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IDENTIFYING THE DOMINANT ECOLOGICAL WORLDVIEWS OF COMMUNITY LEADERS AND THE INFLUENCES THESE HAVE IN MANAGING CONSERVATION AREAS IN GHANA

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ABSTRACT

This study was set on the premise of a research question that sought to identify the dominant ecological worldviews of Community Resources Management Area (CREMA) leaders and the influences these have on the management prescriptions of their conservation areas. The relevance of the question was to identify whether the CREMA leaders subscribed to an eco-centric or an anthropocentric worldview which could have direct consequences for the control of resource levels of utilization after the devolution of authority. A phenomenological approach was thus applied to collect data from nine selected conservation leaders from three different CREMAs. Their ecological worldviews were found to be mixed—depending on the ecological worldview domain, the CREMA leaders showed leanings toward stances ranging from complete eco-centrism to ambivalent eco-centrism and ambivalent anthropocentrism. The findings, however, mostly suggested that the dominant ecological worldviews of the CREMA leaders were eco-centric and not anthropocentric. They exercised the middle ground, i.e., ambivalent ecological worldviews stances, to influence sustainable natural resource utilization while complete eco-centric worldviews were applied to protect balances in ecological functions. The leaders applied these determinations to promote the dual purposes of the CREMAs as they were set up for nature conservation and socio-economic development in Ghana. The study also recommends that the findings should be explored further to develop adaptable criteria that include ecological worldviews in the selection of CREMA leaders.

KEYWORDS

anthropocentric; conservation; eco-centric; ecological worldviews; CREMA leadership; phenomenology; sustainability

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INTRODUCTION

The Community Resource Management Areas (CREMAs) policy in Ghana is projected to promote participation of communities and their leaders in biodiversity conservation (Agyare, 2013; Asare, Kyei, & Mason, 2013). The arguments for community conservation programs are strengthened by empirical evidences that suggest common property management is possible under collaborative principles (Brooks, Waylen, & Mulder, 2013). The trump has been the notion that collaborative programs promote the interests of major stakeholders in natural resources management, thereby generating cooperation. In the CREMAs, the hitherto strict state conservation laws (which are not too effectively enforced) are replaced with locally generated constitutions and bylaws to govern biodiversity resource conservation (Owusu-Ansah, 2020).

The Wildlife Division of Ghana relinquishes biodiversity conservation and its utilization rights to communities that establish CREMAs by transferring authority to recognized structures and their leaders (Bandoh, 2010). The emphasis of CREMA constitutions and bylaws is not on selecting individuals with nature conservation ideals to assume leadership but rather on fair representation from participating communities. A CREMA is managed by a volunteer executive committee whose members are selected by each participating community in an equal representation format (Owusu-Ansah, 2020). The selection is based chiefly on the goodwill an individual enjoys from community members who look up to him/her to defend their interests at the executive committee level. The CREMA conservation programs flourish on effective interrelationships between the committee and the Wildlife Division. The CREMA leaders liaise between their communities and the Wildlife Division together with other state and non-state agencies to implement conservation activities.

Harley, Metcalf, and Irwin (2014) stated that environmental leaders emerge to address challenges that affect resources utilization in their communities. Again, it is noted that CREMA leaders emerge to pursue both personal and community interests (Owusu-Ansah, 2020). CREMA leadership emergence can therefore be related to personal beliefs and value judgments an individual places on the resources of the environment (Vining, Merrick, & Price, 2008). It is assumed then that these beliefs and value judgments would be informed by the individual's ecological worldviews (Schein, 2015).

Ashdown (2006) defined worldviews as unconscious assumptions by which a person defines reality by interpreting those assumptions as beliefs. According to Ashdown, Kearney's (1984) seven universals of self, other, relationship, time, space, classification, and causality have formed the basis of studying worldviews. Kearney's model is centered on the self and its influences on the individual relationship with others which goes beyond person-to-person interrelationships to the environment and the structures within society which shape behavior. Thus, the CREMA leaders' ecological worldview would be informed by the seven universals teased out from their environment/society. It can be argued that the CREMA leaders' ecological worldviews influence the identification of environmental challenges (Harley, Metcalf, & Irwin, 2014) which then allows for the classification of the causes of those challenges. The classification of the causes of these challenges is also defined by space and time (Valk, Belding, Crumpton, Harter, & Reams, 2011) and these will affect management prescriptions (Schein, 2015) that will be applied to biodiversity resources utilization.

According to Dunlap, Van Liere, Mertig, & Emmet Jones (2000), an individual has two ecological worldviews of which one is dominant. A person's dominant ecological worldview could be eco-centric or anthropocentric. The anthropocentric worldview is related to the belief in human superiority over nature—consequent to continuous growth, socio-economic development, and abundance (Schein, 2015) irrespective of ecological outcomes. The eco-centric ecological worldviews promote the balance of nature, limits to growth, and foretell possible looming eco-crises in the magnitude of apocalypses because of human abuses of nature (Kopnina, 2011).

