-ecology, an approach that focuses on the conceptions of ecological relationship held by people or culture (Berkes 1993). According to Hardesty (1977:291), it is defined as "the study of systems of knowledge developed by a given culture to classify the objects, activities and events of its universe."

Ecological positive practices are based on symbolism, and involve spiritual rituals, religious practices, social taboos, and sacred animal totems. The traditional keepers and users of local ecological and wisdom are typically the elders from rural areas in Africa. The ecosystem view on many indigenous societies in Africa as reflected in the management practices encompass both individual and community wisdom and skills. Some of these management practices are not limited to indigenous soil taxonomies, indigenous knowledge for potential use of local plants and forest products, local knowledge of importance of tree species, soil and water

conservation and anti-dissertation practices (Lalonde 1993:56).

The Earth summit of the United Nations Conference on Environment and Development (UNCED) was held in June 2012, Rio de Janeiro to produce agreements and to establish specific requirements on basic principles on sustainability and sustainable future as enshrined in the Rio de Janeiro Declaration and the requirements in Agenda 21 is the recognition of indigenous knowledge, commonly referred to as the Traditional Ecological Knowledge (TEK). TEK is defined as the knowledge base acquired by indigenous and local people over many hundred years through direct contact with the environment. It is more of a holistic knowledge, or "world view" which are parallel to the scientific discipline of ecology (Inglis 1993). TEK can make a major contribution to the delivery of Agenda 21 and sustainable development. However, TEK's potential in resource and environmental management is not realized. Indigenous and local peoples have themselves lived in harmony with their environment for many hundred years and this relationship is evident in many of their activities up to today.

The development of indigenous knowledge or the application of acquired ecological knowledge is a conscious effort by both individuals and the local community to better understand and live within the dynamic carrying capacity of the local ecosystem. Although the applications of indigenous knowledge are typically taken with caution as being traditional, under some circumstances change such as local ecological and climatic conditions are drastically changing to the extent of stressing individuals and community's survival, the application may be readily acceptable. Africa is experiencing famine caused by drought, deforestation, desertification, and declining productivity. All these call for the acceptance of innovation (Lalonde 1993:56). In fact, in most fragile ecological and marginalized regions, knowledge of the local ecosystem means survivals.

Western science alone in the past provided by biological and ecological insights has influenced the knowledge base for resource management, conservation, development planning and environmental assessment. At this period of climatic change, TEK can act as a complementary approach to western science, not a replacement for it (Knudtson and Suzuki 1992). Even if TEK's importance is gradually being recognized, the dilemma remains on how to integrate TEK and scientific knowledge, given the differences in terms of values, unequal political power base, especially power sharing in decision making (Berkes 1993:6).

African ecological knowledge can facilitate sustainable natural resource management planning. This can be done through documentation and consequently gaining credibility and respect for the existing body of indigenous knowledge. Understanding indigenous knowledge within the cultural framework can help in understanding dynamics of local ecosystem. Indigenous ecological knowledge may be used to suggest project site alternatives in order to avoid negative measures to ecosystem and traditional culture (Lalonde 1993:58).
As noted by Caring for the Earth: Hunting, fishing, trapping, gathering or herding continue to be major sources of food, raw materials and incomes. Moreover, they provide native communities with a perception of themselves as distinct cultures, confirming continuity with their past and unity with the world. Such activities reinforce spiritual values, an ethic of sharing, and a commitment to stewardship of the land, based on a perspective of many generations (*IUCN/UNEP/WWF 1991:61).*

The importance of African values has gained prominent in environment conservation and biodiversity research since the 1990s. The value of indigenous knowledge in facilitating development is now gradually being recognized by governments and development agencies including UNEP and FAO. However, few studies on local perspectives have been recorded in this area. Indigenous Knowledge (IK), particularly in agricultural and environmental knowledge has gained international recognition after the United Nations Conference on Environment and Development (UNCED) held in June 1992 in Rio de Janeiro. Agenda number 21 of the environmental agreements signed at the conference emphasizes that governments and intergovernmental organizations should respect, record, and work toward incorporating indigenous knowledge systems into research and development programs for conservation of biodiversity and sustainability of agricultural and natural resource management systems. The 1980's document entitled "World Conservation Strategy" by the International Union for the Conservation of Nature and Natural Resources (IUCN), also paved the way for the recognition of the important role played by indigenous knowledge in biodiversity and human development(UNEP 2008:23).

