

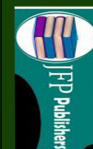
The conservation of biodiversity in Ghana require pluralistic approaches from the concerted efforts of scholars in the diverse academic disciplines. This document offers a complementary lens to arrest the biodiversity depletion menace in Ghana using the sound conservation ethos latent in traditional knowledge systems of Ghana. This traditional biodiversity conservation strategy when used in conjunction with the purely scientific conservation models would offer a more robust and multidisciplinary approach to arrest the menace of biodiversity degradation in Ghana.

This document offers policy directions on how the traditional ecological wisdom enshrined in the cultural and artistic practices of Ghana could be pronounced and mainstreamed into the laws promulgated to protect Ghana's rich biodiversity resources. This would invariably aid in the preservation, transmission and acknowledgement of the treasured traditional knowledge systems for biodiversity use and management in Ghana.

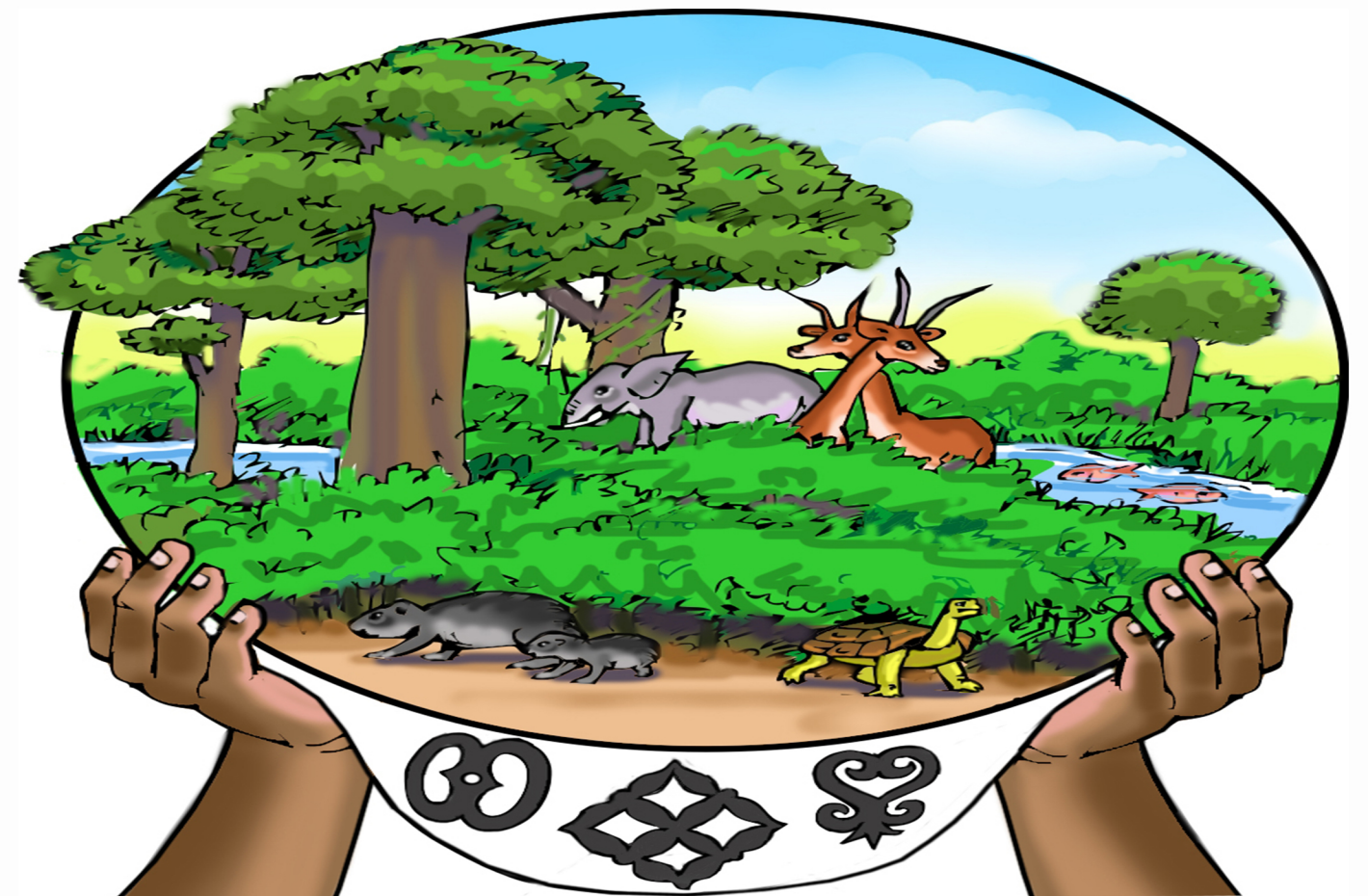
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ADOM  
Traditional Biodiversity Conservation Strategy for Ghana



