

Through Their Lens: The Potential of Photovoice for Documentation of Environmental Perspectives among Kenyan Teachers

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This study explores the potential of photovoice for understanding environmental perspectives of teachers in the Narok District of Kenya. The objective of this paper is to share this photo-methodology with environmental educators so they may use it as an innovative methodological tool to understand the construction of environmental perspectives. The researchers analyzed the digital images and the accompanying narratives for themes emerging for each of the key terms. The researchers utilized Critical Visual Methodology to guide the data analysis. Each photograph was coded according to its site of audiencing (including both compositionality and social modalities). The themes - shares local knowledge, documents context, documents knowledge emerged from the participants' photovoice. The researchers theorize this tool illustrated the ways in which this community valued the environment, their community, and the ways in which they conceptualize the solutions. Keywords: Photovoice, Environmental Perspectives, Photo-Methodology, Critical Visual Methodology

Introduction

“Photovoice is a method by which people can identify, represent, and enhance their community through a specific photographic technique.”

-Wang and Burris (1997, p. 369)

This study explores the potential of a digital photo-elicitation method, photovoice (Wang & Burris, 1994), for understanding environmental sustainability perspectives of teachers in the Narok District of Kenya. The objective of this paper is to share this photo-methodology with environmental educators so they may use it as an innovative methodological tool to understand the construction of environmental perspectives.

For years, teachers, scientists, and sociologists have utilized photographs as prompts for learning and understanding their surroundings. However, with the use of this photomethodology, participants take the photographs and use the pictures to describe their understanding of science concepts, which empowers them to make changes in their community (Cook & Quigley, 2013). Developed by Wang and Burris (1994), photovoice is a method by which researchers provide cameras for participants, whose voices are often marginalized, so they may document issues important to them through the use of photography. This technique also offers participants new and reflective ways to perceive their own world and the environment around them. The purpose of this paper is to describe how photovoice was adapted as an ongoing and dialogical methodological tool to encourage teachers in Kenya to document their environment. This methodological tool serves to make environmental perspectives more evident by providing a visual backdrop to the conversation, thus revealing participant development as it occurs.

Attempts to protect and preserve the environment in marginalized or disregarded locales often involve a one-way transfer of both knowledge and materials from a source in a more developed location (Na, Okada, & Fang, 2009). This situation often deteriorates into a short-term donor project, which runs the risk of little or no impact on local the environment. One of the main reasons for this risk is that the ‘solution’ to the environmental issue is not created or co-created with local knowledge and, because these solutions are necessarily entrenched in perspectives outside to local contexts, there are real and practical confines to the effectiveness. In other words, the process of creating solutions for issues faced in significantly different geopolitical and social contexts is often itself unsustainable. Significant and relevant engagement on the part of local communities in addressing local environmental difficulties is critical in the process of arriving at long-term resolutions of those issues.

Certain communities are often at risk for this subjugation. Often marginalized communities are much more likely to be exposed to a variety of environmental health hazards and environmental degradation (Bullard, 2000). Science, government, and other formal institutions play a critical role in constructing what we know and do not know about environmental situations. These formal institutions create the “knowns” and “unknowns” which eventually become part of public discourse, scientific knowledge, and political views surrounding environmental issues. Scholars (Apple, 1986; Harding, 2005; Lather, 2007) have shown that such institutionally derived discourses fail to acknowledge inequities and cultural contexts, and consequently, render entire communities invisible (Harding, 1991). This can lead to a public distrust for science (Wynne, 2001). Thus, as we embarked on a research project in Narok, Kenya surrounding environmental perspectives of teachers, we sought to employ a research methodology that positioned the participants as co-constructors of the data and knowledge.

