"Sankofa"

HOW INDIGENOUS TRADITIONS CAN INFORM SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES IN GHANA

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Ghana's forests, like many others, are dwindling because the country's economy is highly dependent on tapping and trading its rich natural resources. Rapid depletion of natural resources is a key concern, particularly for developing nations. While gold and crude oil are the top two exports in Ghana as of 2019, agricultural products make up seven of the top 10.[1] The quest to dig out mineral ore and grow crops for exports leads to loss of forests and biodiversity.

While the loss of forests and biodiversity are visible, less obvious losses also occur. The indigenous communities lose access to resources necessary for their culture and capital necessary for future growth. According to Global Forest Watch, Ghana lost 1.17 million hectares (Mha) of relative tree cover, equivalent to a 17 percent decrease and 0.30 percent of the global total between 2001 and 2019. This loss is equivalent to 313 million tons (Mt) of CO_2, or approximately 17.39 Mt per year.[2] Annual CO_2 emissions of 17.39 Mt is higher than the emissions from burning fossil fuels for energy and cement production in any single year over the period, which is cause for alarm.[3]

The impact on CO_2 is an additional loss to the forests and biodiversity. If this deforestation is not controlled quickly, Ghana will lose important species and its land's productivity. Since Ghana's power on the international market is driven by its productive lands, failure to focus on sustainable forest management practices now will affect its appeal on the international market in the near future. Moreover, as the world moves toward sustainably sourced raw materials, Ghana risks being blacklisted because of how its exports are sourced. These occurrences will stifle Ghana's development since exports are one main source of revenue. Aside from these economic impacts of poor forest management, Ghana will suffer a loss of air quality, drinking water, and ability to cultivate its lands to feed its people.

While government institutions have a transactional relationship with land and natural resources, local and indigenous people are less transactional. The local people have a higher interest in ensuring local resources are sustained because their livelihoods depend on the natural resources. The pattern of government interaction with forests (and other natural resources) shows that the government has a transactional relationship with the land and, thus, fails to be a good steward of the land.[4]

Conversely, local and indigenous people are attached to the land on which they reside because their livelihoods depend on it and they have cultural ties to it. Local people obtain their livelihood from the natural resources in their proximity. Many are hunters, farmers, or weavers who gain their raw materials from stems of trees. Others have a great cultural attachment to the natural resources and are more inclined to sustainably manage the resources, as opposed to large corporations and government

agencies that see the land only for its ability to yield monetary profit. Due to their cultural traditions, indigenous people are an invaluable source of natural resource management and therefore need to be included if not allowed to lead efforts to sustainably manage natural resources.[5] As we explore how a top-down approach fails, it is important to investigate if a communal management approach has ever proved useful for natural resource management.

Evidence from Native American settlements in the past and present show that indigenous tribes are well equipped to manage natural resources. The Menominee Tribe of North America even shows that natural resources can be managed while attaining contemporary levels of development. For instance, the Menominee allow trees to reach full maturity before harvesting and do not harvest more than what is produced in the trees' natural cycles. Due to these sustainable practices, the Menominee have harvested over 500,000 board feet of lumber over the past 150 years but have more trees standing now than before.[6] In addition, Elinor Ostrom presents compelling research to show that indigenous tribes are better situated to manage natural resources.[7]

The competing priorities of the government and indigenous people have led to many failed promises and a breakdown of trust among stakeholders. This breakdown has left indigenous people lethargic and disinterested in cooperating with the government for natural resource management.

Hence, this report explores whether indigenous knowledge exists to be tapped for natural resource management in Ghana and what barriers prevent it from being tapped. To this end, the report summarizes cases in which the benefits of indigenous knowledge and leadership have yielded sustainable development. Then, it investigates the specific types of knowledge that indigenous tribes in Ghana may possess regarding the country's natural resources. Finally, this report explains how the breakdown of trust and social cohesion stands as a barrier preventing the inclusion of indigenous leadership and knowledge in managing Ghana's natural resources.

Literature Review

There is extensive research to show that indigenous and local people are better positioned to manage their natural resources. Ostrom is a prominent proponent for local people to self-manage their natural resources for better outcomes.

Ostrom's Social-Ecological Framework for Natural Resource Management. Ostrom extensively studied how the inclusion of local dwellers in resource management can yield effective results as compared to government impositions. Ostrom suggests that individuals are most likely to self-organize when the benefit exceeds the perceived costs of users investing in collective norms and rules for the resource. Implementing collective rules can be difficult when individuals fear that others may not comply, cheating the individuals out of using the resource. Since perceived benefits and fears cannot be measured, Ostrom presents 10 variables that signal the likelihood of local people self-managing their resources.[8]

Ostrom asserts that these 10 variables make groups of people self-manage natural resources—contrary to the belief that individuals would always dissipate public resources.[9] The first variable in the framework is cost. According to the framework, large territories are unlikely to be self-organized given the high costs of defining boundaries. Next, she asserts that an already depleted resource does not draw attention to locals to manage. Also, users should be able to estimate the results of particular measures such as harvesting rules or no-entry requirements.

Ostrom also claims that mobile resources, such as wildlife, are less likely to be self-managed.[10] Thus, local people would usually rally around to conserve plants (or forested areas). The users' population is also important, according to Ostrom. Big groups are better suited to manage a large resource area. Conversely, a small resource area with a large group would be harder to mobilize people. Because people have to be led toward a shared goal, leadership is also vital. Recognized local leaders promote local conservation efforts. By extension, local power over the given

resource unit and social norms and ethical standards go a long way to fostering local conservation.

Ostrom's 10th variable relates to the resource's importance.[11] When the resource is of high importance to the users and the users have common knowledge of the resources' relevant attributes, then they would be more likely to conserve the resources. These last two points are interdependent because it often takes more than a casual interaction with a resource unit for a user to gain knowledge of how the resource system works.

