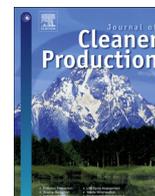




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## Environmental ethics and future oriented transformation to sustainability in Sub-Saharan Africa

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## ABSTRACT

The current study underscores the importance of environmental ethics as a vehicle for engaging society, businesses, and policy-makers towards mainstreaming transformation to sustainability. This reflects an innovative trend towards using narratives in social and management sciences, which needs to be replicated by other disciplines, organisations, agencies, and social groupings. In this paper, focus is on identifying storylines, phrases, myths, and local and indigenous knowledge systems of ethical and ecological significance. Using examples from written and unwritten narratives of Hausa – one of the widely spoken languages in sub-Saharan Africa, this study shines light on some key narratives relevant to present day critical environmental issues such as management of agricultural landscapes, municipal waste, ecosystem services, integrated natural resource management, and biodiversity loss. Environmental ethics drawn from the narratives provide an integrated platform where formal and informal institutions of sustainability can be strengthened, supporting transformation towards sustainability through enhancing ecological consciousness, skills, and attitudes.

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### 1. Introduction

The current global campaigns for transformation to sustainability are handicapped by gaps in existing knowledge systems that leave out essential elements for engaging society and policy (Rauschmayer et al., 2015). A key challenge, therefore, is to identify innovative and practical pathways that can address the seemingly inexorable trends in global environmental change. Currently, humanity is challenged to keep the Earth within safe limits of the nine planetary boundaries (Rockström et al., 2009). To stay within a safe operating space, it is vital to explore innovative environmental-problem solving strategies (Pattberg and Widerberg, 2015). Most attention has focused on scrutinising the role of industries and businesses and their tampering with the quality of global and local ecosystems. In most instances, the footprints of big polluters are quantifiable and even prosecutable. Conversely, it remains extremely difficult to establish patterns of individuals' and households' unsustainable consumption, behaviours, and commitments

to sustainability (Gill et al., 2005; Grunert et al., 2014; Hirsh, 2014). In this context, Garrard (2007) argued that environmental solutions make more sense when they wear moral characters, as in the cases of asking the public to recycle materials, reduce travel, or switch off lights. As such, it is essential to search for innovative and people-oriented strategies that can effectively prepare people's minds to tilt towards environmentally sustainable behaviour.

Referring to the current sustainability challenges and the prospects of creative narrative-based environmental ethics, Willis (2012:58) argued that “we already have enough technical information to know what needs to be done. What seems to be lacking is practical knowledge about how we might lead good lives in the face of this challenge and the practical wisdom to make the moral commitment to do so.” Hence, creative stories, literary works, and indigenous and local knowledge could be vital sources to engage humans in this age of rapid local and global environmental change. A good example of using creative writing as an innovative tool for driving modern businesses is seen in *How Stella Saved the Farm* (Govindarajan and Trimble, 2013). The story was built around a diverse animal community and its goal is to teach business administrators the principles and skills of innovative management, creative thinking, and strategic planning. Narratives such as the *Parable of Flute* given in *The Idea of Justice* by Sen (2009) are used in

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explaining social justice theories. Creative stories such as the satirical *Animal Farm* by George Orwell show the extent to which human storytelling can go in addressing political problems. While such stories were not written for the purpose of promoting environmental ethics and sustainability, educators can contextualise and link them to the environmental ethics and sustainability causes.

Many developing countries such as those in sub-Saharan Africa have limited institutional and technical capacities to tackle sustainability and environmental ethics issues. The long-standing effects of colonisation, globalisation, and urbanisation have negatively impinged on African environmental ethics and indigenous and local knowledge systems. As an example, Neumann (2004) questioned the rationale of shoot-on-site orders against illegal hunters in many African countries who are trying to meet straitjacket international conservation obligations. However, it is crucial to state that most of the current sustainability challenges in Africa are exacerbated because of collapsing and fading indigenous and local knowledge systems and institutions. For instance, Gerber and Veuthey (2007) observed that prior to introduction of industrial forest exploitation, African communities considered forests as their cohorts, origin, destiny, source of power, wealth, health, sacredness, and security. Another serious challenge is the rising number of middle-class Africans which has recently exceeded 300 million and is often associated with anti-sustainability consumerism (McEwan et al., 2015). According to Silver (2015), urbanisation in sub-Saharan Africa is enmeshed in flawed logics and failures to comply with decarbonisation strategies. These challenges underscore the need for innovative ways to ensure sustainability thinking and environmental ethics become more embedded within people's attitudes and behaviours.

Building on and extending these examples, the current study therefore seeks to identify the prospects of environmental ethics narratives as a vehicle for engaging society, businesses, and policy-makers in the quest for sustainability. The study assumes that individuals are at the core of transformation to sustainability and hence most examples are drawn based on experiences of individuals. Our specific research question asks: how do literary works and other narratives support environmental ethics and provide a route to transformation towards sustainability? We tackle this research question by focussing on developing countries that experience dire ecological problems.

In exploring the potentials of environmental ethics in addressing the sustainability crisis, this study focuses on example narratives from Hausa speaking areas in West Africa. According to Webster (1997), narrative is present in myth, legend, fable, tale, novella, epic, history, tragedy, drama, comedy, mime, comics, news item, conversations, and is present in every age and place, and it is trans-historical, transcultural. Hence, we anticipate a countless number of narratives of ecological and ethical importance in African languages. With as many as 40 million first speakers, and twenty million second language speakers, Hausa is the second most widely spoken language in sub-Saharan Africa after Swahili (Manvell, 2012). The core Hausaland is located in Northern Nigeria and Southern Niger Republic (Fig. 1). However, pockets of Hausa speaking people or Hausa diaspora are found in Chad, Cameroon, Ghana, the Sudan, and Central African Republic and Middle East (Alidou, 2012). The importance of Hausa is observed in the ways in which media organisations such as the BBC, Voice of America, Deutschewelle, Radio France International, Radio Iran, Radio Beijing transmit programmes in the Hausa language. Similarly, some universities in the UK, US, and Germany also offer Hausa language and literature studies up to doctoral level.