Accordingly, we choose a methodology called photovoice, wherein participants take pictures of their surroundings and then write about those pictures to “give voice” to the photographs. This method developed by Wang and Burris (1997) was created to empower marginalized communities to make changes in their communities. The theoretical and practical basis of photovoice is based on the adaptation of Brazilian educator Paulo Freire’s methods (1970), which begins with a concern for individual development through empowerment. In Freirian terms, the photographs serve as one kind of code that mirrors everyday social, political, and economic realities that influence people’s lives. Unlike traditional documentary photography, Photovoice allows participants to document their views of the world. Rosler (1989) questions the fairness of documentary photography. She argues, “the exposé, the compassion and outrage, of documentary fueled by the dedication to reform has shaded over into combinations of exoticism, tourism, voyeurism, psychologism, and metaphysics, trophy hunting—and careerism” (p. 5). As such, photovoice attempts to counter approaches that contribute to the “othering” of marginalized communities. A classic example of this othering is Dorothea Lange’s 1938 “Migrant Mother” photograph of a Cherokee woman, Florence Thompson, and her children. This picture quickly became “the world’s most reproduced photograph,” and although it might have helped other women, Thompson did not benefit from becoming an international icon. She was quoted in the Associated Press as saying, “What good’s it doing me?” Although documentary photography has come a long way since Lange’s picture, as researchers we can still learn from the realities of voice and power within the complexities of cross-cultural research. During the study, the researchers became interested in the potentiality of this research method for understanding environmental perspectives, particularly as we studied a community in which we were not members. Therefore, purpose of this paper is to explore the potentiality of photovoice to document environmental perspectives.

Linda Smith (1999) describes a need to decolonize the Western academy that

continually privileges Western knowledge over indigenous epistemologies:

Indigenous people across the world have other stories to tell which not only question the assumed nature of those [common sense/taken for granted western academic] ideas and the practices they generate, but also serve to tell an alternative story: the history of Western research through the eyes of colonized. These counter-stories are powerful forms of resistance, which are repeated and shared across diverse indigenous communities. (p. 2)

Accordingly, the purpose of this study is to describe the adaptation of photovoice to understand its full potentiality as a research method for understanding about environmental perspectives of teachers in Narok, Kenya.

Theoretical Framework

Through the use of photovoice, we are interested in how others are viewing their world, thus we look to theories that conjecture the way people observe their surroundings. To guide our work, we lean on the work of Fyfe and Law (1988) which positions *the visual* is most fundamental of all the senses and states, “depiction, picturing, and seeing are ubiquitous features of the process by which most human beings come to know the world as it really is for them” (p. 2). In this respect, seeing often comes before words and even meaning-making. Present times are arguably ocularcentric, or visually-focused, in that visual images play a primary role in knowledge construction (Rose, 2012). As educational researchers, we acknowledge the challenges that come with heavy reliance on images as a way to construct knowledge. Therefore, we are cautious that the images used in this study do not become what Baudrillard (1988) calls a simulacrum—in which it is no longer possible to distinguish between the real and unreal—or where the picture is interpreted without context. We avoid the simulacrum by we only examining visual images solely but by having the participants take the images and write narratives about the photographs so that they are in control of the way we interpret the images. In this way, we utilize the ideas of Mitchell’s (1983) “visual culture” to describe the ways in which images are linked to language and meaning making. Thus, we are interested in how our participants view the images and not just the image itself. We are not objectifying the image but taking it as an entry point to understand the participant’s view on environment. Berger sums this idea when he stated, “we never look just at one thing, we are always looking at the relation between things and ourselves” (1972, p. 9). In this study, we continually examine the relationships between the participant, the image, and the way in which the image was produced.

Finally, because we are interpreting the images, it is critical to understand the ways in which interpretations of visual images occur. Rose (2012) posits that there are three sites at which meanings of an image are made:

1. The sites of production,
2. The site of the image itself, and
3. The site of the audience.

The *site of production* refers to the way in which the image was made. This includes the mode, by whom, for who, and why. For our study, the mode of production was the Smartphone digital camera by the community members and teachers, in order to document the way in which the participants’ conceptualize their environment and issues

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The *site of image* itself includes the composition, and visual effects. Rose states that the site of image involves the technologies used to make, edit, transmit and display the images. In our study, all of the images are digital, transmitted via email and displayed via email. The camera that the participants used did not have editing capability and therefore, the participants did not edit the images. For our study, we were limited by the size of the image that the participants could reasonably send via email. Therefore, the site of image is affected by technology. Lastly, *the site of audiencing* includes how it is interpreted, and by whom. It also includes relation to other texts, different viewing positions, how it is transmitted, circulated, and displayed. Rose also suggests that each site (production, image, and audiencing) has a set of modalities (technological, compositional, and social) that aids in understanding the images. The social modality includes the range of economic, social, and contextual relations. The compositional modality includes the content of the image. The technological modality, which includes the type of technology used to take the photographs was the same for each participant (Smartphones and email) and was not examined in this manuscript. The researchers or the participants did not edit the images. For this study, to understand the potential of photovoice for understanding environmental conceptions, we focus on the *site of audiencing* and the social and compositional modalities of this site, as those were the sites that differed for the participants' images. As noted before the sites of image and production were similar for each of the photographs.