Ostrom also advocates for a wide variety of rules for managing resource systems since "simple blueprint policies do not work."[12] Her research shows that, to be effective, rules must be consistent with local norms and conditions. This means that whatever rules are set to govern a resource management system must align with the community's shared values and belief systems. Additionally, rules should match the resources in the specific resource system. Researchers are expected to adapt these variables to suit differing scopes of resource networks and systems.[13] Some key variables for this research are leadership, norms and social capital, and the local people's knowledge of the social-ecological system (SES).

Ostrom's socio-ecological framework adds to the literature that a one-size-fits-all approach is not effective in natural resource management.[14] Before Ostrom's work, shared natural resources systems were predicted to be depleted unless the resource was privatized or controlled by the government.[15] Ostrom conducted a series of case studies around the world that show forest management is more effective when the local people are included in the management and conservation efforts.[16] More research since shows that local and indigenous people possess adequate knowledge for natural resource management.

Capacity of Indigenous Knowledge. In 2019–20, California wildfires destroyed over 20 million acres. Five of the 20 largest wildfires in California's history occurred in 2020. The US Forest Service has begun to acknowledge that the broadcast understory and cultural burning practices of the native tribes were much safer and more sustainable forestry management approaches.

The rampant fires in California have forced policymakers to partner with native tribes, specifically the Karuk and Yurok Tribes of Northwest California, to revamp the approach to forestry management techniques to curb the rampant wildfires.[17] Without realizing it, the US and state government officials demonstrated the power of "sankofa"—learning from the wisdom of the past.

California's return to tribal management practices of wildfires is a strong testimony to the indigenous tribes having knowledge that is useful for contemporary natural resource management. The tribal practices were in place long before the lands were taken over by the US government. Understanding the socioeconomic and cultural framework of the former tribal ways of life helps explain how the practices were successful instead of resulting in the tragedy of the commons.

Kat Anderson's 2005 study *Tending the Wild* provides an in-depth examination of the economic and ecological practices of the tribes living in what is currently California.[18] Anderson documents how the tribes managed their natural resources with specific conservation practices. The case study provides evidence that the existence of Ostrom's framework leads to a society's ability to sustainably manage common resources.

The tribes were populous in relation to the lands they occupied, with a population density of about one person to two square miles in some areas. This population density could have led to fast degradation of resources as the tragedy of the commons suggests. However, the opposite happened. The tribes sustainably managed their lands and natural resources until management was taken away from them.

The indigenous people knew about the benefits of controlled burning as a prominent "tool" for vegetation management. Burning was used to enhance growth and cultivation of some tubers, greens, and mushrooms. It was also used for pest control.

Moreover, burning enhanced the quality of materials used in creating cultural artifacts, such as baskets and household items.[19] Burning was also said to have highly benefited wildlife.[20] An elder from the Sierra Miwok tribe shared how he learned from his father and grandfather how they had burned underbrush in

the forest in October and November to reduce the snowpack and performed controlled burns in hunting areas so more food was available for deer. They also practiced resource management techniques such as irrigation, tilling of the soil, pruning, sowing, transplanting, and weeding. Ecologists have proved that these practices help conserve the diverse species of plants and animals throughout California.[21]

The tribes depended on their natural surroundings for their livelihoods. They had a rich source of flora and fauna for food, medicine basketry, weapons, tools, games, shelter, and ceremonial items.[22] As such, they needed to understand the various species and ensure a guided interaction with their environment to conserve and manage resources. They acquired profound knowledge due to their close and daily interaction with nature.[23]

Anderson's case study highlights the degree to which California tribes understood the system dynamics of their natural surroundings. Due to their understanding of the plant species, the tribes practiced cautious harvesting practices. Different plants were harvested at particular times of the year and left to grow at other times. Thus, there was no continuous harvesting throughout the year. Many Native Americans depended on revenue from their basketry enterprises, so there was much incentive to ensure the continued growth of the peculiar shrub species. Other shrub species were used for arrows or cultural items. Also, California tribes harvested different plant species at different frequencies throughout the year. This allowed for periods of rejuvenation for plant populations.[24]

Moreover, there existed shared social norms and ethics among various tribes of California. The Tolowa and Quechan Tribes had a gathering rule to "spare plants and plant parts" and "don't harvest everything."[25] Similarly, Anderson reports that the Maidu alternated the side of the tree from which they harvested for basket weaving, to allow for rejuvenation. They also designed specific tools for harvest that did not destroy the plants.[26] These social norms and practices largely contributed to the successful management of natural resources. Interviews with contemporary members of the tribes show how these social norms ensured abundance in the future.[27]

According to Ostrom's framework, local leaders increased the chance that the tribe could collectively manage its shared resource. There is no explicit mention of local leadership in Anderson's case study, but the existence of tribes suggests there most likely would have been locally recognized leaders. Nonetheless, they adhered to social norms and expectations of interactions with their environment.

These observations suggest that the size of a resource system, predictability of system dynamics, number of users, existence of norms and social capital, collective-choice rules, knowledge of SESs, and the importance of the resource all lead to self-management of a common resource unit.

Concern About Involving Local Groups. Anderson's and others' studies have provided evidence of the wealth of ILK for sustainable management of forests and other natural resources. Yet, indigenous tribes lose the ability to conserve natural resources when removed from their lands—a phenomenon observed with the Baka Tribe of Cameroon. Savanna Carson et al. studied the local Baka community evolution and relationship with the forests.[28] The study also illustrates the current barriers to inclusion in forest governance. Through semi-structured interviews, Carson et al. researched local people near the Dja Faunal Reserve and their perceptions regarding local relationships with forest management, use of forest resources, livelihood, community traditions, and health practices.[29] They found that the local people express an awareness of the lack of Baka rights to traditional land tenure in forestry management. The Baka people have been forced out of their homes (the forests). Now, they watch timber companies destroy their home but have no rights to the forests to protest.