The purpose of this study was to identify the CREMA leaders' ecological worldviews and the influences these had on their management prescriptions after they achieved devolution of authority for their conservation areas. This study's purpose stemmed from Schein's (2015) assertion that the role of sustainability leaders in ensuring global ecological stability has not received the needed attention. Schein mentioned that although understanding the roles of the ecological self in shaping the developmental paradigms of an individual is important, it has received little appreciation for its application in developmental psychology. Thus, this study's objective was to contribute to fill that gap by assessing the ecological worldviews of CREMA leaders. The relevance is that a CREMA leader's subscription to an eco-centric or anthropocentric worldview could have direct consequences on the kind of

management prescriptions they would pursue in controlling the levels of resources utilization after the devolution of authority (Kopnina, 2011; Vining et al., 2008).

ECOLOGICAL WORLDVIEWS AND CREMA LEADERSHIP

Schein (2015) drew inspiration from a number of theoretical frameworks including eco-psychology, integral ecology, deep ecology, and developmental psychology to study the ecological worldviews of corporate world leaders. He found out that the leaders' ecological worldview stances were explicit about eco-centrism or anthropocentrism. The sustainability leaders also connected their ecological views, which have been formed throughout their lives, with their beliefs about nature, and they again applied sufficient knowledge that emanated from their awareness of ecological issues on the global scale.

Ordinarily it would be expected that those who assumed CREMA leadership would subscribe to eco-centrism; however, Owusu-Ansah's (2020) report on CREMA establishment opportunities and leadership emergence lends credence to the belief that some leaders could possess anthropocentric views. His assertion that some CREMA leaders emerge to apply their personal knowledge and experiences in conservation could be positively linked to eco-centrism. Notwithstanding, the two other bases of CREMA leadership emergence, which were 1) expected personal benefits and 2) nominations of individuals with good standing in their communities into management positions, could be linked to different considerations other than ecological sustainability criteria. This assertion is buttressed by earlier findings of researchers like Brooks et al. (2013) that showed that some of the bane of community conservation projects is caused by dissonance in objectives, ineffectiveness at times in applying market incentives, and failure to identify power brokers in communities when it comes to participatory management issues.

Thus, identifying the dominant ecological worldviews of the CREMA leaders along the spectrum of Lundmark (2007) as cited in Kopnina (2011) and the delineation of ecological stances into five central domains that express individual-specific viewpoints and their influences on management motivated the study design. The five domains define the specificity of individual eco-centric or anthropocentric worldviews. The five domains are: 1) Human dominance over nature, 2) Human exemptionalism, 3) Balance of nature, 4) Risk of eco-crisis, and 5) Limits to growth.

However, due to the dichotomy between development and conservation (Romero et al., 2012), a person could possess an ambivalent worldview of the two extremes (Erdoğan, 2009) but one will be dominant (Dunlap, Liere, Mertig, & Jones, 2000).

This study design reflected on the aforementioned theoretical underpinnings in a participatory natural resources conservation context. This was in addition to the corporate sustainability leaders' roles in promoting policies like eco-labeling, corporate social responsibility, and eco-friendly technologies to gain social acceptance of products and good corporate citizenship (Wolfgramm, Flynn-Coleman, & Conroy, 2015). The CREMA leaders build on biodiversity conservation principles to solicit technical and economic support for community development (Owusu-Ansah, 2020). This study applied qualitative methods to understand how CREMA leaders leverage biodiversity conservation to promote socio-economic development in their communities without compromising on ecological integrity (Ekpe, Hinkle, Quigley, & Owusu, 2014).

The main research question of this study was: What are the dominant ecological worldviews of CREMA leaders and the influences these have in managing conservation areas? The relevance of the study question is in determining the kind of potential impact the dominant ecological worldview of the leaders could have on the resources entrusted to them for management. It can be assumed that a complete anthropocentric worldview leader would in no time cause serious degradation to resources while a complete eco-centric leader could also be a disincentive to the CREMA conservation ideals because there would be more restrictions to resources utilization (Schein, 2015).

MATERIAL AND METHODS

Study Areas

Sayinga-Kasena-Gavara-Kara (SKGK), Wechiau Community Hippopotamus Sanctuary (WCHS), and Zukpiri Integrated Wildlife Sanctuary (ZIWS) were selected for this study. These CREMAs were purposely selected because they have similarities in location and differences in origins and longevity. These areas occur in the same savanna vegetation of northern Ghana but their origins are marked by community initiatives to collaborate between communities together with state and non-state

agencies. The major conservation issues of concern in the CREMAs are annual bushfires and the unsustainable utilization of natural resources in the form of poaching and illegal logging. The differences and similarities were expected to generate data that could be useful in identifying the CREMA leaders' dominant ecological worldviews and how these have impacted on the management of their conservation areas.

