ValueofEcosystemServicesto CulturalPracticesinFestivalCelebrationinRuralCommunitiesof NorthernGhana

Abstract

Cultural ecosystem services are the non-material benefits that people obtain from ecosystems. Recreational experiences,religious values, educational opportunities, cultural heritage, and traditional practices and knowledge associated with natural environments, such as indigenous ways of managing land and resources. These services enhance the quality of life of rural people and contribute to the well-being and rural livelihood. In Northern Ghana, communities along the White Volta River basin celebrate traditional festivals and the rich cultural heritage with ecosystem services of the rich and luxuriant vegetation. There is little documentation linking the livelihoods of the people, the role that ecosystem services play in their livelihood practices and their festival celebrations. Understanding of the links are important for a comprehensive appreciation of conservation related behaviours of the people. The objective of the study therefore was to document how the rural people rely on the ecosystem services found in White Volta River basin for their livelihoods and in the celebrations of their festival. Customary laws, traditional social structures, and authorities regulate the use of ecosystem services at the rural local level with chiefs, sub-chiefs community members ensuring sustainable use of resources in the ecosystem under their jurisdiction.Focus Group Discussions were undertaken with a checklist on the thematic areas. Key informant interviews were conducted and qualitative data collected.Type of provisioning ecosystem services were noted. Common activities found across all the festivals were identified as prayers to the gods and ancestors for good harvests and blessings. Rituals performances at sacred sites, and maintenance of social cohesion and the transmission of cultural values. Cultural ecosystem services are often underrepresented in policy and governance frameworks, which tend to prioritize provisioning or regulating services that are easier to quantify. Cultural practices tied to ecosystems may not be adequately considered in land use planning, resource management, or conservation efforts.

Keywords:*Cultural ecosystem, Provisioning services, Festivals, Food, and Vegetation*

Introduction

Cultural ecosystem services, such as spiritual, religious, or heritage values, are often intangible and cannot easily be quantified or assigned a monetary value. These values are subjective, deeply personal, and vary across individuals and communities. Northern Ghana is home to many vibrant traditional festivals that celebrate the region's rich cultural heritage with ecosystem services from the rich and luxuriant White Volta River basin. However the lack of a clear economic value makes it difficult to include cultural ecosystem services in traditional market-based evaluations or policy decisions, which often prioritize measurable benefits.

Communities along the basin where majorannual festivals of significance are celebrated includeBontanga, Yagaba, Pwalugu, and Zebilla in the Northern and Upper East Regions. These festivals are celebrated in the latter part of the local calendarto match with harvesting season andto thank the gods for successful farm operations, believed as blessings on the landby the gods (Kala, 2017; Northcott,2015).

These festivals are accompanied by colourful processions, drumming, and dancing, horse riding, music and dirges, family reunions, and community gatherings. Traditional cushions as well as local and exotic drinks are also shared with families and loved ones. In the celebration of these festivals, only goods and services from the ecosystem services (provisioning services) are used adhering strictly to the norms, values, and beliefs of the various ethnic groups (Dorm-Adzobu et. al., 1991).

Customary laws, traditional social structures, and traditional authorities still regulate the use of natural resources and ecosystem services at the rural local level, even though their authority has reduced with the rise of nations, states, and market economies (Ribot, 2003). Managing natural resources and controlling environmental impacts associated with land use change requires an understanding of the underlying causes, which arise out of a complex interplay of biophysical and socioeconomic factors (Serneels and Lambin, 2001; Agrawal, 2002; Rasul and Thapa, 2004).

Plate 1: ***Rubus fruticosus - fruit*** (Photo: Bizoola, 2022)

Plate 2: ***Rubus fruticosus*** **- Leafs** (Photo Bizoola, 2022)

Ecosystem services by the natural environment are benefitedby people in the rural and urban communities(DEFRA, 2007; MEA, 2005). These benefitsare from food, fiber, fuel, recreation

and cultural appreciation of nature are the various services humans benefit from the ecosystem. Rural population livelihoods depend very much on these services. Other services provided include the regulation of the climate, purification of air and water, flood protection, soil formation, and nutrient cycling.