Moreover, they are foreigners on the lands on which they reside. The Baka tribesmen are unhappy because they have no land rights. This has created an uncertainty regarding current approaches to forest conservation and management in Cameroon. The interviewees expressed a lack of inclusion in, or a feeling of exclusion from, forest management. They grieved that the government did nothing to protect the forest.[30]

The tribesmen see both positive and negative

impacts of their relocation outside the forest. Some positives are receiving education, working on farms, wearing clothes, and learning to speak French. The negative is that future generations will lose their culture and ancestral land and forest. Baka interviewees highly regarded education as important for community improvement but worry about the loss of traditional ecological education due to generational livelihood changes.

Further, the Baka interview participants worried that future generations would never know about the biodiversity of certain animals due to forest degradation. They expressed concern about the loss of species such as giant pangolins, bush pigs, and big antelopes.[31]

The case study on the Baka Tribe shows that excluding indigenous tribesmen from natural resource management not only leads to loss of culture but also has negative economic implications. The tribesmen have knowledge they are willing to contribute for the sustainable management of the forest. Yet, they are unable to apply this knowledge because they have lost control of their lands to the government.

A second, less discussed phenomenon is that excluding indigenous tribesmen from a role in resource management leads to a loss of labor to work to preserve the natural resources. The consequence is the loss of not only the natural resources but also a share of the economic gains from those resources' exploitation. Ostrom and Harini Nagendra suggest that successful management strategies involve indigenous tribesmen as allies in natural resource conservation efforts.[32] They describe that it is costly when governments take the sole responsibility of protecting forest reserves because there comes a need for hiring guards, fixing electric fences, and obtaining guns. This approach also creates an antagonistic mechanism between locals and government officials. However, all these expenses are not necessary when the local people are allies. Rather, the local people come together in one accord to ensure the forest resource is protected.

Both Ostrom and Nagendra and Christine Etiegni, Kenneth Irvine, and Michelle Kooy show that a top-down approach to resource management is ineffective when the practices conflict with local dwellers' norms.[33] The latter studied the conservation of beaches at Lake Victoria. The comanagement system (i.e., local people's involvement in governance) did not improve the condition of the fishing practices, but rather made the situation worse. Etiegni, Irvine, and Kooy attribute failure to corruption and kinship.[34]

Ostrom's work predicts the failure Etiegni, Irvine, and Kooy observed. The findings from the surveys show that local leaders who had the mandate and authority to serve as mediators between local fishers and the government and hold the fishers accountable abused their position for personal gain.[35] Moreover, the appointed leaders failed to enforce government regulation due to reluctance to harm one's kin. This led to a failure to take action against the violation of government regulations. Thus, the community viewed obligation to kinship as more important than ensuring compliance with government fishery regulation.[36]

This concern points to the power of social norms as Ostrom predicted. While these factors led to poor outcomes in the area of study, locals' involvement in resource management is not necessarily a total setback. The ineffective management of the fisheries due to kinship affiliation does not mean that involvement of locals always yields negative results. It only highlights the prominence of traditional beliefs in the society, which if well appropriated, can be used to benefit the governing bodies and further the course of effective natural resource management.

Engdawork Assefa and Bork Hans-Rudolf found positive outcomes in places where indigenous and local knowledge (ILK) was used.[37] However, they recognized that ILK practices have declined in recent years due to factors such as land and labor shortage, shortage of livestock feed and the resulting shortage of livestock, and a lack of incentive or support from the government.[38] Thus, they call for preserving ILKs and fusing them with modern science to better preserve natural resources in the area. A more inclusive approach, Ostrom argues, will harness insight from science and indigenous knowledge and yield optimum resource management.[39]

Background and History of Land Management in Ghana

In Ghana, lands are generally owned by chiefs and family heads based on ancestral settlement. Nonetheless, the government wields utmost power over all the lands in the country and has constitutional provisions that allow it to take lands it deems profitable for its use. The cultural and government dynamics for land ownership have many implications for forest management.

Postindependence Forest and Land Management. When Ghana gained independence from its colonial masters, the nation rejoiced, believing leaders from within would consider the people's best interest. But this has stayed a hope in many regards. After attaining independence, most constitutional amendments were about the people's rights and freedoms and political administration.

For a long time, Ghana's forestry was managed by a 1948 policy that, for its date, was obviously enacted by colonial masters at the time. It was 47 years later, in a September 1995 policy brief, that the government realized the colonial policies were ineffective in managing the country's natural resources and pledged to move toward public participation in forest management.

The following excerpt from the 1995 policy briefing lists the strategies the government promised to carry out:

> 5.5.5 development of consultative and participatory mechanisms enhance land and tree tenure rights of farmers and ensure access of local people to traditional use of natural products;
>
> 5.5.6 promotion of national tree planting programmes as positive community-building actions which generate raw materials and income while improving the quality of the local environment;
>
> 5.5.7 initiation and maintenance of dialogue with all interests through a national advisory forum (i.e., the Forestry Commission) and related district conservation committees to ensure active public participation in forestry and wildlife matters;
>
> 5.5.8 initiation of continued contract and liaison with the local authorities and communities to pursue integrated development activities related to sustainable resource management.[40]

Thus, according to the government, one main strategy to solve the emerging problems associated with forest conservation was to involve local people and authorities. This is a commendable goal. But the government has fallen short of that goal, and it is a major reason local people and authorities have lost trust in the government's words and intentions. In doing so, the government has lost an opportunity for social cohesion and the expansive social capital of locals.

Feigned Local Participation. It can be misleading to focus on government publications and policies on natural resource management as a marker for participatory management. It is in the government's interest to portray a united front to foreign agencies and investors. Hence, the government is often quick to partner with nongovernmental organizations (NGOs) that work on tree planting and natural resource conservation efforts and movements that seek to foster participatory management. However, the government's commitment is questionable when its contracts with foreign companies are audited.

A case study conducted by Manali Baruah, a doctoral student at the time, reveals how the government's creation of the Community Resource Management Area (CREMA) inhibited decentralization and sidelined local authorities in forestry management, an outcome opposed to its stated goals. According to the paper, the Forestry Commission of Ghana has total responsibility for the management and use of forest resources. However, increasing pressure from international agencies including the International Monetary Fund and World Bank led to promoting decentralization of forestry governance by the state. Nonetheless, decentralization remained limited due to the money-generating power of forestry resources

such as timber and precious mineral mines sites. This feigned local participation is one of the driving forces that led to the erosion of social capital and trust.