The SKGK is located between latitudes 10°45′00″ N and 11°00′00″ N and longitudes 1°18′00″ W and 1°39′00″ W with a land area of 587.26 km^2. The CREMA was established through a partnership between the Wildlife Division and the nine communities that constitute the conservation area. The SKGK received its certificate of authority in 2016. The place is part of the migratory route of important fauna such as elephants (*Loxodonta africana*) and buffalos (*Syncerus caffer*) between Ghana and Burkina Faso. The main objectives of the SKGK are to conserve wildlife species and leverage these for socio-economic development through eco-tourism and to promote the sustainable development of Non-Timber Forest Products (NTFPs) trade such as in shea nuts (*Vitellaria paradoxa*) and beekeeping.

WCHS was founded in 1998 by the paramount chief of its 17 communities with the sole aim of conserving the declining hippopotamus (*Hippopotamus amphibius*) population along the Black Volta River (Agyare, 2013). WCHS is also known to be rich in biodiversity with recordings of 50 mammal, 237 bird, and 32 reptile species. The conservation of the hippopotamus has resulted in the protection of a 34 km^2 area which serves as the core zone. Among the three study sites, this CREMA has a comparatively developed and thriving eco-tourism enterprise and organic shea nut business within the larger agricultural landscape.

Asare et al. (2013) mentioned that ZIWS was established by an interest group of herbal medicine practitioners before the concept was accepted by the surrounding 17 communities which constitute the CREMA. Aside from the main interests of the herbal medicine practitioners who want to keep an undisturbed place to sustain their business, the other objectives of this CREMA include protecting the hippopotamus population found along the Black Volta River and other wildlife species for eco-tourism development. ZIWS received its certificate of devolution to operate as a CREMA in 2011 (Agyare, 2013). It covers an area of 420 km^2 lying between latitudes 10°00′00″ N and 10°20′00″ N and longitudes 2°30′00″ W and 2°50′00″ W.

Phenomenological Approach to the Study

The researcher applied a qualitative phenomenological approach to explore the ecological worldviews of the CREMA leaders through interviews. People's perceptions about the world or how the things of the world appear to them are best explored in phenomenological studies. Phenomenological studies allow researchers to cross beyond themselves and into universal views (Groenewald, 2004; Kafle, 2011). According to Finlay (2009) and Sloan and Bowe (2014), phenomenological concepts promote the study of human consciousness and of essences lived from within an individual's experiences.

Ecological worldviews are inherently lived experiences of people concerning nature and this makes the application of the phenomenological approach to this study appropriate (Finlay, 2009; Laverty, 2003). The CREMA leaders' ecological worldviews were assessed through interviews guided by the 15 statements of the New Ecological Paradigm (NEP) scale developed by Dunlap et al. (2000). Each of the five ecological domains has three statements under them (Lundmark, 2007). Two of the statements under human dominance over nature and human exemptionalism are anthropocentric whereas the other is eco-centric. For the balance of nature, risk of eco-crisis, and limit to growth domains, two of the statements are eco-centric and the other is anthropocentric. The CREMA leaders were asked to agree or disagree with each of the NEP statements. They were then made to express their lived experiences under each domain. The leaders' values, beliefs, attitudes, and behavior toward nature (Schein, 2015) gathered from probing questions during the interview, together with their stances on each of the NEP statements, were used to identify their dominant ecological worldviews. Interviews were framed with a dialogue approach to allow for understanding and interpretation of participants' lived experiences that informed their ecological worldviews. Interviews took place in the offices of the participants in the evenings and on nights after field visits to the CREMAs in the mornings.

Field visits were conducted to observe some of the conservation and socio-economic development activities of the CREMAs and also to generate global positioning system (GPS) coordinates for the development of satellite imagery maps. The researcher walked along the riverine forests of the core zones at each site to observe the vegetation. GPS coordinates were taken at points where the vegetation canopy was closed at each site (Owusu-Ansah, 2019). Notes were taken on animals sighted during the three kilometer walk at each site. Notes were also taken on fire

belts that had been created (cleared bushes and "green belts" planted with *Moringa oleifera*) and on beehives mounted in the core zones. The researcher visited some shea nut processing machines at the SKGK and the WCHS as well as beehives mounted in all the three sites. These data were used to triangulate with the interview data to improve the study credibility.

Selecting Participants

Nine participants took part in separate face-to-face interviews for data collection. Three participants from each of the three selected CREMAs were purposively sampled. Selected participants were the first three top management executives (the chairman, deputy chairman, and secretary) of each of the study areas. Five out of the nine participants were members of their local District Assemblies and one was a chief of his community, making the study of the ecological worldviews of the leaders relevant as those who are in pole position in their communities get selected into CREMA leadership. Per their positions in the CREMAs, they initiate policies and projects through collaboration with development agencies to promote both conservation and socio-economic development. According to both Boyd (2001) and Creswell (1998), it is enough to reach saturation point if a researcher samples between two to ten participants for phenomenological studies. Thus, this study scope was expanded with the selection of three different CREMAs and three participants from each of the study sites to ensure rigor and credibility.

Video Recording of Interviews

In this study, interviews were video recorded. It has been debated in the literature about the appropriateness of recording interviews by video because of ethical considerations (Downing, 2008). Another challenge of video recording interviews is the difficulty of taking recordings and at the same time concentrating on the interview. The argument is that data reliability and validity could be compromised. However, according to Bene (2014), video recordings are beneficial because these allow researchers and participants to recall and reflect on their thoughts, emotions, and actions during data analysis.