This paper comprises six intertwined sections – introduction, literature review, conceptual framework, methods, results, discussion and conclusion. The introductory part of the paper presents

the rationale and urgency for using narratives to support environmental ethics and transformation to sustainability. The study exploits a wide range literature to develop its conceptual framework, perspectives, and arguments. Numerous literature sources were analyzed in addition to undertaking interviews with selected respondents. The results section identifies the potential role of narratives and environmental ethics for addressing and understanding land degradation, biodiversity conservation, municipal waste etc. The paper's discussion and conclusion underline the imperative for environmental ethics as an alternative for enhancing transformation to sustainability.

## 2. Literature review, conceptual framework and assumptions

Oliveira de Paula and Cavalcanti (2000) argue for the need to entrench alternative pathways and values that foster solidarity, fraternity, social equity and help in reversing destructive economic models that are incompatible with sustainability. As such, sustainability researchers need to shift towards exploring people's sense of purpose, responsibility, and consciousness for the environment and its vulnerability to unfettered consumerism. In a related vein, Vallance et al. (2011) observed that during the first decade of the 21st century, many social scientists conducted studies aimed at building bridges between humans and the bio-physical environment through environmentally friendly behaviours and stronger environmental ethics. Environmental ethics thus be seen as a connector.

According to Toepfer (2006), ethics lies at the heart of all human endeavours; from the foundations of human civilisation and the great religions, to the day-to-day decisions we all make in the course of our lives. By and large, environmental ethics offers a broad menu of moral frameworks that can enhance awareness and transparent communication between a wide range of environmental sustainability stakeholders (Randall, 2013). Building such awareness is not easy, and sometimes nations can run into ethical quandaries, particularly when decisions made to protect elements of the biophysical world clash with other priorities in the human world. One example of such a clash is the case of the moratorium on elephant poaching in southern Africa. This aimed to protect elephants. It was highly successful and led to an increase in elephant populations. However, it also created human-elephant conflict (UNEP, 2006), as these mega-fauna destroyed crops and undermined people's livelihoods.

Environmental ethics is closely associated with what social scientists call normative dimensions of sustainability, which is concerned with what ought to be done by all players to achieve or improve environmental sustainability (Moldan et al., 2012; Schroeder, 2014; Pattberg and Widerberg, 2015). The ethical dimension of sustainability is commonly viewed as a social sustainability issue different than the ecological and economic dimensions of sustainability (Thompson, 1996). However, researchers have recently paired ethics with normative dimensions arguing that efforts to support sustainability are rooted in ethical foundations of non-anthropocentrism, preservationism, enlightened anthropocentrism, and social justice theories drawn from both the natural and social sciences (Miller et al., 2011).

Often, the science and policy community pays more attention to the conventional principles and institutions such as national, regional or international environmental standards and multilateral protocols, neglecting socio-ecologically useful indigenous knowledge systems, including environmental ethics (Hayden, 2012). Even in developed countries, the process of knowledge generation and exchange for environmental sustainability research has continued to depend substantially on the views and opinions solicited from experts (Reed et al., 2014). This overlooks indigenous knowledge systems that can build bridges across disciplines, and traditional



**Fig. 1.** Map of areas in sub-Saharan Africa showing the distribution of Hausa speaking people. Adapted from Korea Computer Mission (KCM) [http://kcm.co.kr/bethany/p\\_maps1/8035.gif](http://kcm.co.kr/bethany/p_maps1/8035.gif).

ecological knowledge (TEK) and which can act as a useful platform to redistribute sustainability knowledge, including environmental ethics. In many cases, environmental ethics is inherent in indigenous knowledge systems, which include oral narratives and other literary devices (Webster, 1997). Indeed, one of the merits of African narratives is that a single story can be analysed in the context of a wide range of environmental and sustainability issues.

The significance of indigenous knowledge bases, in, for instance, literature, is that it is not merely a text for reading, but equally functions as an amalgam of context and performance (Healy-Ingram, 2011). Hence, it is this real and practical sense of the literature that translates into ethics that guide human behaviours and interactions with the environment. For example, using Africa to demonstrate the imperative of environmental ethics in the age of critical ecological crisis, Mazrui (2014: 262) argued that African people's low flower-loving culture has inherent environmental ethics, which he explained in the context of George Bernard Shaw's story:

George Bernard Shaw was once visited by a flower-loving aristocratic fan. The lady visitor observed that there were no flowers inside Shaw's home. "Mr. Shaw, I am surprised to see no flowers in your beautiful home. Don't you love flowers, Mr. Shaw?" Bernard Shaw responded: "Indeed I do love flowers, dear lady. I also love children. But I do not go around chopping off their heads for display in my living room!" Shaw was asserting that a genuine love of flowers required our leaving them to prosper as

plants in the soil. There is a sense in which African attitudes to flowers is organic in the same sense.

According to Estok (2011), most scholars analyse ecological narratives through textual and contextual explanations. For instance, Manvell (2012) used lexicons and vocabulary in his documentation of birds in parts of Hausaland. Using narratives to drive the message of sustainability and its ethical dimensions can be a good platform for engaging society in the development of solutions, and also as a means of demystifying sustainability jargons and ideas.

The main argument of the present study is that environmental ethics found in literary work and other narratives can be used to address multiple sustainability threats through grassroots informed actions and attitudes that contribute towards a transformation to sustainability. Indeed, in sub-Saharan Africa, some of the key threats to sustainability include biodiversity loss, climate change, environmental education, municipal waste, social inequality and urban degradation (e.g. Maconachie, 2014; Stringer et al., 2009). Considering the cost and the apparent dearth of innovative sustainable technologies in developing countries if the needs of future generations in developing countries are to be secured, it would need a strong code of environmental ethics to support transformation to sustainability.

The 2014 United Nations Population Fund UNFPA's State of World Population report described the African population as

'youthening' because in many sub-Saharan African countries the largest proportion of the population is less than 18 years (UNFPA, 2014). However, the study's conceptual framework shown in Fig. 2 can be used to engage not just schoolchildren and young adults, but also individuals within businesses, industry, media practitioners, education, and the policymaking community in the inherent environmental ethics in oral and written narratives.