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Methodology

The approach used in this study is a qualitative study of a Critical Visual Methodology (Rose, 2012), specifically; our principal qualitative method includes photovoice. We adapted the use of this methodology by providing the participants with Smartphones equipped with cameras and email capability. After insuring that the participants could operate the phone and had a functional email, we asked them to take email photos along with narratives that included prompts (described below in the methodology section) over an extended period of time.

Context

Kenya is home to over 42 indigenous tribes each with its own customs and language (Mwakikagile, 2007). The Narok County lies in the southern part of Rift Valley in Kenya.

The major city in the district is Narok with a population of approximately 40,000 (Central Bureau of Statistics, 2009). Narok District, endowed with such natural resources as the Mau Forest and the Maasai Mara National Reserve, faces the results of destructive environmental practices such as dredging, inadequate waste management, and air pollution which have contributed to drought and hardship in the surrounding valleys (Beeman-Cadwallader, 2012; Timberlake, 1986; United Nations Environment Programme, 2009).

Further complicating these environmental issues, is the post-colonial challenges Kenyans encounter. Colonial history dates to the 1880s from an establishment of Germany over coastal possessions and then the arrival of Imperial British East Africa Company. During the early 20th century, the central area of Kenya was settled by the British and became a wealthy farming area for coffee and tea. The settlers enforced taxes, banned the indigenous tribes from growing of coffee, and prohibited the tribes from living on the land. Unable to live in their traditional ways, the tribes relocated to the cities in attempt to survive. The tribes rebelled against the British rule resulting in large governmental changes. The Swynnerton Plan was initiated which parceled land for families. However, this land consolidation program had exploitive political intentions. In the words of the Special Commissioner for Central Province, "Thus land consolidation was to complete the work of the Emergency: to stabilize a conservative middle class, based on the loyalists; and, as confiscated land was to be thrown into the common land pool during consolidation, it was also to confirm the landlessness of the rebels" (Anderson, 2005).

Despite this, the Swynnerton plan moved forward and the land settlement plan was established. The tribes were forced to change their indigenous ways of living, as they had no land or political power. Despite this, Kenya moved towards independence in 1957, and on December 12, 1963 became independent and formed the first constitution of Kenya. It is with this post-colonial situation in mind that we designed a methodology to position the participants as collaborators in the research process who are in control of the data collection and assisted in analysis of the themes. In other words, we wanted the participants to have control over their own narrative, particularly concerning the land and resource issues that were brutally taken from them.

Participants

We selected and recruited a purposeful sample of participants from the following constituents: teachers and community leaders from a local conservancy (n=3), teachers from Mata Day School (n=11), teachers from Kwaeki Primary school (n=10), faculty from Suswa Teachers Training College (n=7), teachers from Tamoo Day School near the Maasai Mara National Preserve (n=2), and teachers from the Community School at the Maasai Mara National Preserve (n=5). The total number of participants is 38. The Mata Day School is a co-educational primary school on the campus of Narok University College. The Kwaeki Primary School is a co-educational elementary boarding school in the city of Narok. Suswa Teachers Training College trains pre-service teachers and is affiliated with NUC. Tamoo Day School is a co-educational primary day school. The community school at the Maasai Mara National Preserve is a boarding school for secondary students that train students within 1-year duration to become tour guides at the Maasai Mara conservancies. The Maasai community leaders live in the Narok area and are not affiliated with the primary day or boarding schools but rather work for a variety of conservancies in the Maasai Mara in environmental education. See table 1 for background information on the participants including pseudonym, profession, work location, and educational background.