The researcher sought permission from participants to capture the essences of their dialogue on video. The use of dialogue during the interview also disengaged the participants' attention from the camera. The researcher's assistant did the video

recordings, thus enabling him to concentrate on asking questions and also to take notes on important points. The advantage of the video recording was that aside from allowing for the free flow of the interview sessions, the CREMA leaders' emotions and recollections of natural resources degradation in their communities were captured on camera. These were useful during data analysis.

Legal Issues, Participants' Rights, and Confidentiality

This study did not have any legal issues to be addressed. The most important thing was for the researcher to apply proper ethics that affect human participants (Laverty, 2003; Wilcke, 2002). The researcher wrote to the management executives of SKGK, WCHS, and ZIWS about the study. He contacted the executives via telephone calls and emails to ascertain their acceptance to take part in the study and to confirm the date and venue for the interviews.

A consent form was prepared and given to each participant to read and agree to its contents before the interviews began. One of the participants was not literate in the English language and thus the content of the consent form was read to him in the language of his understanding before he took part in the interview. Participants were assured that the study was for academic and practical purposes only. They were told of their choice to opt out of the interview without any penalties should they feel to do so at any point. Each leader was given a copy of the agreed upon and signed consent form before the interviews began.

The participants' confidentiality has been protected through labeling in attributing quotations to them in the results section. A1, A2, and A3 were participants from WCHS; B1, B2, and B3 were from ZIWS; and C1, C2, and C3 were from SKGK. Labeling was done not in any particular order or through any attributions that relate to the participants' positions in the CREMAs.

Data Analysis

The video recorded tapes were uploaded into the *easytranscript* software program. This free-to-use software was downloaded from http://www.e-werkzeug.eu on January 17, 2017. Each uploaded video was played and the audio recordings were transcribed verbatim by the researcher. The researcher translated and transcribed directly into the English language the responses of a participant who spoke in the Twi language.

Nine different transcripts were separately copied, pasted, and edited in a Microsoft Word document. Data analysis was aided by the Atlas.ti software program (version 7.0). Four different codes were developed to classify participants' ecological worldviews under each domain. The codes were complete eco-centric, ambivalent eco-centric, complete anthropocentric, and ambivalent anthropocentric. Participants were classified depending on their agreement or disagreement with each of the three statements under a domain. For example, under human dominance and human exemptionalism, a participant who disagreed with the two anthropocentric statements and agreed with the eco-centric statement was classified as complete eco-centric. However, if the participant disagreed with just one of the anthropocentric statements and agreed with the other together with the eco-centric statement, he was classified as ambivalent eco-centric while the opposite would be true for complete anthropocentric and ambivalent anthropocentric classifications under these two domains. Again, a participant who agreed with the two eco-centric statements and disagreed with the anthropocentric statement under balance of nature, risk of eco-crisis, and limits to growth was classified as complete eco-centric. Also, if a participant disagreed with just one of the eco-centric statements but agreed with the other together with the anthropocentric statement, he was classified as ambivalent eco-centric under these three domains. The reverse would be true under the above scenario for complete anthropocentric and ambivalent anthropocentric classifications under these three domains. It must be stated that the other two possibilities where a participant could have completely disagreed or agreed with all three statements under a domain to produce ambivalent classifications did not occur in this study.

RESULTS: CREMA LEADERS' ECOLOGICAL WORLDVIEWS

The results presentation is divided into the five domains of ecological worldviews. Under the domains, participants' statements were used to depict either eco-centric ecological worldviews that promote natural resources conservation to achieve sustainability or anthropocentric ecological worldviews that promote views of abundance and unlimited growth. Ambivalent leanings of the leaders' ecological worldviews between the two extremes are also presented. Emphases within participants' statements are *italicized* in the quotations. The results presentation ends with some socio-economic development that have been promoted by the CREMAs. However, the presentation begins with a brief profile of the participants.

Participants' Demographics

Though the constitutions of the CREMAs have made room for women to participate in management, there was no woman at the top management level. All participants were men who have had at least a secondary education except for one who had never been to school. Participants' ages ranged within the 20–29 and 60–69 brackets. Participants have been involved in conservation activities even before their CREMAs gained the certificate of devolution that enabled them to operate as certified entities, and this is expected as they are the people who lead the process for CREMA formation. Table One below provides the details.

Participant	Age Group/Years	Educational Level	Conservation Leadership Experience
A1	40–49	Tertiary	18 years
A2	20–29	Tertiary	11 years
A3	40–49	Secondary	15 years
B1	60–69	None	12 years
B2	30–39	Secondary	12 years
B3	40–49	Tertiary	18 years
C1	40–49	Tertiary	5 years
C2	40–49	Secondary	11 years
C3	60–69	Tertiary	17 years

Table 1: Participants' Demographics

Human Dominance over Nature Domain

Human dominance over nature projects human beings as having power to rule over all other living organisms including abiotic elements. Individuals who subscribe to such a stance have complete disregard for ecological processes that permit the ecosystem to function within limits. None of the CREMA leaders showed leanings toward such an anthropocentric ecological worldview. However, they showed both complete eco-centric and ambivalent eco-centric stances.