This study's conceptual framework can be understood further in light of Soini and Birkeland's (2014) argument that 'storyline' can be used to demonstrate the role of culture in advancing sustainability and eco-cultural resilience discourse. Again, this is further demonstrated by the trending ecocriticism theories and notions such as the 'post-carbon social theory' and its variants such as 'post-carbon English' which some critical scholars believe should be incorporated into schools' curricula as a means of engaging and inspiring younger generations towards achieving future-oriented sustainability (Matthewman and Morgan, 2013). However, long before the emergence of these theories, scholars have tried to explain how the classical European literature is replete with the sense of ecophobia – hate of nature (Estok, 2011). Conversely, Moe (2011) observed that in American societies the sense of ecophobia and ecophilia – love of nature – exist side by side. Some commentators have explored the inherent ecophilia and ecophobia in some of Africa's award-winning novels, including Chinua Achebe's *Things Fall Apart* (Barau, 2008) and J. M. Coetzee's *Life & Times of Michael K* (Vital, 2008).

As far as reaching out to stakeholders is concerned, it is important to recognise gender dimensions of ecocriticism. Some ecofeminists have accused the Western classical literature of undervaluing environmental rights and privileges of women (Gaard, 2015). In contrast, El-Nour (2011) observed that women in Africa have played a leading role in folklore creation and storytelling, and that they use this outlet to counter patriarchal society by creating narratives that always make 'women' appear as self-sufficient, pretty, and resourceful. These assertions strengthen the argument for social scientists to engage scholarly, literary, and artistic viewpoints in order to achieve a good understanding of the human dimensions of the Anthropocene (Palsson et al., 2013).

### 3. Methods

This study analysed fictional narratives in the Hausa literature as well as selected academic works that explored ecological dimensions of narratives to determine elements of environmental ethics, indigenous and local knowledge in Hausaland. As there are countless Hausa prose and oral narratives, we applied some filters or criteria that helped us in selecting a sample of books and narratives for analysis. First, the selected books are among those recommended by the West African Examinations Council (WAEC) for Hausa literature (prose) test. Second, the chosen books are also used for Hausa language tests for national and state common entrance examinations for primary school pupils. Examination bodies have maintained most of these books for more than four decades. We cross-checked this information with six school teachers drawn from three primary and three secondary schools respectively. The teachers interviewed (via phone) were from three predominantly Hausa speaking states in Nigeria (namely Jigawa, Kano and Katsina). All six confirmed the selected books were being used for teaching in their schools and others. Given the 'youthening' population trend in Africa and the importance of the 'next generation' in tackling sustainability, use of narratives is vital for entrenching sustainability. The details of the books selected and used in this study are given in Table 1.

The stories in the selected books were cast in the fashion of people and landscapes of Hausaland, however, some were based on

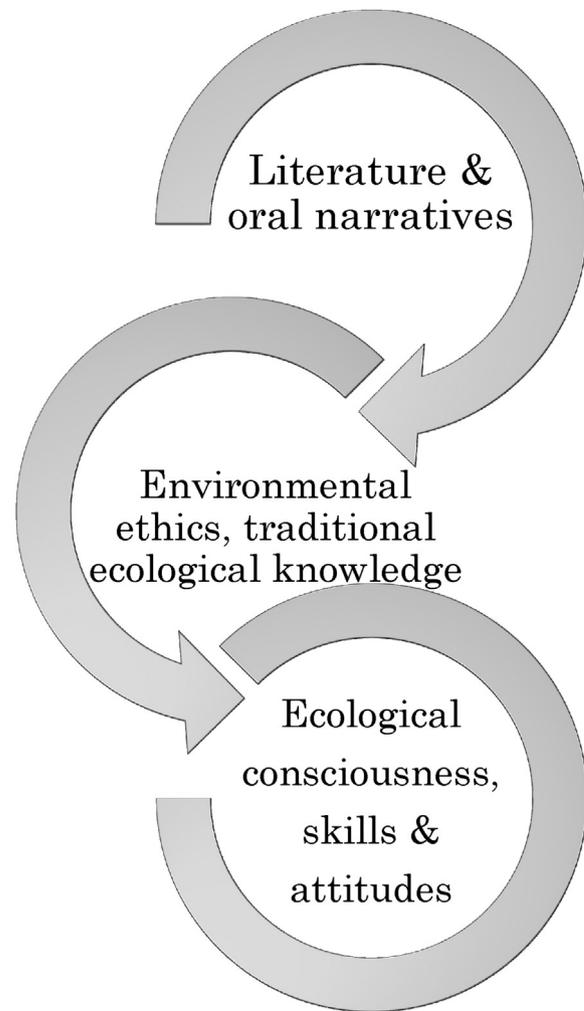


Fig. 2. Literature is a source of environmental ethics and societal values with high potentials for achieving transformation to sustainability.

adaptation of European and Arabian classical literature (Adamu, 2003). Apart from the published books listed in Table 1, we also relied on the definition of narratives by Webster (1997) to include undocumented oral narratives. Thus, following principles of autoethnography (Butz and Sebio, 2009), we identified and used what we know of the commonly used but usually undocumented narratives embedded with environmental ethics and myths such as those mentioned in Barau et al. (2013). At the same time, we searched for relevant academic literature on local knowledge and environmental change in Northern Nigeria (which is predominantly Hausa speaking area) order to identify some relevant narratives.