Table 1. Participants' background information

Name	Profession	Employment Location	Educational Background
Anna	Teacher	Mata Day School	Completed PTE ¹
Bethany	Teacher	Mata Day School	Completed PTE
Nina	Teacher	Mata Day School	Completed PTE
Clara	Teacher	Mata Day School	Completed PTE
Gilda	Teacher	Mata Day School	Completed PTE
Mary	Teacher	Mata Day School	Completed PTE
Faith	Teacher	Mata Day School	Completed PTE
Paula	Head Teacher	Mata Day School	Completed PTE
Francis	Principal	Mata Day School	Masters in education
Fredrick	Teacher	Mata Day School	Completed PTE
Magda	Teacher	Mata Day School	Completed PTE
Edith	Teacher	Kwaeki Primary School	Completed PTE
Eileen	Teacher	Kwaeki Primary School	Completed PTE
Faith	Teacher	Kwaeki Primary School	Completed PTE
Suzanne	Teacher	Kwaeki Primary School	Completed PTE
Mary	Teacher	Kwaeki Primary School	Completed PTE
Norma	Teacher	Kwaeki Primary School	Completed PTE
Catherine	Teacher	Kwaeki Primary School	Completed PTE
Stephen	Principal	Kwaeki Primary School	Masters in education
Evan	Teacher	Kwaeki Primary School	Completed PTE
Stephanie	Teacher	Kwaeki Primary School	Completed PTE
Philip	Teacher	Suswa Teacher Training	Masters in tourism. Seeking PhD
Celeste	Teacher	Suswa Teacher Training	Completed STE ² - 4 years
Julian	Teacher	Suswa Teacher Training	Completed STE- 3 years
David	Teacher	Suswa Teacher Training	Completed STE-3 years
Sharon	Principal	Suswa Teacher Training	Masters in education
Timothy	Principal	Tamoo Primary	Completed STE- 3 years
Martha	Director	Conservancy	Completed PTE

¹ PTE- Primary Teacher Education which includes two-years of teacher training after secondary school.

² STE- Secondary Teacher Education which includes two tracks, either 3 or 4 years for certification

Daniel	Teacher	Tamoo Primary	Completed PTE
Seth	Principal	Community School	Masters in tourism
Matthew	Teacher	Community School	Currently in PhD program
Mark	Teacher	Community School	Masters in tourism
Annette	Teacher	Community School	Completed STE- 3 years
Daniel	Teacher	Community School	Masters in biology
Jacob	Program coordinator	Conservancy	Masters in biology
Martin	Chief/Teacher	Conservancy	Secondary school
Beth	Teacher	Community School	Masters in biology- Seeking PhD

Data Collection

The participants were engaged in the photovoice over several months—taking photographs that represented the guiding terms in this project (i.e., nature, sustainability, environment, conservation, and preservation) and wrote narratives describing the meaning of the images to them. While the research team selected the original guiding terms as a beginning to our conversation with the participants, we discussed these terms with the participants and encouraged them to view these words as starting point.

In enacting decolonizing methodologies, context shapes the questions the researcher asks (Beeman-Cadwallader, Quigley, & Yazzie-Mintz, 2012) and for this study, context also informed what the participants' named as knowledge. Swadener, Kabiru, and Njenga (2000) provide guidelines for enacting decolonizing methodologies. These guidelines encourage collaboration during all phases of study, spending a great deal of time in the cultural context—both in longer term settings and repeated visits, learning the language, making the findings available to the participants, among others. As these guidelines point out, spending a length of time in context is critical particularly as there are levers of power that need to be moved in order to listen to the stories of the people. However, because of the time restraints on both the participants and the researchers for this research study, this was not possible. Therefore, we wanted to ensure the participants had adequate time to document the terms of “environment” and “sustainability” in a way that we would still be exposed to the context that we were studying. Thus, the photovoice methodology served two purposes:

1. To allow the participants control over the types of the data/knowledge provided and
2. To allow for longer-term data collection process providing the researchers with a richer context into the area of study.

As such, in the data, the participants documented broad ideas surrounding these terms. Each participant emailed between 1 to 2 pictures and narratives a week for a total of 308 pictures. The photographs and narratives were not edited or altered in any way by the researchers.

Data Analysis

The researchers analyzed the digital images and the accompanying narratives for themes emerging for each of the key terms. This analysis does not represent a ‘final’ verdict on the meaning of the data, but is an evolving conception of the data gathered. The researchers' role in this crucial component of the Photovoice method is to facilitate

conversation, storytelling, and reflection on pictures taken by participants, and then to codify the emergent themes generated by collective discussion. As mentioned above, the purpose of this paper is to understand the potentiality of photovoice as a research method to understand environmental perspectives. Thus, researchers analyzed the digital images and the accompanying narratives for themes emerging for each of the key terms. We utilized Rose's Critical Visual Methodology to guide our analysis (as described in the theoretical frameworks section).

Each photograph was coded according to its site of audiencing (including both compositionality and social modalities) to understand the following questions: What type of image was it? How is the image interpreted? By whom? Why? What is the relation to other images? What types of viewing positions does it situate? The social modality is the first level of analysis. The second level of analysis is compositional modality. See Figure 1 for explanation of how the questions are linked to the theoretical framework and how this guided our analysis.