In 1996, for instance, the District Assemblies lost decision-making power over the commercial use of forests (e.g., felling trees). Chiefs had full rights over forests during colonialism, and they had rights to create forest reserves. This right was taken from them after independence, as the government tried to gain control over income-yielding resources to stabilize itself internationally.

The Ghanaian state set up forestry initiatives in 1990 to involve local people in forest management. CREMAs were set up under a group of programs collectively known as Collaborative Resource Management Programs to facilitate the decentralization of forest management power. Under the mandate, external donors fund and the state implements CREMAs with both local and international NGOs. However, Baruah's research shows that the CREMA is primarily influenced by "divisional mandates, technical and managerial priorities without real focus on rural inclusion."[41]

One NGO that has served as a liaison between the government and local people for natural resource conservation partnerships is the International Union for Conservation of Nature (IUCN). In a brochure sharing Ghana's outcome story, IUCN highlights ineffective community participation in natural resources governance as one main barrier to its success.[42] It also cites vulnerability and certain inequities, insecure tenure, inequitable benefit sharing, and carbon rights as other key barriers. IUCN mentions that it has successfully achieved clarification, codification, and protection of tenure rights; equitable benefit sharing; female representation in natural resource management; and civil society engagement and participation. Although these are commendable achievements, the interviews conducted in this research show that the local people are at the mercy of government mandates and many inequalities still exist. Consequently, the locals' autonomy and ability to self-manage their region's natural resources are inhibited because they are largely excluded from resource management decisions and their land ownership is undermined.

Vulnerability, Inequities, and Insecure Tenure. The vulnerability and inequities in forest management are largely related to the poor and insecure tenure system. In Ghana, the government reserves the right to take lands it deems productive for its projects. One way this is beneficial is that the government has taken ownership of green-zone belts—land along water bodies—for tree-planting projects to prevent the water from drying up. Although this can be valuable in some respects, it has the tendency to rob local people of their productive lands and leave them kowtowing to any government whims. It also plays a huge role in eroding trust, social cohesion, and sense of agency of the local people. Rather than have the government wield so much power, some of this power must be decentralized and given to local authorities (chiefs) and people.

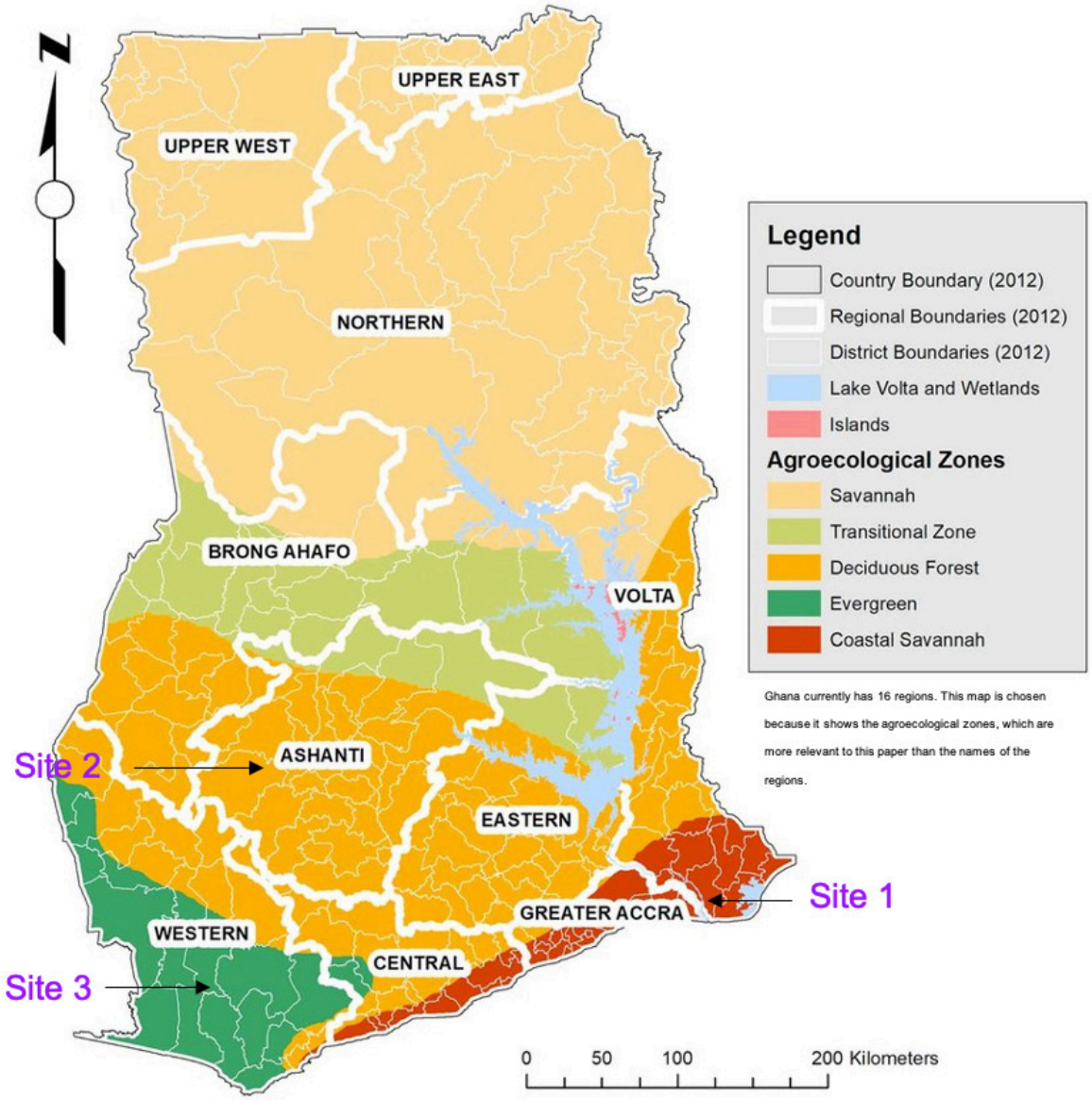
Methods

To understand the forest management dynamics on the ground, I conducted interviews with indigenous people and local leaders of cultural groups and government officials.