There is a growing interest in the relevance of indigenous knowledge in managing the contemporary resource problems. As stated in our common Future: Tribal and indigenous peoples'… lifestyles can offer modern societies many lessons in the management of resources in complex forest, mountain and dry-land ecosystem (WCED 1987:12). These communities are the repositories of vast accumulations of traditional

knowledge and experience that link humanity with ancient origins. Their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems (WCED 1987:114-115). Biodiversity is now becoming synonymous with sustainable development and human survival, therefore, TEK has the potential to provide valuable information and also a useful model for resource management today. Traditional ecological Knowledge is often described as local and holistic, which integrates the physical and spiritual aspects into a world view or "cosmovision" that evolved over time and emphasizes the practical application of skills and knowledge. Traditional ecological knowledge is the product of careful observations and responses to ever changing environmental conditions and its adaptation as the key to survival. Principle 22 of the Rio Declaration on Environment and Development states that: Indigenous people and their communities and other communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and dully support their identity, culture and interests and enable their effective participation in the achievement of sustainable development[1].

In fact, traditional ecological knowledge has its origin in the ethno-biology and human ecology. It begins with the study of local species and their classification, and in the process of understanding their ecological process and relationships. However, this study is not concerned with the scientific inquiry. It is an interdisciplinary perspective, looking at it from the policy perspective of knowledge gap that has not been adequately utilized by policy makers in developing countries when it comes to decision making in natural resource management. As defined by the Convention on Biological Diversity, Article 8 (j) that: Traditional knowledge refers to the knowledge, innovations and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and it takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly practical in nature, particularly in the fields of agriculture, fisheries, health, horticulture and forestry.

Traditional ecological knowledge also viewed as a system of self management. It is a valuable source of environmental information that is useful to indigenous people or isolated native communities to protect and preserve their way of life. It forms a basis for local decision-making in the areas of agriculture, hunting and gathering, nutrition and food preparation, resource management, education and health, and also in social, economic and political organization. It links culture to biodiversity. As noted: Native land ethics teach not to take more than you need or that the land provide. More so, native ethics as care giving goes even further: if you do not use it, you lose it. Many (although not all) plant communities require disturbance to thrive. So, in the act of using plants, they are enhanced and conserved[2].

As noted in the above quote, this is relevant to many African plants which cannot thrive without disturbances unless they are disturbed in order to regenerate and revitalize their structure and function. In addition, many natural habitats are "cultural landscapes" and most wild species have been modified by human interventions. Our focus is to living with the past lifestyles which is a gone era but the point is how the past practices with regard to sustainable management can be useful in the era of climatic change.

According to Berkes (1999), traditional ecological knowledge has four interrelated levels within which it can be called as knowledge-practice-belief complex. These are: 1) knowledge based on empirical observations which are essential for survival (species taxonomies, distribution, and life cycles); 2) understanding ecological processes and natural resource management (practices, tools, and techniques); 3) socio-economic organization necessary for effective coordination and cooperation (rules and taboos) and 4) the world view or "cosmovision" (religion, belief, and ethics). This suggests the need to capture how culture is in harmony with its environment and this is possible through analysis of traditional ecological knowledge of a given social context which provides specific meaning and defines personal responsibility. This helps us in addressing the role of our value and its resilience in ecosystem management in Africa today.

United Nations Environment Programme states that environmental conservation is the conservation of natural features, including geographical and geomorphologic feature, flora and fauna. Therefore, using indigenous knowledge for conservation tends to affect all aspects of the environment[3]. For instance, in certain communities forests are designated as shrines and also considered as protected areas. These forests

have multiple functions as they also influence other elements of environment such as biodiversity, forest conservation, land use and management. Forests serve as important frontiers for regeneration of flora and reproduction of fauna. Conservation practices are vital to indigenous communities because they ensure sustainability of natural resources in order to guarantee their availability for the future generation. Similarly, conservation of plant species that are connected to mystical power are preserved through the strong mythology of 'bad thing' will happen to anyone who dares to cut them without rituals invoking the ancestral spirits. These plant species form part of the shrine forests and only the selective few in the community have access to these forests. Information on what trees could not be used was passed down from generation to generation by elders through folk stories. The forests in the shrines are highly protected and are kept intact in Africa. In this case, many communities rely wholly on the local indigenous nature reserves. For example in Kenya, communities live and cohabit with nature. Their survival depends on the sustainability of their local environment. They preserve local environmental resources with strict traditional laws that attract heavy penalty if broken. The conservation system in this case is overseen by a court of elders. In western Kenya, the Nyanyi community uses shrine to predict rain for the community. Within the shrines, there are certain plants, insects and animals, hence, indirectly contributing to biodiversity. In a similar case of western Kenya, communities such as Mfangano, Rusinga, Budalangi and Kano recognize shrines. Forests in these shrines have continuously helped rivers to flow throughout due to reduction in the rate of evaporation. For example, River Chalua in Mfangano Island, which flows throughout the year, is still intact because of strong traditional rules and harsh punishments for those who break the rules. Indigenous knowledge and practices put the management of environment and natural resource at the centre of stage of society. The environmental resource (land, water, animal and plants) are not just production factors with economic significance but also have their place within the sanctity of nature.