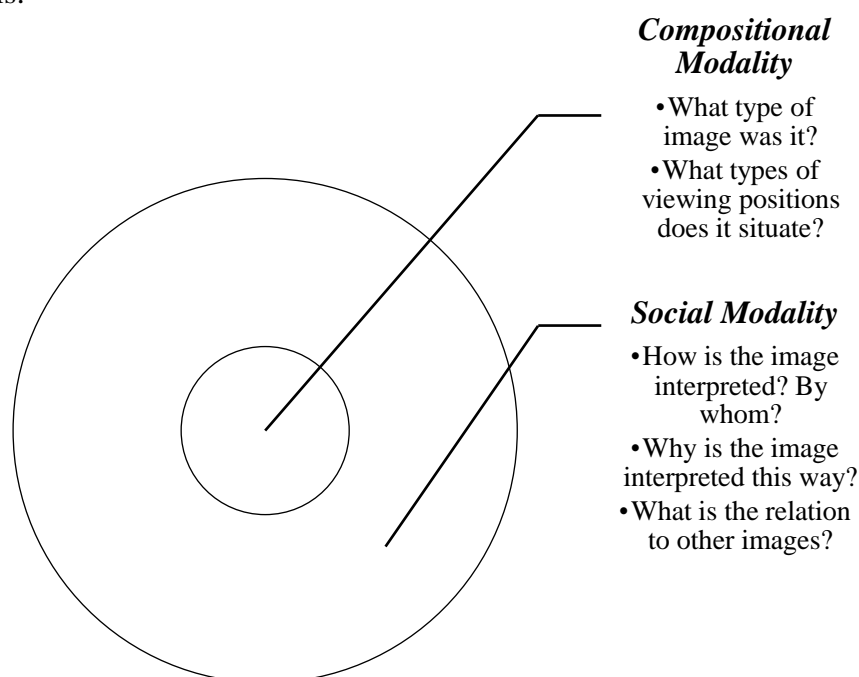


Figure 1. Description of Critical Visual Methodology analysis demonstrating levels of social and compositional modalities

The final stage of analysis was member checking. After this analysis, the research team returned to Kenya to discuss the analysis with the participants and conduct member-checking. The final themes represent ideas after the member-checking stage.

Findings

The purpose of this paper was to understand the potential of this methodology in terms of understanding the participants' perspectives on environmental perceptions. As such, data is presented as examples of the potentiality of the audiencing of the photovoice method. Below (see Table 2) describes the codes of the compositionality and social modalities of the site of audiencing.

Table 2. Site of Audiencing Themes

<i>Social</i>	<i>Compositionality</i>
How interpreted?	Relation to other images Viewing positions offer
Important aspects of surroundings	Shares local knowledge
Issues affecting the environment	Documents context
The balance of humans and the environment	Documents knowledge

For social modality, the three codes documented are: important aspects of surroundings, issues affecting the environment, and understanding the balance of humans and the environment. These codes guided the compositionality modality layer of analysis. For the compositionality modality, the three overarching themes that emerged are: shares local knowledge, documents context, and documents knowledge. Below we will describe each of the themes in the compositionality layer.

Shares Local Knowledge

This methodology positions the participants as experts of the knowledge and in complete control of the knowledge they want to share with the researchers. Below, Magda's picture (see Figure 2) of students studying outside the classroom is an example of how her cultural knowledge is shared through photovoice. Here, she describes specific ways in which environmental sustainability knowledge is transferred from teacher to student. She points to the importance of teaching outside the classroom in order to learn about the environment. Although this idea is not unique to environmental education, what is important to note is the emphasis on the benefits of the environment (i.e. food droppings and nestings) from the actions of the teachers and students. Through her narrative, we are reminded of the ways in which knowledge is taught and how this community is thinking about the future generations in terms of sustainability. Additionally, we are able to view the important aspects of her surroundings (compositionality modality) and how she views this sharing of knowledge (social modality).



Figure 2. Magda's photovoice where she describes the importance of science teaching to create future conversationalists. Her narrative reads, "This picture is from one of the schools in the Mara (Africa) which really impressed me to find these teachers having changed their man-made constructed marking area to this naturally breezing environment. When asking them why they decided so, they gave me the following reasons: fresh breathing air, birds, melodies, varied butterflies species flying towards different directions, cool breezes from tree shades, natural flower scents, spacious and sufficient natural light. As you observe this picture, you note this desire had prompted the same teachers to be carrying out daily clean-up of this venue as their very important resting, tea taking and marking of pupils' books area. Birds on the other side benefits from food drops and nesting habitats. Science teaching teachers all gain a lot from the environment while teaching. Learners begin to desire conservation activities while still young which will make them potential future conservationists."