Clarifying Terms. Indigenous people are generally understood as people who lived in a country or geographical region before other groups arrived.[43] In this report, I use "indigenous people" to describe the predominant tribes in the Ghanaian geographic areas, after whom the country's regions are subdivided and named. For instance, the Ashanti settled in the Ashanti Region in the 17th century and remain the predominant tribe and culture there.

Subsequently, "local people" refers to the people who live in a given region or area and whose livelihoods depend on the amenities and resources there. Thus, in many cases, an overlap exists between indigenous people and local people. Indigenous people can be local in either their native lands (often rural areas) or other settlements (often urban areas). Hence, "local people" is a broader term and used frequently here to refer to people who are both indigenous and local to an area.

Figure 1. Three Interview Sites and Agroecological Zones



Source: Tawia Abbam et al., "Spatiotemporal Variations in Rainfall and Temperature in Ghana over the Twentieth Century, 1900–2014," *Earth and Space Science* 5, no. 4 (2010): 120–32.

Both local and indigenous people depend on forests. One main distinction, though, is that people in rural areas depend on the forest and its resources, such as streams, directly, while those living in urban areas depend on these resources indirectly.

Availability of Indigenous Knowledge for Natural Resource Management in Ghana. With the evidence of Ostrom's assertion that the existence of factors such as local leadership and knowledge of resource systems fosters conservation in a shared resource system, it is important to determine if indigenous knowledge is available. It will be helpful to know how to harness this knowledge by creating a conducive environment (using Ostrom's framework) to ensure the remaining forest resources are well managed.

To answer the second question, I conducted interviews with leaders in three agroecological zones of Ghana: the Greater Accra Region (Coastal Savannah Zone), the Ashanti Region (Deciduous Forest Zone), and the Western Region (Evergreen Zone). These regions are hereafter referred to as Site 1, Site 2, and Site 3, respectively, as cited in Figure 1. Ghana currently has 16 regions. This figure is chosen because it shows the agroecological zones, which are more relevant to this chapter than the regions' names.

Interview Method. Six correspondents were interviewed. Each of the three sites was represented by at least one correspondent. The main focus was to interview chiefs in the regions. A public official and politician were also interviewed to allow for balanced comparison and perspectives. Also, two city-dwelling respondents were interviewed to balance the rural perspective with the urban one. For Site 2, I interviewed the chief of Abuakwa and an Akan language and culture teacher. From Site 3, I interviewed the queen mother of Egyambra and an assembly member of the Ahanta West Municipality representing Busua. The interviewee for Site 1 was an Osu native who has a degree in land economy and is a chartered administrator and management consultant. In addition, I interviewed a field worker with the Forestry Commission of Ghana.

The interviews were based off Ostrom's framework of 10 variables that predict a high chance of self-management.[44] Using a mix of open- and closed-ended questions, the interviews sought to find out what specific cultural practices were used to manage natural resources in their cultural lands or ethnic group. The questions also seek to find out which practices have been discontinued, which continue to date, and what the perceived reason is for halting or sustaining resource management practice. (See Table 1.) For cases in which management practices failed to continue, the interviewees were asked follow-up questions about how they believed these practices could be revived (if relevant) for the sustainable management of resources in their area. Some interviews were conducted in local Ghanaian dialects and translated accordingly.

Results

The interviews reveal the availability of indigenous traditional practices for natural resource management. The interviews also show challenges including land ownership, property rights, and contract enforcement that affect the inclusion and use of indigenous knowledge in management efforts.

Resource System Dynamics. The prevailing theme in the interviews was "When the last tree dies, the last man dies." This was explicitly mentioned by at least two interviewees. All six correspondents recall having stricter norms and concern for their society to manage natural resource when they were growing up. The interviews I conducted showed that indigenous knowledge exists to a degree in the local communities that were interviewed. Interviewees recounted principles that governed natural resource management.

One interviewee said:

> Anywhere around here [was] forest. In the 70s . . . we have two estuaries here. You dare not [misuse them] because it is dedicated to the gods. It is communal. . . . We had a laid down principle. The gods will not be angry when you follow the principle. You can go to the forest, any forest, including someone else's forest . . . fallen branches as firewood, you can pick as many as you want . . . if you do that, the gods will not be angry. But if you go and cut a tree . . . nobody dare do that. If you cut a tree, you can't even sleep.[45]

Another interviewee said:

> At first, they [the elders] will tell you that along the banks of a river, no one should fell a tree. The reason is to not [make] the water dry. . . . Two, we have the notion that seven days that God gave us, we have to rest for one day. And our ancestors knew that before even the Bible came. The rivers that you are going to fetch water, he has to rest. The trees and even the bush where you are going to weed, they must also get a time to rest. But there is an additional reason that we have to give [the trees] rest. Just imagine, we are all staying in one town. Every Tuesday when you