# TRADITIONAL BIODIVERSITY CONSERVATION STRATEGY FOR GHANA



DICKSON ADOM

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## DEDICATION

To all lovers of nature who acknowledge, respect and utilize indigenous knowledge systems

This document won an innovative award in the category of sound and sustainable environmental protection approaches from the field of Humanities and Social Sciences at the RUFORUM (Regional Universities Forum for Capacity Building in Agriculture-A consortium of 114 universities from 38 African countries) 15th Annual General Meeting held on 6th December 2019 with a cash value of \$2000.



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### **Journal Publications from the research toward this document**

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2. Adom, (2019). Dietary Taboos as a Means of Ethnic and Place Identity of the Bono People of Ghana: Indirect Cultural Practices for the Conservation of Fauna Species. *International Journal of Conservation Science*, 10(4): 733-748
3. Adom, D. & Boamah, D. A. (2020). Local Attitudes toward the Cultural Seasonal Hunting Bans in Ghana's Bomfobiri Wildlife Sanctuary: Implications for Sustainable Wildlife Management and Tourism. *Elsevier's Global Ecology and Conservation*, 24 (e01243): 1- 13
4. Adom, D. (2018). Traditional Cosmology and Nature Conservation at the Bomfobiri Wildlife Sanctuary of Ghana. *Nature Conservation Research*, 3(1): 23-44
5. Adom, (2017). Promoting Cultural Traditions, Social Inclusion and Local Community Participation in Environmental Development Schemes. *Journal of Urban Culture Research*, 14(1): 80-103
6. Adom, D., Sawicka, B., Umachandran, K. & Ziarati, P. (2020). Effective Approaches

in Ensuring the Active Involvement of Local People in Biodiversity Conservation Projects. *International Journal of Basic & Applied Sciences*, 20(2): 17-31

7. Adom, D., Appiah, P. S. & Yarney, L. (2019). A Return to the Ghanaian Cultural Values of Closed Season in Ghana's Artisanal Marine Fishing: An Essential Means of Restoring Small Pelagic Stocks. *Rev. Syst. Ecol. Res.*, 21(3): 95-110

8. Adom, D. (2018). The Human Impact and the Aquatic Biodiversity of Lake Bosomtwe: Renaissance of the Cultural Traditions of Abono (Ghana)? *Transylvanian Review of Systematical and Ecological Research*, 20(1): 87-110

9. Adom, D. (2017). Strategic Adaptation of Traditional Festivals for the Sustainable Development of the Biodiversity of Local Communities in Ghana. *Open Journal of Social Sciences*, 5(11): 69-94

10. Adom, D., Asante, E. A., Kquofi, S., Arthur, N. A. P. (2018). The Conservation Ethos in the Asante Cultural and Artistic Elements for the Management of Ghana's Biodiversity. *International Journal of Humanities and Social Sciences Review*, 4(3): 1- 22

11. Adom, D. (2016). Cultural Festival as a Salient Tool for Strategic, Holistic, and Sustainable Rural Development in Africa: The Case of the Opemso) Festival of the Asantes of Ghana. *Advances in Social Sciences Research Journal*, 3(11): 4-20

12. Adom, D., Asante, E. A., Arthur, N. A. P. & Boadu, K. (2018). Investigation of the Cultural and Artistic Elements in the Biodiversity Policies and Strategies in Ghana. *Journal of Biodiversity Management and Forestry*, 7(2): 23-47

13. Adom, D., Kquofi, S. & Asante, E. A. (2016). The High Impacts of Asante Indigenous Knowledge in Biodiversity conservation issues in Ghana: The case of the Asante Bekwai Traditional Area, *British Journal of Environmental Science*, 4(3): 63-78

14. Adom, D. (2018). Traditional Biodiversity Conservation Strategy as a Complement to the Existing Scientific Biodiversity Conservation Models in Ghana. *Environment and Natural Resources Research*, 8(3): 1-24