In a similar way, Catherine shares her knowledge about Acacia trees. She provides her audience with information about where they grow and her thinking about how these trees can cause problems for the local rivers and shares what she understands to be a problem with drought and how these types of trees contribute to that drought.



Figure 3. Catherine's picture of Acacia trees. (June 7th, 2012). Her narrative reads, "These trees grow in semi-arid areas. They have roots, which go deep into the ground in search of water. When they grow near the riverbanks they can dry up the river leading to drought. On the other hand they are a source of fuel to many homesteads because the trees are burnt to produce charcoal."

The idea of cooking fuel was of high interest to the participants in terms of frequency of the pictures submitted. Here, Nina describes how jikos help to converse the environment because they use less firewood than other types of wood-burning stoves. Through the use of photovoice, Nina shared her local knowledge on these stoves and how they can reduce the amount of deforestation from felling trees for firewood.



Figure 4. *Nina's picture of a jiko (a stove that uses less wood than a typical wood-fired stove). Her narrative reads, "I got interested in this jiko because of its conservative nature. Since most people in Kenya uses firewood for cooking, this jiko uses very few pieces of firewood to cook hence avoiding felling down of trees thus conserving the environment."*

Documents Context

In this theme, the participants documented context in a way that was related to the environmental issues they were recording. Although this is not surprising, as photographs tend to paint pictures of our surroundings—what is important is the way in which they talked about the context as related to the solutions for the environmental issues they are confronting.

Below is Sarah's picture (Figure 4) of a bridge made from tree branches. In her photovoice we can visualize the bridge and understand her viewing position (compositional modality) but with the narrative, she documents what she believes is important about her surroundings (social modality).

In her narrative, Sarah says, "this shows how we can make use of the resources available to do the impossible." Here, Sarah illustrates the ways in which the bridge-builders here are resourceful. Without her narrative, one might make certain assumptions about the bridge or even the people who use it. Instead, Sarah remarks this as a way in which the community is overcoming some of the challenges they face and the ways in which they solve these seemingly impossible tasks by doing the "unbelievable" and that is "a bridge rarely found." So, while she is documenting the unusual with her photovoice, she is providing context for her audience so that we are aware of what is typical and what is not.



Figure 5. Sarah's picture of a wood bridge (June 24th, 2012). Her narrative reads, "A bridge rarely found. This bridge is made of tree branches and mud. It is unbelievable that even the lorries use it. Local people made it after the falling of the permanent one. This shows how we can make use of available resources to do the impossible."

Similar to Sarah, Jonas documents local context through his definition of what he calls "proper road maintenance" (See Figure 6). By using the photovoice method, we have the benefit of understanding the audiencing site including the compositionality through the image taken and the social modality through the words written about the image. Jonas's photovoice provides an example of how these two pieces work together. Without his words, "I took photo on road, proper road maintenance controls soil erosion," we would have made alternative conclusions about the picture of a dirt road. Here, this photovoice provided a clear contextual solution for one of the biggest environmental/modernization challenges—Road maintenance.



Figure 6. *Jonas' picture of proper road maintenance. (June 26th, 2012). His narrative reads, "I took a picture of proper road maintenance that controls soil erosion."*

In a different way, David documents context when providing historical context to his picture. In this way, he is situating the context in a broader sense—a context that is dependent on understanding how the pastoral people of Africa have changed due to land adjudication practices and colonialism.



Figure 7. David's picture of cow dung (July 8th, 2012). His narrative reads, "For hundreds of years, the movement of pastoral people across East Africa rangelands ensured a constant redistribution of nutrients. As seen in this picture, heaps of cow and sheep dung are deposited outside most homesteads for years due to families settling down following privatization of land. Most families have no idea that the heaps are full of minerals needed in pasturelands. Typically a grazing cow sheep or goats goes out into the plains and for 8 hours eat leaves and grass. Upon chewing, the dung is deposited in the kraal and later swept outside to sit idle for years. By doing so, and unknown to many, the drylands are becoming poorer and unable to support the pastoral people."