Complete Human Dominance Eco-Centric Ecological Worldview Stance. A complete human dominance eco-centric ecological worldview stance rejects human dominance over nature and regards all species irrespective of their socio-ecological relevance to human wellbeing as important creations.

A1 from WCHS stated: "Nature, let me say people should learn how to protect it. *That is, to know every living organism has a purpose.* There is like a reason why other things were created."

A complete human dominance eco-centric ecological worldview expressed by C1 from SKGK indicated how humans should live simple lives to promote human-nature relationships that will sustain the world's ecosystem.

> I think human beings should try living simple lives … *our relationship with the environment should not affect the future and should not affect other human beings and should not also affect the regeneration capacity of the trees and animals.*

Ambivalent Human Dominance Eco-Centric Ecological Worldview Stance. An ambivalent eco-centric ecological worldview under human dominance over nature rejects human supremacy over nature but accepts that humans have the right to protect and use nature. See the statement of A2 from WCHS:

> When we are able to protect nature then all *the social and ecological benefits will be maintained and increased. Our objectives are to develop our communities and protect or conserve the environment for socio-economic benefits.*

An ambivalent human dominance ecological worldview stance is one of the major foundations for setting up CREMAs. The CREMA concept accepts human protection over nature in order to use it sustainably but not to degrade it.

Human Exemptionalism Domain

The human exemptionalism ecological worldviews domain regards human beings as unique and superior to all other species in the ecosystem. None of the CREMA leaders accepted the human exemptionalism domain which promotes complete anthropocentrism. They rather showed leanings to both complete eco-centrism and ambivalent eco-centrism.

Complete Human Exemptionalism Eco-Centric Ecological Worldview Stance. A complete human exemptionalism eco-centric ecological worldview accepts that humans are part of nature while knowing that technological ingenuity is not enough reason to detach humankind from nature. That is, a complete human exemptionalism eco-centric ecological worldview rejects human mastery over nature

and rather accepts that humans are subjects and just a part of nature. A2 from WCHS stated: "*We are all living things*. We are conserving plants, birds, hippos and even the human beings."

Ambivalent Human Exemptionalism Eco-Centric Ecological Worldview Stance. An ambivalent human exemptionalism eco-centric ecological worldview rejects human mastery over nature. However, it accepts the responsible utilization of natural resources in the manner that shows human dependence on nature. A1's statement is an indication of how humans cannot detach themselves from nature because their very existence depends on the supply of oxygen, food, and medicine, among other things, from plants: "If we go cutting all the trees it is not good because *we will not be able to live in the world again*."

Balance of Nature Domain

The balance of nature ecological worldviews domain promotes deep sustainability thinking that rejects all human interferences in the functions of nature. Balance of nature ecological worldviews believe that ecosystem function is optimal when both biotic and abiotic elements are allowed to operate freely in equilibrium without human interference. Participants again showed leanings to both complete eco-centric and ambivalent eco-centric ecological worldviews under the balance of nature domain.

Complete Balance of Nature Eco-Centric Ecological Worldview Stance. A complete balance of nature eco-centric ecological worldview accepts that nature is delicate and that all ecological processes should not be tampered with by human activities. This notion has promoted prohibitory and restrictive regulations against certain negative human activities in ecological hot spots classified as core zones in the CREMAs. C2 and A1 reflected on such notions.

> C2: *If we would have allowed the pollution of the River*, just as I was saying about the type of fishing that was going on, it would have had disastrous consequences for us and the River.…
>
> A1: So the *area is organic. Every product like shea and moringa coming out from the sanctuary is organic*. We are now introducing *beekeeping and this will be [an] organic product* and therefore farmers, instead of say going to the core zone to farm, will say, "Why not put in ten beehives?"

The two statements above indicate the basis for prohibitory regulatory regimes that are in place in the designated core zones of the CREMAs. In the core zones, inorganic agriculture, the grazing of livestock, and fishing practices that are viewed to be harmful to proper ecological functions are prohibited. The leaders organize patrols and anti-bushfire strategies together with some economic incentives to protect the core zones.

Ambivalent Balance of Nature Eco-Centric Ecological Worldview Stance. An ambivalent balance of nature eco-centric ecological worldview accepts that nature is delicate but does not reject the notion that certain negative human activities can be contained within nature constraints. B1 shows how certain socio-economic activities deemed to be ecologically harmful can be allowed in certain areas of the CREMA but not in the core zones:

> B1: At a point in time you know that whatever actions we take in the environment, we may face the consequences. *Negative economic activities that degrade the environment like charcoal burning are allowed at the development zone* and not in the core zone.

The ambivalent leaning of the CREMAs on balance of nature means the leaders are also careful not to extend their objection to human interferences in the balance of nature to all areas of the ecosystem. It suggests that the leaders are mindful in meeting the socio-economic development demands of their people while still promoting conservation.