15. Adom, D. (2016). Inclusion of Local People and Their Cultural Practices in Biodiversity Conservation: Lessons from Successful Nations, *American Journal of Environmental Protection*, 4(3): 67-78

16. Adom, & Dzakpasu, P. E. (2017). Cultural Practices of Local Communities as a Biodiversity Managerial Strategy for Ghana's Environment: A Retrospection of International Conventions, *International Journal of Scientific Research*, 6(5): 332- 341

17. Adom, D., Opoku, M., Newton, J. P. & Yeboah, A. (2018). Adinkra Cultural Symbols for Environmental Sustainability Education in Ghana. *World Environment*, 8(2): 36- 46

18. Adom, D. (2016). The Philosophical Epistemologies of Asante Proverbs in Ghana's Biodiversity Conservation, *Journal of Environment and Earth Science*, 6(7): 32- 47
19. Adom, D. (2017). Challenges to the Efficacy of Forestry and Wildlife Policies in Ghana for Environmental Protection: A Review. *African Journal of Agricultural Research*, 12(39): 2858-2876
20. Adom, D., Umachandran, K., Boamah, D. A., Ziarati, P. & Sawicka, B. (2019). The Concept, State, Roles and Management of Protected Areas in Ghana: A Review. *Acta Scientific Agriculture*, 3(1): 68-76
21. Adom, D., Appiah, P. S. & Adam, S. (2019). Ecological Restoration of Degraded Areas in Rural Regions: A Synergy of Scientific and Traditional Ecological Restoration Strategies. *Agriculture and Food: e-Newsletter*, 1(6): 13-23
22. Adom, (2019). Indigenous Knowledge for Environmental Sustainability Education in Ghana: Myths. *Agriculture and Food: e-Newsletter*, 1(3): 43-45
23. Adom, D., Umachandran, K., Ziarati, P., Sawicka, B. & Appiah, P. S. (2019). The Concept of Biodiversity and Its Relevance to Mankind: A Short Review. *Journal of Agriculture and Sustainability*, 12(2): 219-231
24. Adom, D. (2016). Asante Indigenous Knowledge Systems: Repositories of Conservation Ethics for Ghana's Biodiversity. Proceedings of The Academic Conference of on Interdisciplinary Approach Vol. 7 No. 2. 4th August, 2016- Uthman Danfodio University, Sokoto, PTF I Hall, Sokoto, Sokoto State, Nigeria
25. Adom, D. (2021). The Sustainability of the Science in the Productive Cultural Instruments of African Ancestors for Natural Resource Management. *Journal of African Art and Culture*, 5(1): 45-71.

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## PREFACE

Biodiversity management in Ghana has been largely driven by scientific conservation models. The time-tested and useful traditional conservation ethos in the Ghanaian cultural and artistic elements such as festivals, proverbs, cosmological belief systems and taboos are often watered down by conservationists in biodiversity conservation schemes. This is due to conservationists' lack of clear-cut guidelines on how to effectively utilize the traditional knowledge systems in complementing the scientific conservation models they are well versed. The developed traditional biodiversity conservation strategy was based on the findings from a robust phenomenological study conducted among purposively and randomly sampled key stakeholders in biodiversity management in the Ashanti Region of Ghana. The document aims at offering comprehensive information and guidelines to conservationists on effective ways of implementing traditional knowledge systems in biodiversity conservation issues in Ghana. It ultimately aims at filling the dearth in traditional knowledge systems that have been an age-long problem for the conservation ministries and agencies in Ghana. The information presented in the traditional biodiversity conservation strategy would offer another lens to addressing conservation issues in Ghana while acting as a viable complement to the scientific models. This would ultimately maximize and enrich the conservation strategies for managing Ghana's biodiversity.

This document reveals the valuable information inherent in the Ghanaian indigenous knowledge systems that have been in use for the promotion and conservation of Ghana's biodiversity. This knowledge would help in the preservation, transmission and acknowledgement of the traditional ecological and conservational wisdom in these practices which are constantly under severe threat of extermination. Also, it would serve as a sensitization tool and a wakeup call to the general public on the extreme dangers that negative attitudes are causing to the biodiversity in the country and how they can shun these negative attitudes by implementing the values in the indigenous knowledge systems so as to conserve biodiversity in Ghana.