It was noted that the vulnerable (children and disabled) do not benefit directly from ecosystem services (access to fruits, nuts etc.) because monetary value attached to these services. Generally, there is degraded ecosystem services can however in the upstream ecosystem areas difficult to access (fodder, berries nuts, fuelwood, etc.). These are either purchased or exchanged with other services available from other ecosystems. The vulnerable and disabled therefore depend on their able household members for these services.

Provisioning services are the material goods or benefits obtained from the ecosystems. These include food (including wild fruits: Plate 3&4), fiber, and energy. Regulating services include maintaining the quality of water, pollination, and climate regulation. MEA (2005) defines cultural services as "the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences".

Plate 3: ***Daniellia oliveri*** (Photo: Bizoola, 2022)

Plate 4: ***Diospyros mespiliformis*** (Photo: Bizoola, 2022)

Even though regulatory services are necessary globally in the fight against climate change, provisioning and some aspects of cultural services are also very important in the rural livelihood of communities in the White Volta Basin (Ali, and Kamraju, 2023). The focus of the study was on provisioning and cultural ecosystems.

Ecosystem services are made possible through the supporting service and vice versa. For example, agriculture depends on the soil, photosynthesis, natural predators, pollinators, etc. to produce food, fibre, energy, etc. Nutrients are drawn from the soil by the plants, fodder, etc. to produce harvest for subsistence and/or markets and the by-products (from plants and fodder) are returned to the soil by manuring, thus closing the nutrient cycle.

The sustainability of livelihoods is highly dependent on ecosystem services with supporting services keeping them in equilibrium (Folke, *et al.,* 2002; Alexandratos and Bruinsma, 2012). An

ecosystem should be able to provide the needed service and such a set of complex interdependent and functional relationships between soil, crop production, animal husbandry, and forestry must be sustained as well. Rural areas provide resources and services for urban populations, ranging from food and fiber to water, minerals, and energy (MEA, 2005; Gutman, 2007).

In the White Volta Basin, rural households depend on ecosystem services in the landscapes (Barton, 1997;Douxchamps, *et al., 2012;* Gleisberg-Gerber, 2012) for their livelihood. Management of the supporting services in an ecosystem is based on understanding the local ecological conditions, which help in maintaining or enhancing productivity, whilst reducing some harmful effects of intensive agriculture (Gleisberg-Gerber, 2012; Edem *et al.*, 2014).

Maintaining or restoring of ecosystem to a healthy state is a valuable strategy for securing or improving ecosystem services. Sustaining ecosystem service makes a substantial contribution to the effective management of natural resources. Decisions on the use of natural resources are typically made by stakeholders (including families, and community members such as farmers, and fishermen) whose livelihood depends on them and also by companies such as logging companies. Local governments and other local actors (NGOs, local agencies) can play an essential role in realising the economic potential of managing natural resources in a way that values the ecosystem services, by providing advice, creating economic incentives, and playing a regulatory role (Migot-Adholla, 1991; Kasanga and Kotey, 2001).

The White Volta River Basin offers ecosystem services and immense cultural benefits to communities and people of Northern Ghana especially those along the river basin. These services include recreational sites such aslife parks, sacred grooves/ponds,rich festivals, crafts, and textiles, highlightingthe rich cultural heritage and natural beauty customs of the people. Cultural dances and music are integral parts of social and ceremonial life in Northern Ghana. These festivals are an opportunity to preserve and promote the cultural traditions and values of the people and communities in Northern Ghana.In Northern Ghana, water and spiritual enrichment are considered as important and need blessings from the gods.

In Northern Ghana, it is a traditional gender role, socially and culturally constructed for women to provide energy, water, and soup ingredients for the home while their male counterparts takes on the responsibility of providingfoodstuff (Plate 5&6)for daily family consumption as well as for festivecelebrations (Kala, 2017; Etikpah. 2015).