Table 1. Interview Questions, Based on Ostrom's Variables

Ostrom's Framework	Interview Questions	Rationale
Size of Resource System	• How do your people care for your land and water bodies? • How would you describe the boundaries of your cultural lands? • What are the management practices you have now, and in what ways could they be improved? • What are three ways you would describe your interaction with your cultural lands when you were in high school? How has that changed now?	These questions seek to determine if the natural resource is too big for locals to manage. They check if there is any sense of management for their natural resource system, and they make the interviewee try to recall, compare, and contrast how they have lived in relationship with their cultural lands in the past (i.e., descriptive not evaluative).
Productivity of Ecosystem	• What are some cultural and economic uses of plants and animals in your ethnic group? • Do you believe there is a lot left to preserve?	These questions seek to determine if any indigenous plants or animals have gone extinct in their locality, find potential causes for the extinction, and learn the importance of remaining species to the local people.
Number of Users	• How does the community respond to ILK pertaining to resource management? • What might encourage people to be more excited about preserving the lands rather than selling them off?	These questions seek to determine the availability of knowledgeable local people in ILKs and to what degree people are interested or disinterested in management.
Leadership	• In what ways is respect waning, and in what ways might it be regenerated? • How would you describe the involvement of local elders by policymakers in natural resource conservation in your area? • How would you describe the involvement of youth by policymakers in natural resource conservation in your area? • Would you suggest a different approach?	These questions seek to determine if people respect the local authority (chiefs, subchiefs, youth group leaders, etc.), the extent of local involvement in management effort, if the current generation is knowledgeable and reliable for ILK-based management, and the views of the interviewee about whether current land practices should change.
Norms and Social Capital and Knowledge of the Social-Ecological Systems	• To what extent do you understand the rainforest and its dynamics on a cultural or traditional level? • What traditions does your community have that are peculiar to current natural resource management (i.e., farming, grazing, hunting, forests, minerals, etc.)? • Are they still followed to this day? Why? Why not? • How has your community responded to demographic and other pressures that affect sustainability?	These questions seek to determine the availability of ILK and whether specific ILK is available. They also seek to learn if indigenous practices are reliable or if they were shunned because they were ineffective and to find coping mechanisms and signs of resilience of ILK.

(*continued on the next page*)

Table 1. Interview Questions, Based on Ostrom's Variables (continued)

Predictability of Dynamics	• How effective would you say the indigenous practices you have mentioned are in preserving forests or bodies of water?	These questions seek to determine effectiveness or ineffectiveness of ILKs and the cause for effectiveness or ineffectiveness. (This is an open-ended question to gather examples.)
Importance of Resource to User	• How important is the forest area and its water bodies to your community?	These questions seek to determine effectiveness or ineffectiveness of ILKs and the cause for effectiveness or ineffectiveness. (This is an open-ended question to gather examples.)
Collective-Choice Rules	• How much authority do local people have over their lands? • To what extent do you feel a change of autonomy over your natural resources? • How did that occur?	These questions seek to determine if there is tribal autonomy over natural resources and whether authority is slipping or if authority changed out of local hands to someone else.

Source: Author.

> cross the river there is a problem. . . . Every Tuesday, when one goes to farm and cuts a tree, there is a problem. Even the tree can fall on somebody [or] the river can take somebody away. So, if that be the case, we have to know that Tuesday, this river has to rest and the trees and everything must rest.[46]

These responses show that local tribes have traditions by which they managed the natural resources they had. Some practices have, however, lost their charm and are not all followed on as large a scale as before. Before Christianity became prevalent in Ghana, people's belief in the power of the gods made them submit to traditions for natural resource management because they feared punishment. The advent of science and Christianity has, however, reduced people's fear and thus led to the neglect of traditional practices around natural resource management.

> The advent of Christianity, if we look at the genesis of it, they term everything that we did, more especially our cultural practices that they didn't understand as fetish. So people became Christians or became educated, they thought those things are either not relevant/necessary or are two, fetish practices instead of cultural practices. The third point is that chiefs and the elders in the family do not explain it well to the younger generation to appreciate the rationale behind what they were doing. So, with time the thing died out.[47]

Former Versus Surviving Management Traditions. Interviewees across all three research locations show that local people have a degree of knowledge pertaining to the use and management of their natural resources. The knowledge base can be divided in two: former traditions and surviving traditions. "Former traditions" refer to all traditions that have been abandoned regarding natural resource management, while "surviving traditions" refer to the practices that have survived and are still practiced today. Some former and surviving traditions from the interviews are listed in Tables 2 and 3.

Some former traditions became outmoded, while others just lost enforcement. Modernization is one reason cited for the decline in forestry management and is the reason some practices became outmoded.

An Akan language teacher said:

> In the olden days, [living in close harmony with nature] helped our ancestors to even name plants

Table 2. Former Traditions

In the Ga Community (Site 1)	In the Akan Community (Sites 2 and 3)
• No farming along banks of rivers • Women not allowed to fish (because they were seen as selfish) • No crab trapping on Fridays, when it closes due to tidal waves; natural forces close the lagoon • Forest and mangrove protection put around lagoon to control erosion • No drainage to lagoons • Custodians (the Wulomey) oversee enforcement around lagoons	• Reverence for trees; no one allowed to cut trees for firewood • Reverence for water bodies in general • No selling of foodstuff at night • Not allowed to take water from the house to the farm or forest • No singing when eating or your mother was believed to die • Annual communal labor day • The gods will beat you up if you defecate in a river

Source: Author.

Table 3. Surviving Traditions

In the Ga Community (Site 1)	In the Akan Community (Sites 2 and 3)
• Fishing banned for Homowo rites to release a lot of fish	• Estuaries sacred (though the level has reduced)

Source: Author.

based on their use. Same with animals. For instance, lion and tigers were said to prey on animals. But they don't prey on humans just like that. They hear voice (appellation). So if you meet them and call the animal by their appellation . . . [they] respond.[48]

An Abuakwa chief said:

[In] one of my towns, there is a big river called Offin. If you mistake, on Tuesdays, you may go and come safely or you may go and not come back. It still happens. And if you are drowned in the river, we have to pour libation to beg the river that the one who has drowned, let us see the person . . . some may take two days . . . others three.[49]

Living close to nature helped local people gain knowledge about the natural resource system and its cycles and species. Also, the fear of being punished by gods prevented locals from flaunting rules and norms. Former traditions, such as those preventing cutting trees for firewood, helped protect trees in the forests and prevented rampant felling.

The traditions that have survived, such as the Homowo banning of noise and fishing, have survived because they are celebrated as part of annual festivals. According to the interviews, other traditions, such as the reverence for estuaries, still exist because the estuaries are named after gods and are sometimes hard to reach.