Moreover, the document would equip the various bodies involved with the formulation of biodiversity conservation policies and strategies in Ghana and the world at large. The document would for instance equip the tourism sector in Ghana, The Ministry of Environment, Science, Technology and Innovation, The Ministry of Lands, Forestry and Mines, Friends of Rivers and Water Bodies, The Forestry Commission of Ghana, the National Biodiversity Committee and other Non- Governmental Organizations with effective conservation strategies driven by Asante cultural and artistic elements. This traditional biodiversity conservation strategy when coupled with the scientific conservation practices can strengthen the remedies for the ever-devastating state of Ghana's biodiversity impacting greatly on the socio-economic development of Ghana.



Finally, the document would generally help in the conservation and sustainability of the rich biological diversities in the biosphere that provides significant assistance to the livelihood and survival of humankind as well as making these resources available for posterity.

## INTRODUCTION

Biodiversity conservation has been a major priority of governments globally because of the alarming rate of biodiversity depletion. This menace in biodiversity has raised serious eyebrows among conservation agencies and global networks responsible for the protection of the biological diversity. The United Nations have earmarked a decade from 2011-2020 as the world's decade on biodiversity protection (Bettson, 2010). Also, member countries of the United Nations recently signed and ratified the Convention on Biological Diversity Aichi Targets to help bolster the strategies taken by member countries in conserving the rich bio-resources in nature. These attempts are crucial and indispensable due to the pivotal and non-exchangeable roles that biodiversity plays in the lives of humans. There is therefore the call for multi-faceted strategies to help in arresting the biodiversity depletion canker. There is the search for these pluralistic strategies from various streams of knowledge, unlike the previously often biased truncated approach to scientific conservation strategies. Thus, there is a realization of the worth of conservation ethos in the traditional ecological knowledge systems which are usually in the preserve of local communities of countries. As a result, many countries are now seriously researching into how the traditional wisdom regarding the use and conservation of resources and how they can be used to complement the often-emphasized scientific conservation practices which are equally relevant. Many countries have set examples worth emulating in the utilization of traditional wisdom latent in the cultural and artistic elements of the people, such as their cosmological beliefs, taboos, proverbs, myths, folklore and so forth. Countries that have taken these giant and relevant steps in integrating traditional knowledge into their modern scientific models of conservation have attained a great degree of successes. They include Brazil, China, India, Japan, Kenya, Angola and Tanzania (For extensive information read Adom, 2016b). These countries have used traditional conservation practices' education and awareness campaigns, documentation, active participation of the stakeholders of the traditional wisdom, and many other strategies. This has aided in the recognition, appreciation, and promotion of traditional conservation practices evident in the cultural and artistic elements of their people. This is in fulfillment of the Aichi target 18 that instructed signatory nations that 'By 2020, the traditional knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the convention with the full and effective participation of Indigenous and local communities, at all relevant levels' (CBD, 2010, Article 18). The precepts set by the already cited countries and their allied benefits show clearly the need for countries with rich sources of traditional knowledge such as Ghana to consider developing a robust traditional conservation strategy as a viable complement to the scientific conservation practices that seem very populous in the management of her biological diversities.

**Defining the Problem that necessitated the Development of  
the Traditional Biodiversity Conservation Strategy**

Ghana is a country with rich traditions and a robust cultural heritage. Her cultural buoyancy is remarkable and has been enviable on the African continent and among her global contenders. The genius forebears in Ghana cleverly established, instituted, initiated and observed several forms of cultural and artistic elements that were latent with rich traditional wisdom and ethos that ensured the development of self and the Ghanaian community as a whole. Interestingly, these creatively fashioned cultural and artistic elements that form part of the life experiences of the Ghanaian people hold great benefits today even in the face of astronomical development in the field of science and technology. The unique roles that they play in the society are tremendously relevant in maintaining peaceful relations between the Ghanaian people and their environment. These rich cultural and artistic elements include the cosmological belief systems of the Ghanaian people, the observation of taboos, the celebration of festivals, the deep pondering and use of proverbs for education and many others. These cultural and artistic elements have a great worth of traditional conservation knowledge for the management of biodiversity. In fact, they were and are still potent strategies used for the conservation of biodiversity. Many of the tracts of lands in Ghana that have been maintained in their pristine forms have resulted from the promulgation of the resilient cultural and artistic elements by various communities in this country. It is quite unfortunate that the policies and strategies for biodiversity in Ghana have not exemplified these cultural and artistic elements to make their application in the management of biodiversity less cumbersome. Ghana has been carried away more in the scientific conservation practices, relegating and/or minimizing the great potentials in the traditional conservation knowledge in the conservation of her biodiversity resources. The recently released National Biodiversity Strategy has highlighted the need for a documentation of all traditional, biodiversity-related knowledge systems with the aim of integrating it into appropriate scientific conservation models to hone the conservation efforts of Ghana's biodiversity.