Plate 5: *Arachis hypogaea* Plate 6: *Pennisetum glaucum*
(Photo: Bizoola, 2022) (Photo: Bizoola, 2022)

Management of Ecosystems in the Northern Ghana

Apart from their social responsibilities in the community, sub-chiefs ensure sustainable use of resources in the ecosystem under their jurisdiction. The sub-chiefs and 'tindanas' (Landlords) monitor and evaluate the state of the land and its resources and brief the paramount chiefs (Dorm-Adzobu, 1991).

The sub-Chiefs under this system specially seek access to the mandate for economic trees. Control measures include prohibiting the cutting of economic trees, making it a 'taboo' to visit certain places (such as riverside, farming, etc.) on certain days of the week, use of unwashed pots (e.g. cooking pots) to fetch water from streams, ostensibly to maintain the quality of water in the water bodies. The sub-chiefs determine the harvesting and felling of economic trees through local announcements made to either commence or end communal fishing and hunting.

Access to land and resources such as wood, fruits, and herbs is through clan or family heads. Land given out to family or community members can be taken back by a family/clan head if it is observed that the resources are over-exploited. Felling of trees and other woody species beneficial to livelihood is not allowed with permission. Ecosystem services such as wood, fruits, and herbs harvested from family land need permission from the family head andin communal lands from the community chief or Tindana restrictions and access to ecosystem services are eased,except when one intends commercializing these services in large quantities.

Energy is crucial in cultural festival celebrations and ecosystem service and is generally by the women in the study. Access to wild nutritious and medicinal leafy vegetables such as baobab leaves, and local chewing sticks "Nyoo" etc. are not limited to women alone.

Plate 7: Firewood
(Photo: Bizoola. 2022)

Plate 8: Charcoal
(Photo: Bizoola. 2022)

Vegetation in the basin providesvaluable trees and other vegetation including fauna and flora that are culturally valuable and source of energy for preparing meals (Plate 7&8) to the people in the region. Usually, it is forbidden to cut them, except if the tree is dead or if ecosystem services in the landscape (Fauna and Flora International, 2013). The community valuations of ecosystem services are based on the type of ecosystem services accessed and the lifespan of the source. The resources were put in three categorised before valuing:

Biodiversity support (a diverse range of plant and animal species), cultural significance (resources for cultural and traditional practices, identity, and reinforcing social cohesion), and soil health (soil fertility enhancement and erosion control) promoting sustainable agricultural practices. The preservation and sustainable management of provisioning services is thus very essential for rural livelihood survival.

Methodology

The White Volta River Basin lies mostly in Northern Ghana and has diverse ethnic groups, cultural similarities, and little variations in ecosystem management among the communities (Kasanga and Kotey, 2001). Four (4) ethnic groups/communities are; the DagombasinBontanga, Kusaasi in Zebilla, Grunni in Pwalugu, Moagduri in Soo, and Kasena in Tono in the study area were visited for data collection. *Transect Walk:*In the landscapes, the transect walks were along the river constructed from the upstream through the downstream end of the main drains. Communities in the landscape within the peripheries of the White Volta River were visited and interviewed. *Focus Group Discussions*were undertaken with achecklist on the thematic areas (Type and purpose of the festival, materialssocial, natural, and financial capitals) of the study, with different age groups based on gender (men and women).Group discussions involved age groups between 40 and 75 years and groups consisted of 7 to 9 members.

Research in ecosystems and ecosystem services requires the involvement of community members with good knowledge of the landscape(Fagerholm, et al., 2012).*S*nowballingwas used to identify key informants in and outside the communities.At least one influential person with good knowledge of the vegetation in the landscapewasidentified in the community and interviewed. Six*Key Informant Interviews* and seven opinion leaders were interviewed in each of the four communities in the landscapes. Qualitative data were collected and analysed.

Results and Discussions

The predominant festivals observed in this study include the *Damba Festival* celebrated by the Dagomba people, which marks the birth and naming of the Prophet Muhammad, the *Bugum* (Fire) *festival* which marks the beginning of the lunar year and commemorates the return of an ancient king who was lost in the wilderness and involves a procession with fire torches, the *Kobine festival* celebrated by the people in the Upper West Region, that marks the end of the farming season. The *Fao Festival,* is celebrated by the Grunni people of Bolgatanga in the Upper East Region to thank the gods for a good harvest, and the *Samanpiid festival* is celebrated by the

Kusasi people in Bawku in the Upper East Region, to thank the gods for a bountiful harvest and to pray for good rains in the coming year.