Risk of Eco-Crisis Domain

The risk of eco-crisis ecological worldviews domain envisages an impending ecological disaster due to human abuses of nature. All the participants were simply eco-centric, believing that the world was heading for an eco-crisis if the trend of nature abuses continued.

Complete Risk of Eco-Crisis Eco-Centric Ecological Worldview Stance. A complete risk of eco-crisis eco-centric ecological worldview stance accepts that humans are abusing nature to the point of destroying ecological systems and causing species extinction. B1 mentioned a series of issues that indicate how human beings are destroying nature which can be detrimental to human existence, along with eco-crisis warning signs:

> Because God's creation is being destroyed. He did not tell us to do that. *[The time] has come; if we are not careful we will not get a place to farm, the rivers are drying, there are constant bushfires.*… The benefit of the CREMA is [also] for the future generation and if we have not *[conserved] the forest, [today's] children [will] not have seen a hippopotamus.*

Again, B3 emphasized the threat of an eco-crisis by stating, "I agree because *we can see the desert coming and if we do not do anything about it, it will catch up with us."*

Amenity values of natural resources are essentially fueled by eco-centric ecological worldviews. One of the amenity values of a natural resource that is very much cherished is the mere knowledge that a species exists for those who behold such species. B2's statement emphasized the return of some species in the CREMA as averting an eco-crisis: "There were some animals *like the hartebeest, I only knew them by name since I was born, but now I am seeing [a] few of them."*

C1 expressed climatic change impact on the ecosystem and its negative consequences on ecological processes and famers' livelihoods in the SKGK as examples of an eco-crisis. His statement showed that changes in the weather conditions of the SKGK are yet to be understood by the farmers to enable them to adapt to climate smart agriculture, that is, to harmonize land tillage and the sowing and harvesting of crops to the changing climatic pattern.

> If you look at even from infancy when we were children, *the nature of the crops and the yields, the timing of the rains and by this time of the year, we should have gotten more than one rainfall to begin planting by now;* certainly, there is an eco-crisis.

The above statements from the participants are rejections of the anthropocentric notion that suggests that the risk of eco-crisis is exaggerated. Although the participants' concerns were generated from and felt at the global scale, their experiences and ecological selves brought those issues to them at the local levels.

Limits to Growth Domain

The limits to growth ecological worldviews domain rejects the anthropocentric worldview that believes in the human ingenuity of technological advancement to solve the resources scarcity challenge. It opposes the promotion of continuous human population growth, unbridled socio-economic development, and the

accumulation of wealth irrespective of the limitedness of global resources. It is only under this domain that one leader accepted a complete anthropocentric ecological worldview; three accepted an ambivalent anthropocentric ecological worldview whereas the rest were eco-centric.

Complete Limits to Growth Eco-Centric Ecological Worldview Stance. A complete limits to growth eco-centric ecological worldview stance accepts that human population growth with its quest for socio-economic development is outpacing the earth's natural resources' levels of regeneration. A1 stated, "*We are competing with other creatures because of continuous human population growth* which has increased *our demand for other materials* for economic development."

An acceptance of the notion of the limits to growth ecological worldviews domain implies that economic activities should not be at the expense of renewable natural resources and cause their degradation. The SKGK communities opting for a CREMA over a gold mining project is an example. Although the mining project would have generated employment for the locals, the long-term negative impact of mining instigated the communities to choose conservation of their land over gold mining.

> C2: We came together and fought them. We wanted the place to be reserved *because we have seen most of the other areas where they are doing gold mining [and] what has happened to their lands*. That is why we rejected them and maintained the place as a reserve.

Thinking of sustainability informed this major decision which was not simply a rejection of a mining company with a concession but also a statement of rejection of a Ghana government economic activity which the people found was not compatible with their conservation objectives.

Ambivalent Limits to Growth Anthropocentric Ecological Worldview Stance. An ambivalent limits to growth anthropocentric ecological worldview accepts the notion that the earth has enough resources to contain the current human population's growth and economic development within a framework of proper planning and fairness in distributing resources.

> A3: You know [the] human population will continue to grow and so for the demand of materials and economic development [it] will continue. *However, a careful planning can assist us to be able to live on earth with many more people even under limited resources.*

B3 accepted an ambivalent anthropocentric ecological worldview stance by noting how some of the highly populated areas of the world have been able to bring development to their people. He contended that the world can still contain many more people with its current resources.

> I do not think we are getting overpopulated especially on our continent. *The number of people in the whole continent of Africa is smaller than [in] countries like China and India and yet they (countries) are able to manage their populations in a smaller space with development.*

C3 also argued for equitable distribution in resources utilization so that many more people could live on earth. He argued for fairness in sharing the earth's resources by straightening out the imbalances in population distribution and development even in Ghana.

> I disagree, and you know northern Ghana, unlike [the] southern part, is sparsely populated although there [is] a lot of land and space for major development activities in the north. *So the earth can contain more people and provide for our needs only if [the] few rich people will not accumulate all the resources for themselves.*

Complete Limits to Growth Anthropocentric Ecological Worldview Stance. A complete limits to growth anthropocentric ecological worldview stance accepts that the earth's natural resources are enough to support the increasing human population and its economic activity at its current pace. C1 showed a complete limits to growth anthropocentric ecological worldview stance. He believed that through technology, the earth can contain the increasing human population even as the same technology can be used to regulate human population growth.