This document was skilfully put together via a thorough research with the sole aim of offering a solution to this dearth in the traditional knowledge of conservation in Ghana. This traditional biodiversity conservation strategy is not a substitute to the existing biodiversity-related policies in this nation. Rather, it is a clear and easy guide to the great worth of conservation ethos in the unmatched cultural and artistic elements of the Ghanaian people. It is to serve as an alternative in beefing up the often-neglected traditional knowledge systems in the existing biodiversity-related policies and strategies in Ghana. The document shows practical and efficient ways that the traditional knowledge systems in Ghana could be harnessed in heightening conservation efforts in Ghana to avert the biodiversity menace in Ghana. It offers a clear and explicit guide to project officers and conservationists in the field on how to bolster conservation efforts using the traditional knowledge systems evident in the cultural and artistic elements of the Ghanaian people. As said earlier, this traditional conservation strategy is a complement to the scientific conservation models used in Ghana. This document is a product of the phenomenological

study earlier conducted by the researcher (Refer to Adom et al., 2018). As such, each of the components of the strategy shows which aspect of the scientific strategy or existing biodiversity policy or strategy it is complementing.

All aspects of the strategy that have been formulated by the present researcher, espouse the dictates of international conventions and treaties that Ghana has signed and ratified related to traditional ecological knowledge. The conventions and treaties include the Assisi Declaration of Religion and Nature (1986), Indigenous and Tribal Peoples Convention (1989), 1992 United Nations Conference on Environment and Development, Agenda 21 United Nations Decade for Sustainable Development (UNDESD, 2005-2014), Desertification Convention (1995), the Strategic Plan for Biodiversity 2011–2020 and the AICHI Biodiversity Targets and the UN Declaration of the Rights of Indigenous People (2006). It also takes cognizance of all existing national legal instruments including the Biosafety Act (2011), Ghana Forest and Wildlife Policy (2012), Forest Protection Decree, 1974 (NRCD 243), Trees and Timber enr.ccsenet.org Environment and Natural Resources Research Vol. 8, No. 3; 2018 3 Decree, 1974 (NRCD 273), Forest Protection (Amendment) Law, 1986 (PNDCL 142), Forestry Development Master Plan (2016 -2036), Timber Resource Management Act, 1997 (Acts 547), Environmental Assessment Regulation, LI 1652 (1999), National Land Policy (June 1999), Minerals and Mining Act (2006), National Water Policy (2007), Ghana National Climate Change Adaptation Strategy (2010), National Climate Change Policy (2013) and National Environment Policy (2014), the 2002 National Biodiversity Strategy and the 2016 National Biodiversity Strategy and Action Plan. The new, formulated conservation strategy by the writer of this paper, makes great allusions to efficient traditional conservation practices of other global countries and justifies why and how Ghana can utilize them, though, in Ghanaian local contexts in the management of her biodiversity. The National Biodiversity Strategies of countries such as Brazil, Japan, China, India, Tanzania, Kenya and Angola have been referred to in the new strategy formulated by the present researcher for special lessons in traditional biodiversity management in Ghana. The traditional strategy reflects on the humanist ecology that Ghana has now adopted (Ghana NBSAP, 2016), which looks at culture as helping the members in the Ghanaian society to cultivate the needed qualities to play the roles that we have toward nature. As such, the formulated traditional biodiversity conservation strategy utilizes the ideals expressed in the culture theory and the Human-Environment Relation (HER) theory.

These theories posit that human cultures, especially, their cultural and artistic elements such as festivals, taboos, cosmological belief systems and so forth exert a great influence on the environment and could be utilized effectively in promoting the conservation of the biodiversity resources in it (Ingold, 1992; Milton, 1996). The formulated traditional biodiversity conservation strategy reveals from the perspective of the owners of the cultural and artistic elements, how they could be harnessed in boosting conservation efforts in the management of biodiversity

in Ghana, hence, rooting this developed strategy in the interpretive philosophical paradigm (Angen, 2000). The developed traditional biodiversity conservation strategy is aimed solely at beefing up the existing biodiversity conservation strategy in Ghana by utilizing the cultural conservation values (Mertens, 2007) latent in the cultural and artistic elements of the Ghanaian people (traditional knowledge systems). This is envisioned to result in social change (Silka, 2005), thus, the transformation of the dire state of biodiversity conservation issues in Ghana. This justifies the use of the transformative philosophical paradigm in addition to the interpretive philosophical paradigm as the backbone for the development of the traditional conservation strategy.