### 4. Results

#### 4.1. Environmental ethics and related narratives on municipal waste

An ecocritical reading of some stories unlocks some ideas, knowledge and concepts of sustainability. For instance, in the story of *Ruwan Bagaja* – the Water of Cure – by Imam (1971), a good example of waste recycling into wealth and benefits is presented. This story narrated how an outcast girl (Bora) was forced by her father to embark on an expedition to search for the mysterious

**Table 1**  
Hausa literature books used in Northern Nigerian primary and secondary schools.

Story title	Book title	Author/year/publisher
1 "Yammata Masu 'Diban 'Baure" (Girls Collecting Fig Fruit)	<i>Labarun Gargajiya</i> (Native stories)	Ibrahim Yaro Yahaya, Oxford University Press, 1974
2 <i>Zanzaro Ishara Ga Mai Lura</i> ( <i>Insect that Gives Insights to its Observer</i> )	<i>Hikayoyin Kaifafa Zukata</i> (Heart Sharpening Tales) book 1&2	Benchmark Publishers, 1979, reprint (Mambayya House, 2003)
3 <i>Ji ta Daga Dabbobbi</i> ( <i>Listen to the Animals</i> ) and <i>Borin Tinke Da Borin Tsuntsaye</i>	<i>Hikayoyin Kaifafa Zukata</i> (Heart Sharpening Tales) Volume 1&2	Benchmark Publishers, 1979, reprint (Mambayya House, 2003)
4 <i>Ruwan Bagaja</i> ( <i>The Water of Cure</i> )	<i>Ruwan Bagaja</i> ( <i>The Water of Cure</i> )	Abubakar Imam, Northern Nigeria Publishing Company, 1971
5 <i>Gwi-Da-Yara</i> (name)	<i>Labarun Gargajiya</i> (Book1)	Ibrahim Yaro Yahaya, Oxford University Press, 1974
6 Shaihu Umar (name)	Shaihu Umar	Sir Abubakar Tafawa Balewa, Longmans, 1967
7 Spider and Fig Fruit ( <i>Gizo Da 'Baure</i> )	<i>Tatsuniyoyi Da Wasanni</i> ( <i>Folklore and plays</i> ) Book 1	Ibrahim Yaro Yahaya, Oxford University Press, 1976
8 Hausa Customs	Hausa Customs	Madauci et al., 1980

*Ruwan Bagaja*. She walked alone into the wilderness. The helpless, intrepid, and hungry girl eventually reached an isolated hut where she found a dog and a severed human leg. The dog asked the girl to collect rice and bones from a nearby dumping site, wash them, and prepare some food. She did and cooked some food that nourished.

Another example is given in the story of *Gwi-Da-Yara* by Yahaya (1982) in his *Labarun Gargajiya*. Here, the story is about a polygamous family where two of the three wives were favoured and the other wife was sidelined. Since none of the three wives could be pregnant their husband sought a fertility concoction for his favoured wives and denied the other. Seeing this, the outcast wife who also yearned to bear a child resorted to scavenging. She collected the concoction already used and discarded by other wives. She used it, conceived and delivered a girl called *Gwi-Da-Yara*, who also became an outcast daughter but who ultimately emerged as benefactor of her parents after she married a wealthy man. In a way, *Gwi-Da-Yara* is an example of wealth from waste recycling. Another story – *Gizo Da 'Baure* – Spider and Fig Fruit by Yahaya (1976) shows that the price of and the prize of managing waste using innovative means could be high. In this story, the King wanted his fig orchard to be rid of rotten fig fruit in order to curb wastage. Since this task was required to be attended to in an innovative way, the King offered to marry off his daughter to any one that accomplished the task.

#### 4.2. Narratives on management of land degradation in drylands

Orally-transmitted narratives can provide useful insights into the communication of environmental problems and sustainability challenges. For example, traditional ecological knowledge is indispensable because it is through this medium that vital knowledge on resource use can be passed across the generations. In the case of drylands, some of the oral narratives are useful for understanding physical characteristics of agricultural landscape changes associated with desertification, erosion, and soil quality degradation. Maconachie (2014) documented personal communications with farmers in peri-urban Kano. Their use of selected lexicons demonstrated a good understanding of ecosystem services of local trees such as *kuka* (*Adansonia digitata*), *gawo* (*Faidherbia albida*), *tsamiya* (*Tamarindis indica*), and *marke* (*Anogeissus schimperii*). Maconachie (2014) noted a respondent who mentioned that:

The *Kuka* is excellent because it doesn't have too many leaves. But the *Tsamiya* has very broad leaves and it will make too much shade on the plot, so it is not as good for the crops. The *Gawo* tree produces fruits that animals love. So under the *Gawo*, you will see lots of animals, and they will drop their *taki* and make the soil rich. When you see the *Marke* tree, you know the land is not rich. The land around this tree becomes very hot and dry, even in the rainy season.

The above-cited also offers insights into local knowledge on land and soil quality and connections of all these to vegetation:

[T]here is a kind of grass called *Rai-rai*, which means long life. At all times of the year that grass will remain green, and its presence is a good sign. There are many types of grasses that are good, like *Kiri-kiri*, *Yadiya*, *Dodandawa*, *Tofa*, *Tsidau*, and *Yawo*. If you see these grasses growing, the soil must be strong and fertile.

... some grasses are bad.. If you see them, it signifies that the place is not good and it is degraded. Also, where there is too much *Gogamasu* it indicates that the land is bad, and crops will not grow well. If you see *Burruku* and *Duman Rafi* growing, it means that the land is too sandy and not good for crops. Wherever you see those grasses, the land is infertile because those grasses like a cold, waterlogged environment.

Policymakers and scientists need to pay attention to these kinds of narratives in designing land degradation and food security projects and policies in dryland areas. According to Abdulhamid (2006), farmers in Hausaland use certain lexicons to define the state of land with some representation of ecosystem. For instance, when they refer to soil condition as *hancin kare* (dog's nose) they simply mean a waterlogged soil.

#### 4.3. Using local knowledge for understanding local environmental conditions

One of the most critical aspects of narratives is that they serve as repositories of local knowledge on environmental systems. This is partially documented in the academic literature. For example, Abdulhamid (2006) observed that farmers rely on migration of birds – *Abdim Stork* (*Ciconia abdimi*) in particular, to predict the beginning and cessation of the rainy season in Hausaland. He also highlighted the connections between biodiversity, climate and land management, noting that the rural Hausa people predict bumper harvests when they notice the presence of many ants in their farmlands. Farmers and herdsman could also understand if their farmlands and grazing areas were infected by pests and diseases by simply sprinkling butter on a piece of land. When they cannot observe ants around the butter, they conclude that the area is not suitable for grazing. A good example of the synthesis of science, local ecological knowledge, lexicons and sociocultural narratives is given by Ahmed (1998: 150):

[O]n August, 28th 1996 the crops were stressed and farmers visited mosque to pray for rains ... luckily it rained the next day for about an hour. The highest soil moisture increase at depth of was 5 cm was recorded at sites. The farmers explained that this is bad for crops because the higher moisture level at 5 cm would

trap heat ... this raises soil temperature and adversely affects plant growth. The farmers describe this as soil fever (*zazzabi* in Hausa).