> Human beings still have the ability to control the regeneration rate of populations. *So I think the earth will never be [so] full [as] not to contain us.… Now that we are even doing activities on the sea like drilling, it means human beings can even settle there with development.* You know, because of the level of our knowledge, certain things are even resources but now we do not know.

CREMA Development Initiatives and Conservation

This section provides some insights into the establishment and promotion of sustainable economic development initiatives in the CREMAs. These initiatives are facilitated by some Government of Ghana institutions as well as by international agencies together with non-governmental organizations (NGOs). Participant

statements and the researcher's field observations provide evidences for sustainable development initiatives in the CREMAs.

B3 mentioned a support grant ZIWS received from the Ministry of Food and Agriculture of Ghana for the cultivation of a new variety of cassava that would feed into their new enterprise of processing *gari*, a local staple. The participant again mentioned how the Food and Drugs Authority of Ghana was assisting them through USAID to modernize their traditional herbal medicine practice by providing them with an encapsulating machine. The organization was also assisting ZIWS in standardizing their herbal practice to national standards.

Another development initiative the researcher observed during a field visit to ZIWS was a three-acre woodlot *Senna siamea* plantation used for sustainable fuel production. B1 confirmed that it was established by the women of the Siro-a community within ZIWS, and that the project was supported by a local NGO through seedlings and cash payments to the women to nurture the trees for three years.

Apart from soliciting support that seeks to bring effectiveness and efficiency into existing livelihoods, a number of "green" economic activities such as shea nut gathering and processing, beekeeping, developing *Moringa oleifera* products, and eco-tourism are promoted in the three CREMAs. The following statements from some participants indicate how these new enterprises are being pursued to bring socio-economic development to the CREMAs.

> C1: *These beehives have been given to them for free through external support. You can imagine if you can get five for each farmer and he gets at least ten gallons of honey a year … if you quantify in monetary terms, you realize that it is better than going into small holder farming.…*

> A2: A company came here wanting to do *inorganic agriculture which meant what we are doing with organic shea nut will be lost completely with its premium prices*. We put it on the table and vetted the proposal and we said this is not going to happen.

> A1: If [a] tourist comes, first you have the community people here to welcome the person. *He pays money. The money the tourist is paying is what we use to pay the workers*.… If you go down to the site there are boatmen that take tourists out.…

The CREMA leaders' pursuit of socio-economic development as shown above is enshrined in both an ambivalent eco-centrism and an ambivalent anthropocentrism

that seek to satisfy both ecological functions and human socio-economic wellbeing. Activities deemed to be less ecologically harmful are allowed in the core zones. The researcher noticed, for example, during a field visit to WCHS, that *Moringa oleifera*, which is evergreen and litters few leaves, was planted to serve as a "green fire belt." Under the moringa trees as well were beehives mounted along the core zone boundaries. The purpose of this was to prevent bushfires from entering the core zones by relying on the beehive owners' motivation from sales of moringa products and honey. That is, as the owners prevent fires from reaching their hives and moringa trees, they also prevent the core zones from burning.

DISCUSSION: INFLUENCES OF CREMA LEADERS' ECOLOGICAL WORLDVIEWS ON RESOURCE MANAGEMENT

This study was conducted on the premise of the research question "What are the dominant ecological worldviews of CREMA leaders and the influences these have on managing conservation areas?" The relevance of the study is that the role of sustainability leaders in ensuring ecological stability has not received the needed attention (Schein, 2015), and more so for those in community conservation. Understanding the awareness of the ecological self of individuals and its influences on conservation area management could promote the sustainability of the resources entrusted to them.

The findings under the human exemptionalism and human dominance over nature ecological worldviews indicated that the CREMA leaders rejected the anthropocentric stances of these two domains. Participants' acceptance ranged between complete eco-centrism and ambivalent eco-centrism under these two domains. These findings showed implicitly that the CREMA leaders possessed the ecological self-awareness that did not subscribe to the unsustainable utilization of resources driven by anthropocentric views of human superiority over nature (Dunlap et al., 2000). The CREMA leaders were aware of the intricate linkages of human and nature relationships which sometimes lead to unintended negative impacts on each other. These ecological selves of the leaders informed management prescriptions of limiting human activities in ecologically sensitive zones with the view that biodiversity resources are finite (Kopnina, 2011). The acceptance of prohibitory and restrictive regimes (Shafer, 2015) at the core zones through patrols to arrest and

punish offenders is an indication of the leaders' stance on eco-centrism under these two domains.