Africans respect for nature and its resources was based on religious attitude and practice, developed around religious thought and history of a particular social group. This indirectly served other functioning of the community including shrines and initiation rite centers, taboos developed around the destruction of trees, scrubs, and sacred places. Some trees, animals, and sources of water were preserved in the name of religion. As result, Africans were in position to make a balanced ecosystem where people and nature interacted in harmony with the environment (Omari 1990:169).

It is important to explore the relevance of traditional ecological knowledge, a concept that has been missed out in the UNEP's (2011b) report on the agenda towards greening the global economy. The policy discourse towards the green economy and poverty reduction has excluded the contribution of ecological knowledge towards pristine forests conservation, instead highlighted PES and REDD schemes. Yet, there are concepts, inexpensive practices and issues in ecological knowledge that are useful in greening the economy. The conventional ecological science emphasizes quantitative analysis of relations between organisms and their environment. However, in the recent years, there has been renewed interest to encompass a more holistic vision of the earth as a system of interconnected relationships with the environment that supports them. With this comes a surge of interest in the traditional ecological knowledge as a source of valuable information on how to use and respect our natural resources. And perhaps indicatives of two things: the need for ecological insights from indigenous practices or resource use, and the need to develop a new ecological ethic and also get the wisdom of traditional knowledge holders (Berkes 1999).

For example, many African communities observe forests to serve several purposes including protecting shrines for worship and other rituals. By doing so, such protected areas in fact ended up having multiple functions because they also influence other elements of the environment, like biodiversity, forest conservation, land use and management, and so on. In western Kenya, communities had rules to protect forests associated with rivers and streams, which they recognized as shrines. This forest cover protects River Chalua in Mfangano. The forest itself was protected by strong traditional rules and prohibitions. The river is still intact, while others have disappeared where the forest cover was not protected (UNEP 2008:45).

Indigenous Knowledge practices were instrumental in forests conservation and consist of knowhow as well as rules, prohibitions and taboos, in most communities practicing forests conservation. Studies in Kenya found that farming takes place on the edges of forests, leaving the thick forests untouched. This helped protect indigenous plants in the thick forests, which take a long time to mature. It also prevented land degradation. There were also tree and plant species that were considered sacred, or as totems, or were associated with some bad omens. For those reasons, they were protected. For instance, Ficus thonningii, known locally in western Kenya as pocho,

is considered sacred by many Kenyan communities including the Embu, Kikuyu, Kipsigis, Luhyia, Luo, Maasai and Meru. The tree is not supposed to be cut down or its wood used for fuel. In Swaziland, trees such as bhubhubhu (Crotalaria capensis) and gcolokhulu (Rapanea melanonphloeos) are protected from being used as sources of building materials. In almost all the communities, there were also plants and trees that were associated with shrines and water sources that were protected (UNEP 2008:47).

In many communities, big trees were not cut for domestic purposes; only small shrubs, reeds, and grass, which regenerate quickly, were used, for example, for building houses. Among the communities in the Lake Victoria basin, aquatic plants such as papyrus reeds and water reeds commonly used in making basketry, sleeping mats, fish cages and for thatching roofs were harvested sustainably (UNEP 2008:48). But, the most notable biodiversity conservation practice was the protection of forests.

## AFRICAN TRADITIONAL KNOWLEDGE ON THE LOCAL ECOSYSTEM IN ACHOLI LAND, NORHERN UGANDA

Africans respect for nature and its resources was developed around history of a particular social groups and religious thought. For instance, in certain communities, forests are designated as shrines and also considered as protected areas. These practices are vital to local communities because they ensure sustainability of natural resources in order to guarantee their availability for the future generation. There were also taboos developed around the destruction of trees. They were in position to make a balanced ecosystem where people and nature interacted in harmony with the environment. It also noted that in many communities, big trees were not cut for domestic purposes; only small shrubs, reeds, and grass, which regenerate quickly, were used, for example, for building houses. As a result, these practices promote biodiversity conservation and protection of forests. However, all these were achieved because they have well defined rules, prohibitions, and taboos. This explained why farming was taking place on the edges of forests, leaving the thick forests untouched.