Returning to the analysis of the books in our sample, the story of *Shaihu Umar* by Tafawa-Balewa (1967) reports the journey of its principal character who travelled within diverse bioclimatic and sociocultural environments. This 'travelogue' started in towns such as Kagara, Makarfi and Zaria in the relatively wet Guinea savanna and continued into the Sudan Savanna city of Kano, moving to Kukawa village in the Sahel and eventually ended in Murzuk and Ber Kufa in the North African desert. This story is useful for engaging society in the challenges of desertification, forced migration, vulnerability and to some extent urbanisation. The depiction of the environment, towns and cities in this story (written over five decades ago) gives a window for comparison with current the situation and some insightful thoughts about the future.

#### 4.4. Ecosystem services, biodiversity knowledge and conservation

Urbanisation and land degradation are among the key drivers of ecosystem and biodiversity loss in Africa. Language barriers, policy and academic jargon may inhibit public understanding of some of these challenges. Public understanding of these issues may improve when they are presented within storylines. As an example, the story of *Yar 'Bora* (the outcast girl) by Yahaya (1982), narrates a storyline of a young girl forced by her father to go fishing in the river. The girl could not catch any fish after many attempts. By sheer luck, she eventually caught a big female fish. The mother fish appealed to the girl to release it because it has babies to take care of. The girl obliged and let it go. Because of this gesture, the girl and mother fish became good friends and the girl always received some gifts from the mother fish. Eventually, the girl's father planned to marry off the girl to a mentally challenged prince who had previously killed his wives. Upon hearing about this plan, the girl visited the mother fish for advice. The mother fish gave the girl a medicine that the girl used to cure the prince, and the girl eventually became a princess. The lesson from this story is that there is great reward in protecting key species.

Knowledge of the interconnectedness of ecosystems can also be understood from Yahaya's (1982) story: *Yammata Masu 'Diban 'Baure* (the Girls Collecting Fig Fruit). In this story, a girl and her friends go to the bush to get some figs in order to help relieve her mother who was undergoing birth labour. However, the girls realised that in order to get the fruit, they would have to search for the rain (*ruwa*) in order to grow a grain (*tsaba*), which would grow to become a stalk (*karmami*), which a cow would (*saniya*) eat to produce droppings (*kashin saniya*) which fertilise the fig tree (*bishiyar baure*) in order for it to bear the fig fruit (*baure*). The story illustrates an ecosystem and demonstrates the importance of flows, food-webs and the different roles of different components of the system.

Folk tales can also be used in educating children and young adults (including those residing in slums and rapidly urbanising towns in developing countries) about bird species that they no longer see in cities and towns. As an example, the two volumes of *Hikayoyin Kaifafa Zukata* (Heart Sharpening Tales) by Aminu-Kano (2003a,b) illustrate a vibrant community of many bird species in Hausaland. The sheer number of birds' names can be used to help sensitise people about endangered and lost species. Similarly, the personification of birds in these stories also shows that they are also communities that live life in a similar way to humans.

#### 4.5. Traditional environmental etiquette and normative dimensions of sustainability

Normative dimensions of sustainability emphasize what individuals, groups and institutions ought to do to support and strengthen sustainability. Some of the Hausa narratives and traditional beliefs and superstitions have supported sustainable resource use. Some etiquettes, taboos, ethos and superstitions are narratives that continue to make some impacts in traditional societies of the global south and also shape their institutions of sustainability. Such narratives in Hausaland help to restrain human excesses within communities. For example, it is widely believed that some trees like baobab (*kuka*), *T. indica* (*tsamiya*) serve as abodes for spirits (*aljanu/iska*). Hence, people in rural areas believing in such narratives let these trees grow, both for their economic uses and the fear of their supernatural powers. Other environmentally-conscious common superstitions in Hausaland documented by Madauci et al. (1980) in a compilation book of Hausa customs include:

- If you spit on the ground and fail to cover the spit, should someone walk over it, you will suffer from a sore throat;
- Groundnut shells must not be left lying around the house; if they are, they will attract scorpions to the house;
- A person who touches the eggs of a vulture will be bitten by a snake;
- Standing under a baobab tree at midday will bring about madness.

#### 4.6. Integration of environmental ethics into social culture: reflections on our experiences

In our literature review, we raised the issue of changing consumption patterns and resource use due to colonisation, urbanisation and the increasing number of African middle class. Environmental ethics inherent in the narratives of Hausaland can play an important role in nurturing a sense of responsibility through elements of ecophobia and ecophilia. For instance, a typical format for greeting in Hausaland when rainstorm wreaks havoc is *yaya ruwa?* (how was the rain?) and the typical response is *ruwa yayi gyara* (the rain has fixed everything). People do not refer to the work of nature as 'destruction' but rather they see it positively, as an act of construction. Our experience has shown that when some women spill hot water they cry out: "sorry to the people of the underground". This implies an apology to either spirits or the dead. It is not a mere apology per se but more of a fear of scalding invisible beings that can decide to take revenge. We also recall some of the repeated narratives told to children. For example, they are not to sit on doorsteps for fear of the invisible beings that may want to pass. Another common story in Hausaland is about a child that urinated under the shade of a tree, and an invisible baby cried out to his mother for help, who in turn paralysed the boy. These kinds of stories instill fear in children and people who believe in such narratives. Such fears could be advantageous to trees and other elements of the ecosystem, either directly or indirectly.

## 5. Discussion

This section revisits the study research question, moving beyond our analysis of the narratives to examine how they may be used to inform transformation to sustainability in both sub-Saharan Africa and developing countries more broadly.