Disregard for Local Government and Leaders. A growing disregard for local authority has also made it difficult to enforce local traditions. There is general concern that local leaders are no longer respected whether by local people or the government. Talking about the disregard for local authorities concerning protecting natural resources, the assembly member lamented, "I have beat gong-gong several times."[50] The chief of Abuakwa affirms this observation, saying, "There are some people who are so reluctant. If you advise them, they don't take it unless something happens that they will go back [and take it]."[51]

The local chieftaincy feels there is no hope that power will be restored to the local chieftaincy because the government enjoys wielding utmost power. When asked what the local chieftaincy was doing to restore the reverence for the management traditions, the queen mother said:

> Now the whites have passed power through politicians and "government of Africa," not Ghana, and this has made the chieftaincy weak. Why am I saying this? Right now, imagine there is someone in my town and I ask them not to defecate here and they do and I summon them. It is now in Ghana's laws that when summoned by a chief, you can choose not to go.[52]

Supporting the queen mother, the assembly member said:

> Oh yeah, [that] is what the police told me too. . . . The power belongs to the politician. Because if the police catch you and the politician calls and says "hey this is my boy," they will release him.[53]

Land Ownership, Property Rights, and Contract Enforcement Challenges. The disregard for local leaders is connected to how land ownership, property rights, and contract enforcement are handled in the regions. Initially, local people own lands by settlement, and this land is passed down from generation to generation. These lands are usually overseen by clan leaders and then chiefs. The interviewees from Site 3 said the system of land ownership and choosing leaders affects the locals' allegiance to the chieftaincy. They explained that in the Ashanti kingdom, the people elected to have an Otumfuo be their paramount chief and leader. The Ashanti people, thus, have sworn allegiance to Otumfuo and have committed themselves to receive any due punishment for their disobedience.

In contrast, in the Western Region (Site 3), the chieftaincy is based on who settled the land first. Because people did not have a say in who the chief was, their allegiance and submission to chiefs in this region are limited. Nonetheless, the interviews show that the self-election of leaders is not the only reason some regions have stronger chieftaincy than others do. It was disclosed by some of the interviewees that another reason for the weakening of local chieftaincy in some regions is that the "whites" succeeded in creating multiple paramountcies (i.e., supreme chieftaincy authority), dividing locals and easing the trade of precious minerals and resources.

An added layer of complexity exists because all resources in and beneath the land or waters belong to the government by law. Locals are not happy about this. So, the government reserves the right to take all lands it deems productive for its purposes. An interview with a field worker from the Forestry Commission of Ghana provides evidence for this. According to the interviewee, the government has secured all the lands around water bodies. The government's efforts with the green-zone belt project have been met with constant backlash by the local indigenous people and their leaders.

> Government has the lands along water bodies. We normally call those places green-zone belts. This is water bodies reserved for the government to plant trees to save our nature. . . . Looking at Accra [Site 1], most of the trees are being cut down for buildings. What we observed in that area is that if we don't plant trees, some few years to come, the water will get dried up. . . . Some of the chiefs have sold all the lands. So what they are doing now is, where we own the trees, . . . we have full grown trees . . . they are cutting down the trees.[54]

Analysis

From the interview results, three dynamics stand out that need to be addressed—namely, storehouses of resource management knowledge, blame shifting, and breakdown of trust and social cohesion.

"Storehouses" of Resource Management Knowledge. The interviews show that indigenous traditions in the different local groups are valuable for natural resource management. However, disregard for local authority, leaders, and traditions due to modernization has relegated this knowledge to "storehouses"—custodians of tradition, often members who remain in native towns or who are closely connected to the local chieftaincy.

But the creation of the storehouses can also be attributed to the lack of or inappropriate explanation of the elders' culture. Because of modernization and Christianity, only a handful of people will obey an instruction because they will be punished by the gods. As described by one of the interviewees, the ancestors and elders "lacked a culture of explanation."[55]

Blame Shifting. The government blames the local people for mismanagement, and the local people blame the government for destroying natural resources. When government officials were asked what they believed was the cause of the massive destruction to natural resources, they blamed it on neglect by the local people.

The Forestry Commission of Ghana worker said:

> Some of the chiefs have sold all the lands. So, what they are doing now is, where we own the trees . . . we have full grown trees . . . they are cutting down the trees . . . because people want to build, they don't care about the nature. What I will say now is that people do not care about the nature. They only care about building, acquiring property.[56]

The assembly member said:

> These . . . estuaries were sacred. The Abokwa was sacred. As for that one you can't easily go there. The two estuaries were sacred . . . when I came [from Europe in the '90s] my boss had a canoe. We go and fish and get crabs. In fact, it was beautiful. White people loved it. . . . Nobody knew what happened. Within some few years, people are just cutting the thing [trees] down. . . . Yes, they are natives. How can you go there as a foreigner? . . . Here [Busua] they were doing [cutting down trees], . . . Tarkwa was doing. It's like spontaneous. Everybody started doing it. . . . They needed the trees more than the trees being standing. It [unemployment] was a key.[57]

Nonetheless, when asked what percentage of trees are cut by natives in comparison to foreigners, both the assembly member and queen mother agreed that foreigners cut down 80 percent, especially Chinese immigrants during mining operations. The natives cut down the remaining 20 percent.

The queen mother said: "It is not 50–50. Let's take it 80–20 because when they are doing their *galamsey*, they use to uproot some of the trees with their bulldozer."[58]

The assembly member said:

> It is true that the Chinese clear the land for *galamsey* . . . that is, for surface mining and they have approval from the government. . . . They have it. As for that one we have lots of evidence because you call them and you hear an MP or minister talking. And they will command the regional police to come. . . . How can you say you won't allow it? . . . The regional police commander will come with the division commander, with the district commander. What can you say about it? You can't do anything because of the division [among chiefs] . . . so the unity for the locals is not there.[59]

From the interviews, it becomes apparent that all parties are complicit in the mismanagement of natural resources. However, destruction from foreign agencies, supported by the government, is higher than the damage from the locals is.