1. Value of Provisioning Services in Traditional Festivals

Festival celebration in the northern region involves feasting, where livestock such as cattle, sheep, and goats are slaughtered for communal meals (Damba Festival). These animals are raised using local grazing lands and water sources, both critical ecosystem services.

In other festivals such as the harvest celebration (Fao festival) in the Upper East Region, the bounty of crops such as millet, maize, groundnuts, and beans plays a central role. These crops are grown using the fertile soil, sunlight, and water provided by the local ecosystem. The food harvested is used in communal feasts and offerings during the festival. These food items are obtained from local crops and livestock grown and reared and depend on healthy ecosystems for production.

Along the river basin in the Upper West region, whereKobine Festival, is celebrated, crops like millet, maize, yams, and groundnuts are used. These crops also grown due to the presence of fertile soil, water, and sunlight in the river basin, are harvested and used for the celebration during the festival. Dishes prepared for festival celebrations are of different types (rice balls, jollof, sliced boiled yam, rice and beans (Waakye), pounded yam (fufu), Tuo Zaafi (TZ), traditional food, etc.) Condiments from the ecosystem such as dawadawa, shea butter, vegetables and leafs are used. In some communities foreign condiments (maggi etc.) not found in the ecosystem are prohibited.

Water is essential for making meals, drinking, performing rituals, and maintaining hygiene during the festival. It is sourced from local rivers, wells, or boreholes which are supported by the region’s ecosystems. It is typically sourced from local rivers, wells, or boreholes in the ecosystems. The environment sourced from the local rivers, wells, or boreholes, is maintained in healthy ecosystems.

Livestock such as goats, sheep, and chickens are raised for sacrifice or consumption during the festival. The animals depend on grazing lands and water sources provided by the environment.These livestock are reared within the community and are often sacrificed or prepared for the festival's meals. The small ruminants depend on fodder from stream banks (Plate 9) and water from the streams, which are important provisioning services.

Plate 9: Harvesting Fodder at Stream Bank (Photo: Bizoola. 2022)

Plate 10: Feeding Livestock at Home (Photo: Bizoola. 2022)

Small ruminants (goats, sheep) are kept by men and women but are tethered at home (Plate 10) large ruminant such as donkeys and horses are not tethered but are rather sent to the grazing sites by herdsmen. This is because of the luxuriant grasses in these landscapes. However, because of the large numbers of cattle and sheep,Fulani herdsmen are contracted to herd this group of livestock to the river or stream banks.

2. Values of Sacred Groves, Shrines and Shrubs in Religious Festivals

Sacred groves and sites are natural areas that are considered to have spiritual significance and are used for prayers, rituals, and other ceremonial activities during festivals. These sites are part of the cultural ecosystem services that support spiritual well-being. Festival is a cultural service, whichpreserves and transmits traditional knowledge, practices, and values. The natural environment often plays a role in the stories, songs, and dances performed during the festival.The festival (e.g. Bugum Festival) is a key cultural ecosystem service, preserving and celebrating the historical and spiritual heritage of the Dagomba people. The festival helps maintain social cohesion and the transmission of cultural values. Rituals and prayers at specific natural sites made at places considered sacred by the community. These rituals and prayers contribute to the spiritual and cultural significance of the people(Etikpah, 2015).

Spiritual and religious significance involves thanking the gods and ancestors for a good harvest and seeking their blessings for the coming season (Fao Festival). Sacred groves include shrubs, specific trees, water bodies, stones, etc. serve as sites for prayers and sacrifices, indicating the spiritual connection with nature.

Shrines and sacred groves are found in all landscapes along the river courses and in the uplands, there were however no sacred groves in the upstream, midstream and downstream ecosystems but symbols of status (wood carvings, stones, and clay) are used to serve as the shrines. Sacred groves are destroyed during development such as irrigation facilities but objects representing shrines are allowed to be removed and later replaced after the development was completed.