### 5.1. Integrating environmental ethics and traditional knowledge narratives in the sustainability agenda

The stories we have analysed are well-known to schoolchildren and adults that have attended either primary or secondary school in the last four to five decades. Our study has contextualized and explored ecological and ethical dimensions of local narratives and stories. Since, such narratives originate and thrive in local communities the greening of such narratives and their integration into formal sustainability agenda enhances chances of community engagement. In order to widen the scope of public engagement and participation in promoting sustainability, it is crucial to find the means of mainstreaming the pro-sustainability messages present in the narratives. Indeed, folklore and storytelling is one area where African women excel their male counterparts (El-Nour, 2011). As such, greening of stories is an important opportunity for enhancing women's and children's participation in national and local sustainability programmes in many other countries.

By revealing the unlimited ecological significance of narratives and environmental ethics, this study is contributing towards reorienting some of the views held by international development institutions about traditional resource use practices in developing countries. For instance, there are researchers that blame certain indigenous agricultural practices for deforestation and land degradation (Voss, 2007). Such a notion is nevertheless disputed by other studies that found that indigenous and small scale agricultural land use practices support have inherent pro-environmental ethics and benign adaptive skills for long-term, fair, inclusive and socially sound resource management (Mortimore and Adams, 2001; Stringer et al., 2009). Besides, the experiences of some communities has shown that environmental narratives are part of institutions' bridge between society, ecosystems, rights to access to natural resources (Barau and Stringer, 2015). As such, it is high time for policymakers and decision-makers to enhance their building effort in order to progress the documentation of such practices as a means of expediting transformation to sustainability.

### 5.2. Environmental ethics and transformation to sustainability

Most of the current sustainability challenges emerge from actions and careless exploitation of natural resources by individuals or groups. Most of the works analysed in this study point to the timeless dimensions of narratives and their intergenerational influences on public behaviour and attitudes. Hence, it is possible to say that such narratives can be used by formal environmental institutions and organizations to support streamlining environmental ethics as basis for transformation to sustainability. Environmental ethics offers alternative thoughts and ideas for addressing the 21st century environmental challenges (Oliveira de Paula and Cavalcanti, 2000). Indeed, environmental ethics is not an option but necessary in informing transformations to sustainability. According to Berkes (2008), environmental ethics emanating from narratives and traditional knowledge systems help to foster transformation to sustainability through reintegrating humans back into ecosystem and restoring of unity of mind and nature. The consequences of the restoration of human and nature relationships can enhance love and respect for the nature and human wellbeing.

Fortunately, more researchers are making clarion calls to prioritise the normative dimensions of sustainability, including issues relating to equity and fairness in society (Moldan et al., 2012; Schroeder, 2014; Pattberg and Widerberg, 2015). However, equity and fairness can only be established within society when principles of justice and fair play are nurtured through the notion of environmental ethics. In other words, and supported by our findings, equality, equity and fairness are components of environmental

ethics derivable from narratives of traditional societies and local knowledge systems.

In regards to how narratives facilitate transformation to sustainability, it is important to stress that greening of literature and extracting of environmental ethics is only one level of action. According to the UN General Assembly Report on the post-2015 development agenda, the transformational approach plays a key role where the target is employing technological innovations to drive sustainability (United Nations, 2014). Indeed, Willis (2012) noted there is enough technical information on what to do to address global environmental crises. Hence, environmental narratives should be seen as one of the core social science innovations that can support, improve and transform the environmental ethics and sustainability understandings of individuals engaged in policy-making, business and academic sectors. This is in view of the success of some recent works that applied folklore and other creative narratives to advance critical and strategic thinking in business administration and social justice theory (Sen, 2009; Govindarajan and Trimble, 2013).

Although the focus of this paper is on the narratives of Hausa literature, it is important to note that the lessons or messages of sustainability inherent in the stories used for this study are of global relevance and importance. Indeed, some scholars consider that some of the narratives of Hausaland originated from other parts of Africa, Arabia and Europe (Adamu, 2003; Alidou, 2012). This suggests that narratives have wide appeal and transcendent values. By linking the origin of Hausa literature resources to other cultures and geographies, Webster's (1997) notion that narratives are transnational, transcultural and transhistorical is supported. In other words, policymakers and educators have a useful opportunity to explore stories or narratives with potential value to foster ecological consciousness and environmental ethics. Such efforts become increasingly important in view of the current fragmented nature of global and regional sustainable development strategies (Rauschmayer et al., 2015). Driving forward the transformation to sustainability will benefit significantly from exploring environmental ethics from narratives including those used by generation of farmers in managing agricultural landscapes.

The future of global sustainable development governance lies within the attitudes and skills available to children and the youth in all countries and regions globally. Given the 'youthening' population of sub-Saharan Africa, any attempt to improve public attitudes and awareness on sustainability should principally target youths (UNFPA, 2014). Another important target group is that of the youthful entrepreneurs who are transitioning into middle class stratum in many African emerging economies (McEwan et al., 2015). According to Chapman and Sharma (2001), the youth and schoolchildren in particular have inherent readiness to engage in pro-sustainability behaviours when they are exposed to environmental education. Therefore, narratives in all their genres and forms can be utilised to engage and motivate younger generations to support the normative dimensions of sustainability.

## 6. Conclusion

So much time and so many resources are being expended on convening meetings and drafting policies to support sustainable development. On the other hand, technologies, innovations, and institutions that support effective implementation of policies have continued to be weak or ineffective in most developing countries. This study stresses the need to seek alternative ways to diversify the means of strengthening and mainstreaming environmental ethics. In many countries and cultures, ethics are associated with informal settings, although applied ethics such as corporate ethics do exist and contribute towards sustainability. Environmental

ethics is one platform that transcends public, private, individuals, community, and gender dimensions of sustainability. This study has identified many examples of environmental ethics, which in many instances are intricately intertwined with indigenous and local knowledge. One of the main challenges for this study is the way it views environmental ethics as a holistic term that covers morals and values. The study also views narratives as vehicles that drive social values, moral, and ethics. Certainly, this assumption is contestable by those with different interpretations of norms and morals. It is further important to add that not all stories and narratives in Hausaland and other places promote environmental ethics and consciousness. For example, most folklores in Hausaland portray hyena as untrustworthy and there is a common narrative among Hausa children that when lizards nod their heads they are insulting God. Nonetheless, on average there are more stories promoting environmental ethics and consciousness, suggesting that it remains pertinent that creative literary works will continue to be good sources from which environmental ethics can be shared.