Breakdown of Trust and Social Cohesion. Indigenous knowledge is needed to sustainably manage natural resources. The interviews show that local

people carry a wealth of knowledge often passed down by oral tradition. This knowledge evolved because of living in close interaction and using natural resource systems. In the past, the locals and their leaders had full control over forests and other natural resources in their tribal lands. This authority is now largely in the government's hands.

Nonetheless, there is a missing link between the local people and the government about who is constitutionally vested with the power to convene stakeholders for natural resource management. Thus, there is an underinvestment in local social capital. This neglect has led to the absence of social cohesion around natural resource management.

Social cohesion is needed for participatory management of natural resources. The ability for local people to self-manage their resources effectively requires trust from the government in the people's capability to contribute to conservation efforts. The local people also need to trust that their efforts will not be countered by the government turning its back on contracts and selling indigenous lands and resources to be cultivated or exploited by foreign companies and other nations.

Dirk Stanley, a specialist on the erosion of social cohesion in Canada, defines social cohesion as "the sum over a population of individuals' willingness to cooperate with each other without coercion in the complex set of social relations needed by individuals to complete their life."[60] Thus, social cohesion in natural resource management is a measure of how stakeholders are willing to work together to attain a common goal of sustainable management. Trust is an essential factor that allows for social cohesion around natural resource management. Unfortunately, there is a lack of trust among key stakeholders (i.e., the government and the local people and authorities). The breakdown of trust between the local people and the government proves a huge barrier toward including indigenous knowledge in natural resource management in Ghana.

Recommendations

Trust needs to be restored among all stakeholders to restore social capital around sustainable management of natural resources. This can be achieved through an indigenous identity approach to effective community participation in natural resource management.

Restoring Social Capital. The majority of locals do not understand the value of their cultural practices. For the masses, the cultural practices are a means of control through fearmongering. That is one main reason few management traditions have survived. The ancestors had good intentions for natural resource management but capitalized on fear as a means of enforcing these values. Since Ghana is now majority Christian, the potency of fear as a means to enforce these traditions has failed. There is a need for traditional storehouses to partner with the government agencies for shared understanding and to redefine cultural practices.

In addition, former management traditions need to be reviewed, redefined, and renewed where necessary. This would enhance two of Ostrom's variables: norms and social capital and knowledge of the SESs that help locals understand the rationale behind the traditions and increase the chances of traditional practices being followed to conserve natural resources.[61]

The government needs to work with the local authority. Currently, the government wields utmost power with resource allocation of productive lands and forests. The government has to restore some authority to chiefs so they can make decisions and punish wrongdoers in their communities. Empowering the chiefs will help make traditional knowledge easily enforced in local communities.

A collaborative effort is also needed because each party (i.e., government and local leaders and people) has a valuable role to play for sustainable forest management. The local leaders serve as the storehouses of knowledge. This knowledge can be effectively redefined and taught broadly with the support of government agencies such as the National Commission for Civic Education. Furthermore, it takes collaborative work with the locals themselves to

ensure that all the work of the local leaders and the government is followed.

As one interviewee put it:

> It boils down to a very good and workable policy that needs to be trusted and all stakeholders must be involved . . . involve the fisherfolk for instance, the farmers, the opinion leaders . . . and then you come out with very feasible policies from it that will sustain the interest of everybody and then you derive your law from it. What we do in Ghana is that we write a law and then derive our policies from it . . . out of the policy framework, then you enact a law. . . . That is why most of the laws are being flaunted.[62]

Although local leaders must be empowered, there also needs to be checks to make sure the locals can hold them accountable. The interviewees mentioned instances in which chiefs collaborated with governments to misappropriate natural resources and cases in which local leaders sold one piece of land to multiple individuals. Explaining the scientific and cultural significance of different cultural practices, for instance, will help prevent leaders from using these practices as a tool to cheat or oppress the local people.

Indigenous Identity Approach to Effective Community Participation in Natural Resource Management. Individuals are more likely to self-manage or be active participants in natural resource management if they find the resource relevant to their cultural existence and livelihood.[63] Although many NGOs have pursued ways of including local people in natural resource management, they have often failed to seek out the cultural relevance and knowledge that the local people have to contribute to natural resource management processes. A consideration for adding local people as valuable agents due to their cultural knowledge will add a level of interest to local people and make them more valued in the decision-making process.

The IUCN, for instance, continues to work in Ghana to improve local participation in natural resource management. Its successes could be increased if it includes an indigenous identity approach to participatory management. According to its 2019 annual report, IUCN's priorities are valuing and conserving nature, promoting effective and equitable governance of natural resources, and deploying nature-based solutions to address societal challenges.[64]

While these are laudable goals, locals involved in this process become tools to reach a desired goal rather than self-acting agents working toward sustainable goals. Hence, there is a need to harness the cultural capital that indigenous or local people have to offer in resource management.

Conclusion

This chapter investigated the specific types of ILK available and the barriers to taking advantage of it for natural resource management in Ghana. Analysis drew on Ostrom's framework for interviews with local indigenous leaders and case studies. Ostrom's research shows that, in many circumstances, local groups can better manage their natural resources than a top-down approach can, if they have the appropriate agency to act. Case studies of the Baka Tribe of Cameroon and Native American tribes in the US motivate this research. These indigenous peoples have deep knowledge about their natural resource environment, which helped them conserve their common resources. Structured interviews based on Ostrom's framework were conducted with indigenous local leaders in Ghana and demonstrated the indigenous knowledge for the sustainable management of natural resources in this context as well.

More importantly, however, the interviews revealed serious barriers to effective resource management. Even though local leaders are purportedly included in resource management, their beneficial local knowledge is not employed. The knowledge is relegated to specific cultural leaders, and trust has eroded among the stakeholders, leading to a lack of social cohesion. Hence, trust needs to be rebuilt, especially between the government and local leaders, to make way for collaborative natural resource management in Ghana.

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