Documents Knowledge Construction

In this theme, we found that photovoice was able to document knowledge construction of the participants. In this way, we assert that photovoice became a way for the participants to document knowledge about their environment. Daniel's photo (Figure 7) of farmland in southwest Kenya depicts crops being grown. His narrative describes one of the challenges in



Figure 8. Daniel's photovoice about farmland in Kenya (May 29th, 2012). His narrative reads, "Forest land and pastures land in Narok County south west of Kenya has increasingly been converted to farms to produce maize, beans and wheat to feed the ever increasing human population. At independence in 1963 Kenya had 6 million people now we are about 40 million and bringing in 1million kids annually. At this rate there will be no forest or pasture land left in the next few decades. Unless we find innovative ways to solve this problem we may be heading to doom as far as our fragile environment is concerned."

Kenya—population growth. Here, he documents his knowledge about one of the implications of overpopulation on the environment. He suggests this will lead to destruction of forest and pastures. He ends his narrative with a call to find innovative ways to solve this problem.



Figure 9. Timothy's picture of charcoal markets (May 20th, 2012). His narrative read, "This is an open charcoal market at Narok town. I visited the market yesterday. I talked to the traders in the market. They told they me they sale almost a 100 bags per day at the market. I inquired of the source of their supply. They said the charcoal comes from forest just around Narok town. This was of great concern to me because if 100 bags of charcoal are sold daily in this market, it means a lot of trees in the forest around Narok town are being destroyed daily. This is hazardous to the environment .to conserve and safe the environment for future generations. An environmental friendly source of energy should be encouraged (i.e. the use of solar energy, use of gas, electricity, with the aim of saving the forest and the environment for generations to come."

Similarly to the way Timothy described how through the photovoice he learned about the amount of charcoal that is sold and where the charcoal came from, Mary learned about overstocking and how the environmental impacts of this practice. Below in her picture of grasslands and through her narrative, she describes what she learned through this methodology.



Figure 10. *Mary's picture of overstocking (May 27th, 2012). Her narrative reads, "I chose this picture because from it I learnt that overstocking can lead to environmental disasters as it results to overgrazing, which leads to reduction of vegetation cover hence rapid soil erosion which results to gulley. Soil erosion reduces crop yields. Reduction of vegetation cover leads to droughts, which in turn leads to mass deaths of wild and domestic animals. Man suffers a great loss as famines persist as a result of poverty and lack of food. Tourism activities also decline. As a result of poverty, crimes increases, which in turn might lead to civil wars making the earth, unfit to live."*

In addition to viewing the participants' knowledge, this methodology afforded opportunities for the participants to document what is of critical importance to them.

Discussion

The combination of words with the photograph offers another code that provides insight into what the participants were thinking when they took the pictures and how they were constructing meaning as related to the terms of the study (environment, sustainability, conservation, nature). As Wang and Burris (1994) note, "[photovoice] envisions a self-defined space that would diverge from depictions by outsiders superimposed on a culturally charged background" (p. 368). The words with the image represent the participants' lives as they see them and speak about them. As the data came from the participants themselves and as they were in control of what to share with the researchers, they maintained this control throughout the process. When combined with other collaborative approaches, photovoice has the potential for developing long-term community involvement in social action to bring about real economic and social change in post-colonial settings.

As described above, the participants shared local knowledge with the use of photovoice. In figures 2-4, the participants documented specific challenges and ways that local knowledge is critical for solving these problems. The ways in which the participants talked about context as linked to the solutions for environmental challenges mimics the way local knowledge construction as a way to maintain knowing, learning and doing, and redefining the people they are. Just as Muswa (Figure 2) described the challenges of environmental sustainability, he highlights a picture of people who can solve these problems. Thus, the challenge is not about inaction but motion towards solutions.

In addition to sharing local knowledge, the photovoice methodology documented context (see Figures 5-7). As Wang and Burris state, “[photovoice] happens in the reality of people’s lives.” In Sarah and Jonas’ documentation of context, we can visualize their lives through the photographs. The written words added another layer to the context and provided insight to whether this was typical, unusual, or remarkable. As Sarah’s narrative informs us, we are viewing something that may not be typical but she sees this as a site of strength for Kenyans to “do what is impossible.” We so often use images of “simple” buildings as a way to perpetuate a deficit perspective of how modernization and technology is better. However, Sarah’s caption is a powerful counter-narrative to the dominant hegemony. Jonas’ picture of a road could be interpreted in many ways without his narrative. However, with his words, we can also see how he is providing us with an example of a positive way to maintain roads. Thus, as these participants documented their context with their photographs, the written words allow us to hear the participants’ thinking as they were documenting context.