Considering the overarching local and global sustainability crises, it is imperative for intergovernmental and national agencies (including civil society groups) to consider using environmental ethics as tool for building enduring transformative pathways to sustainability. This study has made a strong case for environmental ethics as a moral obligation and has provided examples from analysis of both key examination books and the academic literature that demonstrate how environmental ethics guided pre-industrial generations' interactions with the environment. At the same time, with the use of innovative approaches going forward, it offers largely untapped potential to guide the current generation to tackle the current sustainability challenges in the interest of future generations. Finally, it is important to add that in many African societies, narratives in history, culture, creative stories, knowledge, myths and beliefs are part of the institutional arrangements that have guided the past generations' benign interactions with the environment. As such, it is critical to integrate indigenous and local knowledge into mainstream sustainability policies, ideas and initiatives. We live in a world of shared literary works where translated creative works are consumed across cultures and generations. Although this study has used environmental ethics narratives from Africa the findings are more widely applicable. In the context of environmental education, narratives are capable of influencing and transforming thoughts, and attitudes of people across the globe to align themselves towards transformation to sustainability.

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## References

- Abdulhamid, A., 2006. Traditional approaches in environmental sustainability: an alternative for African development. In: A Ph.D Seminar Presented at the Department of Geography, Bayero University, Kano.
- Adamu, A.U., 2003. Istandi, Imamanci and Bollywoodanci: media and adaptation in Hausa popular culture. In: Hausa Home Videos: Technology, Economy and Society. Proceedings of the First International Conference on Hausa Films Organised by the Centre for Hausa Cultural Studies, Kano, Nigeria.
- Ahmed, K., 1998. Soil moisture relationships in Dagaeri. In: Soils, Cultivars, Livelihood and Nutrient Dynamics in Semi Arid Northern Nigeria. Department of International Development, London.
- Alidou, O., 2012. The emergence of written Hausa literature. In: Abiola Irele, F., Gikandi, Simon (Eds.), *The Cambridge History of African and Caribbean Literature*, first ed. Cambridge University Press, pp. 329–356.
- Aminu-Kano, M., 2003a. *Hikayoyin Kaifafa Zukata (Littafi Na 'Daya)*. Benchmark Publishers, Kano.
- Aminu-Kano, M., 2003b. *Hikayoyin Kaifafa Zukata (Littafi Na Biyu)*. Benchmark Publishers, Kano.