## **Theoretical Methods**

The development of the traditional biodiversity conservation strategy is solidly based on the phenomenological study (Pietkiewicz & Smith, 2014) of the cultural and artistic elements in the biodiversity policies and strategies in Ghana. Also, the study highlighted the pivotal roles of cultural and artistic elements like cosmological beliefs, proverbs, taboos, totems and festivals in biodiversity conservation in Ghana. This research design was very appropriate for the study since the study aimed at exploring in great detail (Fraenkel et al., 2012), the implementation of cultural and artistic elements from a 112 purposively and stratified random sample. This sample consisted of Ninety-two (92) of the accessible population consisted of traditional authorities, traditional priests/priestesses, elders in the traditional council, as well as elderly members in the fringe communities with the age of fifty and above availed themselves for the personal interviews and the Focus Group Discussion. Also, fifteen (15) conservationists from the Resource Management and Support Centre (RMSC) of the Forestry Commission, Forestry Research Institute of Ghana (FORIG), Environmental Protection Agency (Ashanti Region), park officers in the Protected Areas for the study as well as five (5) culturists formed part of the accessible population. Focus Group Discussions (Pope et al., 2000), private interviews (Leedy & Ormrod, 2010) as well as non-participant or complete observer and an observer-as-participant (Kumekpor, 2002; Lacono et al., 2009) were the main data collection instruments used in soliciting the data for the development of the traditional biodiversity conservation strategy. Policy documents, papers and reports on biodiversity in Ghana and other countries were thoroughly reviewed and analyzed via the interpretive document analysis method (Bowen, 2009) to unearth the incorporation and/or relevance of cultural and artistic elements in biodiversity management. The generated data were analysed using the principles in the Interpretative Phenomenological Analysis (Smith & Osborn, 2008), Interpretive Policy Analysis (Yanow, 2000; Morestin, 2012; Bardach, 2012), and the Conservation Values Analysis of Traditional Knowledge Systems (Smith & Wishnie, 2000).

## **The Vision and Aim of the Traditional Biodiversity Conservation Strategy**

The sole vision and aim of the traditional biodiversity conservation strategy are to expose the astronomical worth of conservation ethos in the cultural and artistic elements of the Ghanaian people to boost conservation efforts of biodiversity in the country. This is to aid in augmenting the efforts achieved in the conservation of biodiversity using the scientific conservation models. It is also aimed at fulfilling Ghana's international obligations in the global biodiversity conventions she has signed and ratified. The vision and aim of the traditional biodiversity conservation strategy partly reflect the vision of the 2016 National Biodiversity Strategy in Ghana, the ninth guiding principle in the NBSAP of Tanzania and the article 18 of the Strategic Plan for Biodiversity 2011-2020 and the Aichi targets, all calling for a recognition and integration of traditional knowledge systems in biodiversity conservation for the general good of all citizenry of a country. Therefore, the vision of this traditional biodiversity conservation strategy is to:

Offer a clear direction on how to utilize the Ghanaian traditional knowledge systems in the cultural and artistic elements of the Ghanaian people in boosting the conservation of biodiversity while serving as a viable complement to the existing scientific conservation models so that the traditional knowledge, cultural practices and innovation would be recognized, respected, and its integration enhanced in modern biodiversity conservation efforts in Ghana to ensure equitable sharing of costs and benefits accrued for the wellbeing, prosperity and security of all Ghanaians.'

The Traditional biodiversity conservation strategy is aimed at:

'Developing innovative strategies for adapting the cultural and artistic elements in Ghana as a viable complement to the scientific conservation models such that these traditional knowledge systems are recognized, respected and integrated into biodiversity management in Ghana.'

## **Guiding Principles of the Traditional Biodiversity Conservation Strategy**

The development of the traditional biodiversity conservation strategy is underpinned and supported by various theories in traditional knowledge systems and the quintessential roles they play in biodiversity management. The ten theories that undergird the developed traditional biodiversity conservation strategy are:

- Integrating traditional knowledge systems into the planning and management of biodiversity provides practical lessons in addressing the current and future challenges associated with biodiversity (Infield & Mugisha, 2013).