Finally, photovoice also documented the knowledge of the participants. As we were constructing our project, we wanted to avoid being static researchers who “parachute in” to predetermined situation where a problem is defined by the researcher and the solution comes from “experts.”

Scholars have long discussed, debated, and critiqued the impact that researchers and the act of researching have on indigenous people and communities (Mutua & Swadener, 2004; Wilson, 2008). Critical and post-modern theories materialize the notion of examining research methodological acts with indigenous communities as a deliberate act of decolonizing methodologies (Smith, 1999). According to Wilson (2008), to use decolonizing methodology means to incorporate the long community history. Ubiquitous in critiques of research *on* indigenous communities is that the researchers benefit but the researched do not. As such there is a perspective of historical understanding that is required to move forward— one must first accept the historical (here, social modality) oppression and its relationship to the research process and research knowledge produced (Swisher & Tippeconnic III, 1999). For us, during all aspects of this research project was this conversation of the researcher versus the researched. We sought to address this issue by the methodological choices we made. We wanted the stories of this community to be told and to address this issue, which has drawn clear dichotomies between insiders and outsiders. We are not asserting that we have solved the issues behind these dichotomies. Instead, with our methodological choices of positioning the researched in control of the types of the data collection process, we posit that the lines between the researched and the researchers have become more blurred. The knowledge we offer up is derived because of their willingness to share their local context, history, and everyday experiences.

Photovoice offers the possibility for one to perceive the world from another person’s viewpoint—as an entry point or a level of resonance—in this case, viewpoints of people who lead very different lives than the researchers. This insight into new perspectives is an important strength of this methodological tool because understanding the stakeholders’ viewpoint of sustainability is paramount in efforts to generate viable options for functional human- environment relationships. Ultimately, from a methodological standpoint, photovoice

allows the participants' voices to emerge through multiple modalities— oral, written, visual— thus providing the researchers with rich data sources from the participants' perspective. The free knowledge exchange permitted by photovoice allows the researcher to be close as well as stay distant from the data. As researchers interested in working with indigenous communities, we found this tool to be a way to revitalize knowledge and power in this community.

Limitations of Photovoice

Photovoice has its limitations as a methodological tool. Personal judgment influences different levels of representation: who used the camera, how a picture was taken, and what the participant chose not to photograph. As Rose described it “Visual imagery is never innocent; it is always constructed through various practices, technologies and knowledges” (p. 17). However, with the use of a critical approach to visual images, such as the site of audiencing, we considered these social practices and the effects on the viewer. Additionally, because the purpose of this methodology is to encourage the participation of the researched, we were interested in the ways the visual imagery was constructed.

Because of this type data collection, we are limited to the photographs and narratives. As researchers we were careful not to interpret beyond what the participants presented in their photovoice. However, we often conjectured about our interpretations of the narrative and photographs. During the initial phases of the data collection, we emailed the participants follow-up questions about their photovoice, but this proved to be unfruitful as the participants often had difficulty responding to the emails and tracing the particular questions to specific photographs that they had taken. Therefore, we made efforts to adhere only to the text and photographs at hand when analyzing the data. It is important to note, the visual methodologists encourage researchers to contextualize the images with words to prevent the images from becoming excessively obscured (Rose, 2012). Thus, although the photographs and narratives limited us, these data sources combined provided us with rich data surrounding the environmental perspectives of the participants.

The power of photovoice to provide participants the opportunity to express themselves was clearly evident throughout this project. This expression was authentic, rich, and principally the voice of the participants. Participants of photovoice reveal what they see, feel, and think without pressure or restraint. Data collection—even informal interviews and observations—can still feel scheduled and formal to research subjects. This is not the case with photovoice, as the data comes out naturally over the course of weeks whenever the subjects are struck by a thought, emotion, or opportunity.

Conclusion

Photovoice makes an influential contribution to educational research through its emphasis on participation by community members (Wang & Burris, 1997). Throughout this study, we witnessed participants' documentation and sharing of knowledge through these photographs. We posit that without this tool, we would not have been able to understand the ways in which this community valued the environment, their community, and the ways in which they are discussing the solutions. In our study, we engaged participants, which allowed them space to share local scientific knowledge that promotes sustainability. We find inspiration by using decolonizing methodologies. We hope these insights and stories provide support for other science education researchers striving to use similar methods.

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