The CREMA leaders' inclinations for maintaining a functional ecological balance were also shown in the findings of recordings of complete eco-centric responses which were particularly higher under the domains of balance of nature and risk of eco-crisis ecological worldviews. These two ecological worldview domains form the basis of accepting the limits to growth ecological worldview domain. That only complete eco-centric worldviews were recorded under the risk of eco-crisis ecological worldview domain was a statement of promoting ecological processes under the balance of nature domain and also to caution about how socio-economic development should not degrade biological resources under the limits to growth domain. This was evident in the SKGK leaders' rejection of a gold mining project for biodiversity conservation under the limits to growth domain. The strong eco-centrism stance of the leaders under these three domains indicated deep sustainability thinking on their part in view of the limitedness of biodiversity resources and the awareness (Schein, 2015) of the need to maintain proper ecological function for the production of the organic products of the core zones, which yield premium prices.

Although the three study sites have differences in focal species of conservation, they have similar management prescriptions culminating in what are called core zones where human activities viewed to be detrimental to biodiversity conservation are not allowed. The large acceptance of complete eco-centric ecological worldviews under balance of nature, risk of eco-crisis, and limits to growth is embedded in the concept of a "green economy" that seeks to promote economic development without causing an ecological upset in the CREMAs (Schein, 2015). The CREMA leaders of WCHS, for example, feared that allowing inorganic agriculture in the core zone would upset the balance of nature through the application of agro-chemicals that would cause them to lose the organic status of their NTFPs. The leaders then relied on marketing tools (Brooks et al., 2013) to promote products that earned them premium prices and on law enforcement (Shafer, 2015) to advance their core zone management strategy.

The CREMA leaders largely promote socio-economic development that seeks to disengage the people from acts that degrade the resources at both the core zones

and the larger agricultural landscape (Ekpe et al., 2014). WCHS, for example, has leveraged on charismatic wildlife species like the hippopotamus that occur in the area to develop eco-tourism that provides gainful employment to some members. Again, ZIWS leaders have solicited funding and technical support from donors to promote eco-friendly businesses such as standardizing their herbal practices to increase their products' acceptance while planting materials for fast growing cassava are provided for the larger community members to promote *gari* processing. These programs have benefit-sharing arrangements for the CREMA communities while individual benefits emanate from setting up personal eco-friendly businesses in NTFPs by leveraging sustainable ecosystem services provided through the conservation strategies (Asare et al., 2013).

The empirical evidences gathered from this study indicated that the CREMA leaders' ecological worldviews were embodied in their experiences, spirituality, and emotional attachment to nature especially in its degradation and the socio-economic opportunities that come with participatory natural resources conservation (Agrawal & Gibson, 1999; Brooks et al., 2013). However, the ambivalent stances of the CREMA leaders under the five domains (except for risk of eco-crisis) contrasted one of the key findings of the Schein (2015) study which showed that corporate sustainability leaders were explicit with their ecological worldviews. Nonetheless, the ambivalent stances of the CREMA leaders were expected because the CREMAs were set up to promote sustainable development by leveraging on biodiversity conservation (Agyare, 2013). Inasmuch as effort is applied to protect the core zones through prohibitory and "green" economic strategies, the CREMA leaders have ambivalently sited what are possibly non-ecologically friendly shea nut processing machines at the development zones in the WCHS and SKGK to improve livelihoods.

Overall, the findings again prove the bi-dimensional nature of individual ecological worldviews as reported in Dunlap et al. (2000) and Kopnina (2011). It is obvious from the study's findings that the CREMA leaders applied different ecological worldview stances under different natural resources utilization conditions based on the awareness of their ecological selves (Schein, 2015). However, the major ecological worldviews of the CREMA leaders were enshrined in eco-centrism and not in anthropocentrism.

CONCLUSIONS

The ecological worldviews of the nine selected CREMA leaders were found to be mixed. Whereas participants showed complete eco-centric ecological worldviews under all five domains, one participant, however, showed a complete anthropocentric ecological worldview under the limits to growth domain. Again, it was only under the limits to growth domain of ecological worldviews that ambivalent anthropocentric worldviews were expressed by the CREMA leaders. The CREMA leaders showed ambivalent eco-centric worldviews under three domains and not for risk of eco-crisis and limits to growth. Noticeably, it was only under the risk of eco-crisis domain that all the leaders were simply eco-centric.

The findings have largely established that the CREMA leaders exercised the middle ground ambivalent ecological worldview stances to influence natural resources utilization while complete eco-centric worldviews were applied to protect balance in ecological functions by promoting prohibitory regimes in ecologically sensitive zones. These determinations serve well the dual purposes of CREMA establishment by leveraging on sustainable biodiversity conservation to promote socio-economic development in rural communities.

These findings should be explored further to develop adaptable criteria that include ecological worldviews for selecting CREMA leaders. The Wildlife Division and other development agencies that promote CREMA establishment should vet the ecological worldview stances of individuals when selecting leadership to manage the CREMAs. A good balance of individuals with leanings from complete eco-centrism to ambivalent eco-centrism and ambivalent anthropocentrism to form leadership will serve better the dual purpose of using the CREMAs to achieve conservation ideals and promote socio-economic development. The assumption is that leaders with such awareness will manage the resources entrusted to them sustainably by using these to incentivize people to support biodiversity conservation efforts.

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