- Traditional Knowledge Systems such as taboos, cosmological belief systems, myths, folklore have a high impact on the management and conservation of biodiversity in the face of modernity (Adom, Kquofi & Asante, 2016).

- A culture-driven management and conservation strategy for biodiversity has been endorsed to be very successful because of its promotion of social inclusiveness, resilience, cooperation and innovation in local communities (UNESCO, 2012).

- The cultural and artistic elements in most African communities are environmentally-friendly, sustainable, prevent resource exploitation and have contributed greatly to biodiversity conservation (IIED, 1992; Kenya NBSAP, 2000; UNESCO, 2003).

- A truncated approach to the use of only scientific conservation models would not achieve the maximum successes in biodiversity conservation (Golo & Yaro, 2013; Sinclair, Tuke & Opiang, 2010).

- Traditional Knowledge systems possess robust behavioural corrective elements and create a strong moral economy for society members in advancing the course of the humanist approach to biodiversity conservation, inciting them in pursuing bio-friendly activities (Materer, Valdivia & Gilles, 2002).

- Indigenous flora and fauna species and rich habitats of biodiversity have been intertwined in customs, cultural beliefs and practices to ensure their conservation and sustainable use in many societies globally (Wilder, O'meara, Monti & Nabhan, 2016).

- Traditional knowledge systems have scientific philosophical underpinnings that are in harmony with the scientific conservation models for biodiversity conservation (Awuah-Nyamekye, 2013; Adom, 2016a).

- Integration of both scientific and traditional knowledge systems provide a pluralistic, holistic and more flexible approach and better results in addressing the challenges in biodiversity conservation (Sinclair et al. 2010; Attuquayefio & Fobil, 2005; Johnson, 1992; Wilder et al. 2016).

- Scientific conservation models and traditional conservation practices must be seen as



complements and co-equals with no devaluing of each of the streams of knowledge with the recognition that each possesses distinct elements and values relevant to biodiversity conservation (Ajani, Mgbenka & Okeke, 2013; Berkes, 2012; Msuya & Kideghesho, 2009; Iyoro & Ogungbo, 2013).

## **Objectives of the Traditional Biodiversity Conservation Strategy**

The following six strategic objectives of the traditional biodiversity conservation strategy would help Ghana to fully fulfil her international and national obligations regarding the integration of traditional knowledge systems in biodiversity conservation programmes and activities:

1) to innovatively utilize taboo systems in addressing the challenges in the depletion of threatened species in Ghana;

2) to strategically adapt all traditional festivals in Ghana as occasions for engaging in environmentally-friendly activities that bolster conservation efforts in Ghana;

3) to creatively build on the cosmological belief systems of the Ghanaian people in promoting conservation interests of biodiversity in Ghana;

4) to create public awareness, sensitization and education on the value of traditional biodiversity conservation, restoration and sustainable usage using the proverbs in Ghana;

5) to ensure the active involvement and formalization of the owners of biodiversity and traditional knowledge systems in the formulation of policies, strategies and programmes on biodiversity conservation while ensuring fair and equitable distribution and rewards on the proceeds of biodiversity

6) to provide the needed education to fill the knowledge deficiencies in the use of cultural and artistic elements in biodiversity conservation among conservationists in Ghana as well as intensifying the education of scientific conservation practices in local communities

## **Key Components of the Traditional Biodiversity Conservation Strategy**

COMPONENT 1: Innovatively utilizing taboo systems in addressing the challenges with the depletion of threatened species in Ghana

COMPONENT 2: Strategically adapting all traditional festivals in Ghana as occasions for engaging in environmentally friendly activities that bolster conservation efforts in Ghana

COMPONENT 3: Creatively building on the cosmological belief systems of the Ghanaian people in promoting conservation interests of biodiversity in Ghana

COMPONENT 4: Creating public awareness, sensitizing and educating on the value of traditional biodiversity conservation, restoration and sustainable usage using the proverbs in Ghana

COMPONENT 5: Ensuring the active involvement and formalization of the owners of biodiversity and guardians of traditional knowledge systems in the formulation and implementation of policies, strategies and programmes on biodiversity conservation while ensuring fair and equitable distribution and rewards on the proceeds of biodiversity