- Barau, A.S., 2008. Bridge-building between literature and environmental values of Africa: lessons from things fall apart. In: Ushie, J., Abdullahi, D. (Eds.), *Themes Fall Apart but the Centre Holds*. Association of Nigerian Authors, Abuja, pp. 92–105.
- Barau, A.S., Stringer, L.C., 2015. Access to and allocation of ecosystem services in Malaysia's Pulau Kuku Ramsar Site. *Ecosyst. Serv.* <http://dx.doi.org/10.1016/j.ecoser.2015.10.021i>.
- Barau, A.S., Ludin, A.N.M., Said, I., 2013. Socio-ecological systems and biodiversity conservation in African city: insights from Kano Emir's Palace gardens. *Urban Ecosyst.* <http://dx.doi.org/10.1007/s11252-012-0276-x>.
- Berkes, F., 2008. *Sacred Ecology*, second ed. Routledge, New York.
- Butz, D., Besio, K., 2009. Autoethnography. *Geogr. Compass* 3 (5), 1660–1674.
- Chapman, D., Sharma, K., 2001. Environmental attitudes and behaviour of primary and secondary students in Asian cities: an overview strategy for implementing an eco-schools programme. *Environmentalist* 21 (4), 265–272.
- El-Nour, E.A., 2011. Not just a pretty face: women as storytellers and subjects in the folktales of Northern Sudan. *Tydskr. Vir. Lett.* 48, 2.
- Estok, S.C., 2011. *Ecocriticism and Shakespeare: Reading Ecophobia*. Palgrave Macmillan, New York.
- Gaard, G., 2015. Ecofeminism and climate change. *Women's Stud. Int. Forum* 49, 20–33.
- Garrard, G., 2007. Ecocriticism and education for sustainability. *Pedagogy* 7 (3), 359–383.
- Gerber, J.-F., Veuthey, S., 2007. Ecological conflicts in southern Cameroon from a classical institutionalist perspective. In: Kluvankova-Oravska, T., Chobotova, V., Jilkova, J., Sauer, P. (Eds.), *Institutional Analysis of Sustainability Problems*. Slovak Academy of Sciences, Slovak.
- Gilg, A., Barr, S., Ford, N., 2005. Green consumption or sustainable lifestyles? Identifying the sustainable consumer. *Futures* 37 (6), 481–504.
- Govindarajan, V., Trimble, C., 2013. *How Stella Saved the Farm: a Tale about Making Innovation Happen*. St. Martin's Press, New York.
- Grunert, K.G., Hieke, S., Wills, J., 2014. Sustainability labels on food products: consumer motivation, understanding and use. *Food Policy* 44, 177–189.
- Hayden, C., 2012. Rethinking reductionism, or, the transformative work of making the same. *Anthropol. Forum J. Soc. Anthropol. Comp. Sociol.* 22 (3), 271–283.
- Healy-Ingram, A., 2011. Teaching indigenous literature: an ethics of voice. In: Doecke, B., Davies, L.M., Mead, P. (Eds.), *Teaching Australian Literature: From Classroom Conversations to National Imaginings*. Wakefield Press.
- Hirsh, J.B., 2014. Environmental sustainability and national personality. *J. Environ. Psychol.* 38, 233–240.
- Imam, A., 1971. *Ruwan Bagaja*. Northern Nigeria Publishing Company, Zaria.
- Maconachie, R., 2014. Urban pressure and tree cover change. In: Tanko, A.I., Momale, S.B. (Eds.), *Kano: Environment, Society and Development*. Adonis and Abbey, London, U. K., pp. 443–478.
- Madauci, Ibrahim, Isa, Yahaya, Daura, Bello, 1980. *Hausa Customs*. NNPC, Zaria, pp. 85–91.
- Manvell, A., 2012. A Preliminary Hausa Bird Lexicon. Version 1.1. <http://adammanvell.info/sites/default/files/pdfs/Manvell%20%282012%29%20A%20Preliminary%20Hausa%20Bird%20Lexicon.pdf>.
- Matthewman, S., Morgan, J., 2013. The post-carbon challenge for curriculum subjects. *Int. J. Educ. Res.* 61, 93–100.
- Mazrui, A., 2014. The floral gap in African culture. In: Badran, R., Adem, S., Dikiri, P. (Eds.), *African Thought in Comparative Perspective* by Ali Mazrui. Cambridge Scholars Publishing, Newcastle upon Tyne.
- McEwan, C., Hughes, A., Bek, D., 2015. Theorising middle class consumption from the global South: a study of everyday ethics in South Africa's Western Cape. *Geoforum.* <http://dx.doi.org/10.1016/j.geoforum.2015.02.011>.
- Miller, T.R., Minter, B.A., Malan, L.-C., 2011. The new conservation debate: the view from practical ethics. *Biol. Conserv.* 144 (3), 948–957.
- Moe, A., 2011. Trees, ecophilia, & ecophobia: a look at arboriculture along the front range cities of Colorado. *J. Ecocriticism* 3 (2), 72–82.
- Moldan, B., Janoušková, S., Hák, T., 2012. How to understand and measure environmental sustainability: indicators and targets. *Ecol. Indic.* 17, 4–13.
- Mortimore, M.J., Adams, W.M., 2001. Farmer adaptation, change and crisis in the Sahel. *Glob. Environ. Change* 11, 49–57.
- Neumann, R.P., 2004. Moral and discursive geographies in the war for biodiversity in Africa. *Polit. Geogr.* 23 (7), 813–837.
- Oliveira de Paula, G., Cavalcanti, R.N., 2000. Ethics: essence for sustainability. *J. Clean. Prod.* 8 (2), 109–117.
- Palsson, G., et al., 2013. Reconceptualizing the 'Anthropos' in the Anthropocene: integrating the social sciences and humanities in global environmental change research. *Environ. Sci. Policy* 28, 3–13.
- Pattberg, P., Widerberg, O., 2015. Theorising global environmental governance: key findings and future questions. *Millenn. J. Int. Stud.* 43 (2), 684–705.
- Randall, A., 2013. Environmental ethics for environmental economists. In: Shogren, Jason F. (Ed.), *Encyclopedia of Energy, Natural Resource, and Environmental Economics*. Elsevier, Waltham.
- Rauschmayer, F., Bauler, T., Schäpke, N., 2015. Towards a thick understanding of sustainability transitions — linking transition management, capabilities and social practices. *Ecol. Econ.* 109, 211–221.
- Reed, M.S., Stringer, L.C., Fazey, I., Evely, A.C., Kruijssen, J.H.J., 2014. Five principles for the practice of knowledge exchange in environmental management. *J. Environ. Manag.* 146, 337–345.
- Rockström, J., et al., 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecol. Soc.* 14 (2), 32.

- Schroeder, H., 2014. Governing access and allocation in the anthropocene. *Glob. Environ. Change* 26, A1–A3.
- Sen, A., 2009. *The Idea of Justice*. The Belknap Press of Harvard University Press, Cambridge, Massachusetts.
- Silver, J., 2015. The potentials of carbon markets for infrastructure investment in sub-Saharan urban Africa. *Curr. Opin. Environ. Sustain.* 13, 25–31.
- Soini, K., Birkeland, I., 2014. Exploring the scientific discourse on cultural sustainability. *Geoforum* 51, 213–223.
- Stringer, L.C., et al., 2009. Adaptations to climate change, drought and desertification: local insights to enhance policy in southern Africa. *Environ. Sci. Policy* 12 (7), 748–765.
- Tafawa-Balewa, A., 1967. Shaihu Umar. Northern Nigerian Printing Corporation, Zaria.
- Thompson, P.B., 1996. Sustainability as a norm. *Soc. Philos. Technol.* 2, 2.
- Toepfer, K., 2006. In 'Foreword' to *Environmental Education, Ethics and Action. Getting Started*. UNEP/Showick.
- UNEP, 2006. *Environmental Education, Ethics and Action. Getting Started*. UNEP/Showick.
- UNFPA, 2014. *The Power of 1.8 Billion Adolescents, Youth, and the Transformation of the Future*. UNFPA State of World Population 2014. UNFPA, New York.
- United Nations, 2014. *The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet*. Sixty-ninth session Agenda items 13 (a) and 115.
- Vallance, S., Perkins, H.C., Dixon, J.E., 2011. What is social sustainability? A clarification of concepts. *Geoforum* 42 (3), 342–348.
- Vital, A., 2008. Toward an African ecocriticism: postcolonialism, ecology and life & times of Michael, K. *Res. Afr. Literat.* 39 (1), 87–121.
- Voss, J., 2007. Foreword. In: Cairns, M. (Ed.), *Voices from the Forest Integrating Indigenous Knowledge into Sustainable Upland Farming*. Resources for Future, Washington DC.
- Webster, R., 1997. *Studying Literary Theory – an Introduction* Arnold (London).
- Willis, A., 2012. Constructing a story to live by: ethics, emotions and academic practice in the context of climate change. *Emotion, Space Soc.* 5 (1), 52–59.
- Yahaya, I.Y., 1976. *Tatsuniyoyi Da Wasanni*. (Hausa Traditional Story Readers Stage IV). Oxford University, Press, Zaria.
- Yahaya, I.Y., 1982. *Labarun Gargajiya (Book 1)*. University Press Limited, Ibadan.