Cultural identity and tradition is a very important cultural event that helps preserve people's identity (Grunni Citizens and Kobine celebrants), passing down traditional practices, songs, dances, and rituals that are often tied to the natural environment. Cultural identity is a key cultural event that strengthens people’s identity and heritage. Traditional music, dances, and rituals performed during the festival often use local materials, such as drums made from animal skins and wood. These cultural practices are deeply connected to the natural environment. This

festival also expresses gratitude to the gods and ancestors for a successful harvest and reflects the community's spiritual connection to the land.

Communal fishing and hunting (‘*ritual fish-hunts*’ in some communities) are common practices in rural communities in northern Ghana. The string pools of water in river/stream courses and savannah grassland offer good opportunities for fishing and hunting.

Communities within close neighbourhoodswith the same values, norms, and values meet for communal fishing usually in the dry season and women take part in the fishing. A proportion of the fish caught is usually given to the community Chief and his elders. Women’sfish catches are shared with the chief and elders, also an incentive particular type of fish (a delicacy in Northern Ghana) caught by a woman is not taken away but the same caught by a man is given to the chief. Fishing is not allowed in pools and rivers/streams that are in sacred groves.

Fortunately, the hunting grounds of communities within the landscapes are outside the game reserves between the Mole Game reserve in Ghana and Burkina Faso where hunting is permitted. Communal hunting involves all communities in a landscape and even bigger towns such as Tamale and Navrongo. A community going for hunting informs its neighbours and distant communities on the date, time, and location where the hunting is to take place (Plate 7). After a hunt, a proportion of the meat is given to the chiefs of the communities that organised the hunt. Women do not take part in hunting and sedentary hunting is allowed only in the rainy season.

Plate 11: Hunters gathering for a hunting expedition (Photo: Bizoola, 2022)

3. Ecosystem Supporting Services

Ecosystems play a vital role in regulating local climate by essential for predictable growing seasons, which are crucial for the cultivation of important healthy crops and livestock that are used during celebrations. Biodiversity supports a variety of plant and animal species that provide communities with a wider range of crops, craft wood livestock, etc. for specific materials required for celebration and increasing their resilience to environmental changes.

Natural processes like the decomposition of organic matter and the weathering of rocks contribute to soil formation. Healthy soil is derived from the above decomposition to provide essential nutrients and support plant roots. The festival’s traditional costumes, drums, and other instruments are products obtained from the ecosystem as the source of locally sourced materials

like animal skins, wood, and plants. The diversespecies in the ecosystem provide the resources needed for these cultural festival needs.

Local plant diversity provides materials such as grasses for making torches, fodder for livestock (animal skins) for traditional attire, and plants for various ceremonial uses, the availability of these natural resources is crucial for traditional processes. Natural processes such as nutrient cycling and the presence of healthy soil micro-organisms are essential for successful agricultural activities.

Biodiversity in the White Volta River Basin provides resources for making traditional attire, instruments, and other items used during the festival. Plants, animals, and other natural resources play a vital role in the festivals ceremonies and celebrations.

Ecosystem-supporting services are crucial for rural farmers, especially in agricultural communities. These services are the natural processes that help maintain the environment in a way that supports farming activities.Many crops rely on pollinators like bees, butterflies, and other insects to reproduce. Healthy ecosystems support these pollinators, leading to better crop yields for farmers.

Ecosystems recycle nutrients like nitrogen, phosphorus, and potassium, which are essential for plant growth. This natural recycling reduces the need for chemical fertilizers and helps maintain soil health.

Natural ecosystems regulate water cycles, ensuring that water is available for crops when needed. Wetlands, forests, and other natural areas help store and filter water, reducing the risk of drought and floods, biodiversity ecosystems also contain natural predators that control pest populations. This reduces the need for chemical pesticides, which can be harmful to the environment and human health.