Based on information collected during oral history interviews, common answers from the respondents purport the proposition that Africans care about the environment regardless of their economic situations, contrary to the post-materialistic world that views environmentalism as a version of the rich class and nation. In fact, the Acholi of Northern Uganda has a deep value for the environment. Sacred forests are named after great ancestors, who are believed to be the care takers. Entrance and uses of these forests are limited to few elders. Tree cutting areas are demarcated in specific locations and no one can cut trees from these areas. Taboos prevent peoples from using certain trees because they will bring them bad omen. Some of these trees such as “Yaa”, “odwong”, “Kituba,” “Beyo”, “Ogango” to mentioned, but a few; were not cut for any other purposes such as building materials and firewood. Building materials were collected from trees without big canopies such Bamboos for roofing and in some areas for making the wall. Most interestingly was that trees with big canopies were not used for either firewood or building construction, it was only trees without big canopies that were cut down for whatever purposes.

Wild trees are very much respected, and conserved, especially those with big canopies and those offering social and economic benefits. Sheer butter, ‘Yaa’– a wild tree serves both for economic and social purposes. Cutting ‘Yaa’ was prohibited because it serves multiple functions. It is a source of oil and income to rural communities. ‘Beyo’ – a hard wood tree is most respected because of its spiritual linkage. However, with population increase and increasing demand for charcoal, ‘Yaa’ are being cut world for making charcoal while ‘beyo’ that used not to be cut, are now being targeted for commercial purposes - for timbers and charcoal. Timber dealers are often licensed by local authorities to cut down trees for commercial purposes.

The preservation of TEK is important for social and cultural reasons. TEK provides a valuable way of life that is important for managing our environment in the era of climatic change. It is relevant for preserving our cultural biodiversity. This study emphasizes the importance of integrating TEK into the contemporary management of natural resource and suggests for its use in planning and conservation education of our environment and government must take this knowledge seriously. However, the challenge of using indigenous knowledge is that communities have no way of keeping track of stocks or assessing the sustainability of usage of forest resources and the changing knowledge in respect to habitats.

## CONCLUSIONS

This study emphasizes the importance of integrating TEK into contemporary management of natural resources and suggests for its use in planning and conservation education of our environment, a suggestion government should considered as very important. As one of the way forward for the new solutions, African environmental values and ecological knowledge should be considered by the policy makers as one of the post Rio 20 + solutions to

climatic change mitigation and adaption. Policy makers promoting capitalist interests in a poor country can incorporate local interests and held value in environmentalism. As we look for new adaptation and mitigation measures, the ecological knowledge of Africans should be utilized since it is not costly and does not need the application of western technology.

In seeking for solutions to global environmental problems, an African environmental values offered alternative for Sub Saharan Africa, sharing the view on natural environment as a cultural heritage in achieving a sustainable development. It is a valuable way of life for managing our common future in the era of climatic change. The policy challenges in implementing TEK, however, still remain a big debate within the policy circles. This is because TEK is passed from generation to generation through folk stories, and there is no written record. The challenge of using TEK is that communities have no way of keeping track of stocks or assessing the sustainability of usage of forest resources and the changing knowledge in respect to the habitats. It is only being recognized at the international level, but its application for local environmental management lacks the attention of bureaucrats in poor countries.

This is because governments in developing countries are focusing more on the revenue side of the story, allowing the rights to resource exploitation to those who have been licensed to cut down forests while telling the poor communities who have been preserving their surroundings not to cut trees, simply because they have no licenses to do so. The argument is that forest management does not talk about traditional ways of forests preservation as one of the key elements to be included in biodiversity education. The focus is on tree planting, yet in the actual sense, people rarely plant trees if it is for environmental purposes in areas where big native trees exist.

**End Note**

[1]Society for Ecological Restoration International: Traditional Ecological Knowledge. Available at http://www.ser.org/iprn/tek.asp

[2]ibid [1]

[3]United Nations Environment Programme, environment for development: indigenous knowledge in Africa. Available at http://www.unep.org/ik/

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