4. Regulating Services

The local climate, influenced by ecosystems, plays a role in determining the timing and nature of the festival activities, which are often held outdoors. Healthy ecosystems is required for the natural purification of water sources used during the festival, ensuring that the water is safe for consumption. Healthy ecosystems help regulate the availability and quality of water, which is essential for both agricultural and ceremonial uses during the festival. Wetlands, forests, and rivers play a role in maintaining water supplies.

Ecosystem services are integral to the successful celebration of the festival, highlighting the deep connection between cultural practices and the need fora natural environment. Festival is influenced by the local climate, particularly the dry season when it is easier to gather materials and there arefewer agricultural activities. The climate also influences the period of a festival celebration as most of the activities are outdoor nature. Traditional knowledge and practices

related to fire use and control (e.g. Bugum festival), supported by the local ecosystem, are essential during the festival to prevent wildfires and manage the torch procession safely.

The fertility of the soil, which supports the growth of crops, is a key ecosystem service that enables the harvest to be celebrated. The health of the soil, maintained through natural processes like nutrient cycling, is crucial for a successful agricultural season. The local biodiversity provides materials for making traditional attire, decorations, and musical instruments used during the festival. Plants and animals in the surrounding environment are also used in various rituals and ceremonies.

The timing of festivals is influenced by the local climate, especially the patterns of rainfall that affect crop growth. Prayers for good rains in the future highlight their dependence on the natural climate-regulating services provided by the ecosystem. Ecosystems help regulate the availability and quality of water, ensuring that there is sufficient water for both agricultural and ritual use during the festival. Wetlands, rivers, and forests all play roles in maintaining water supplies.

Climate Regulation-: The timing and success of the harvest, and thus the Kobine Festival, are closely tied to the local climate, particularly rainfall patterns. The festival often includes prayers for favorable weather in the coming year, underscoring the community's reliance on natural climate regulation.

Land and its resources are entrenched in the traditional common property system and vested in either the community chief, family head, or clan head depending on the ethnic group in the White Volta Basin. Ecosystems and ecosystem services in communities are managed by traditional institutions using traditional norms. Land and its resources are regarded as the identity community and are therefore well protected in all the communities (Lund, 2010) but the management of the resources is different in the communities due to the different tenurialsystems. Lands and its resources in the basin are generally not sold, but a token 'cola nut' is taken as a sign of agreement for its use and may be taken back any time the owner decides.

Access to ecosystem services in the White Volta Basinvaries,in the upstream and downstream ecosystems.In the downstream a shrub known as 'Nyoo' used by women as chewing-stick is very common and in the upstream of the basin blackberry and red berry ('Sibisibi'- a hunger relieving fruit) loved by children is also very common.

Communities in within close neighbouringcommunity wishing to embark on communal fishing invites the other communities for the festival. This activity is always in the dry season and women are allowed to take part. A proportion of the total fish caught is usually given to the community chief and his elders. Apart from the women's catch not being added to the proportion to be givento the chief, a particular type of fish caught by a woman is not taken away but by a male who catches this fish is given to the chief. Fishing is not allowed in rivers/streams or standing water by sacred groves.

Conclusion

Recreational experiences, religious values, educational opportunities, cultural heritage, and traditional practices and knowledge are associated with managing natural resources in our environments.Indigenous ways of managing land and resources enhance the sustainable resource use and contribute to the well-being and rural livelihood that depend on ecosystem services. Traditional festivals celebration enriches cultural heritage,use of the rich and luxuriant vegetation of the ecosystem services is made. Customary laws, traditional social structures, and traditional management and regulationof the use of natural resources and ecosystem services at the rural local level are reinforced. Apart from their social responsibilities in the community, sub-chiefs ensure sustainable use of resources in the ecosystem under their jurisdiction. Research in ecosystem services requires the involvement of community members with good knowledge of the landscape. Damba, Bugum, Fao, and Samanpiid festivals are among the major festivals celebrated in Northern Ghana. Provisioning and cultural ecosystem services are very relevant in the celebration of festivals in Northern Ghana. Heritage and identity as a member of the community are the main goals of the celebration. Activities found common festivals is prayers to the gods and ancestors for good harvests and blessings. Rituals performances at sacred sites, and maintains social cohesion and the transmission of cultural values.

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