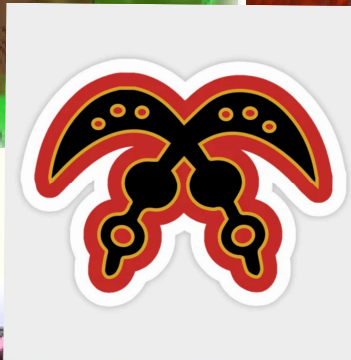
COMPONENT 6: Providing the needed education to fill the knowledge deficiencies in the use of cultural and artistic elements in biodiversity conservation among conservationists in Ghana as well as intensifying the education of scientific conservation practices in local communities

## COMPONENT 1

\*\*\*\*\*

**Innovatively utilizing taboo systems in addressing the challenges  
with the depletion of threatened species in Ghana**





## **Background**

**T**aboo systems have existed in Ghana for several centuries. They are very effective traditional institutions that have conserved many of the biological diversities in their pristine forms in Ghana. They are strong prohibitions that society members are supposed to observe. They offer the dos and don'ts in the Ghanaian society. Taboos serve as traditional checks and balances (Diawuo & Issifu, 2015) and act as viable ethical instruments for ensuring the good link between Ghanaians and their environment (Ababio, 2014). Rim-Rukeh, Ierhievwie and Agbozu (2013) opine that taboos have been the sole factor that has prevented abuse of resources and maintained the buoyancy of the biodiversity in Ghana. The numerous sacred groves and other Protected Areas have been conserved as a result of the taboo systems. The efficiency of taboos in the conservation of biodiversity is partly shrouded in its spiritual and physical consequences (Boateng, 1998; Asante, Adom & Arthur, 2017). Also, taboos have metaphysical openness and overridability (Osei, 2006) making it possible to set new taboos and revise existing taboos to reflect the current thinking and use in the Ghanaian society. For instance, new taboos can be set to ban the use of all threatened species of flora and fauna in Ghana.

Interestingly, the taboos set on particular biodiversity resources, the taboo days and closed seasons have ecological and scientific relevance to the conservation of biodiversity (Adom, Kquofi & Asante, 2016; Boamah, 2015). The globally successful countries in biodiversity conservation mentioned earlier have effectively utilized taboo systems. For instance, the biodiversity in many of the sacred groves in Kenya has been regulated by taboo systems (Infield & Mugisha, 2013). Likewise, China heavily relies on taboo systems in managing their sacred forests, mountains and water bodies (Xue, 2008; Adom, 2016b). Due to the strong impact of taboos in many forest fringe communities, it is imperative that Ghana utilizes it innovatively as have been done by other countries in promoting the conservation of biodiversity in Ghana. The suggested action plans 1-3 of the traditional biodiversity conservation strategy illustrate effective ways that taboos can be used in modern Ghana to heighten conservation efforts for biodiversity.

*Action Plan 1: Ensuring the full observance of all productive and biodiversity-friendly taboos that prevent resource abuse and unrestrained harvesting in Ghanaian communities*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/ Lessons from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Innovatively utilize taboo systems in addressing the challenges with the depletion of threatened species	Strictly observe all the taboos on sound environmental conservation ethics such as taboos against the unrestrained cutting of trees, bad farming practices such as bush burning, etc.	National Bio-Safety Risk Assessment Guidelines (NBSAP 2016)  Restrict exploitation of animals and plants by fixing quotas and sustainable removal figures (NBS 2002)	Using taboo systems in efficiently managing the sacred forests, mountains and water bodies in China  (China NBSAP 2011-2030)	Taboo systems used for biodiversity conservation strictly observed	Traditional Authorities in local communities  National Commission on Culture  Ministry of Environment, Science, Technology and Innovation  Department of Parks  Forestry Commission  Fisheries Commission  Wildlife Division	Local communities where taboo systems are very effective due to the robust traditional governance systems  Protected Areas in local Regions  Forest fringe communities in local communities	Daily

*Action Plan 1: Ensuring the full observance of all productive and biodiversity-friendly taboos that prevent resource abuse and unrestrained harvesting in Ghanaian communities*

<p>Innovatively utilize taboo systems in addressing the challenge of the depletion of threatened species from possible extinction</p>	<p>Properly orient and instruct visitors who visit Protected Areas with eco-tourism potentials in Ghana such as Lake Bosomtwe, Bomfobiri Wildlife Sanctuary etc. on the taboos regarding the biodiversity resources in the area.</p>	<p>Promote eco-tourism development (NBS 2002)</p>	<p>Tourists/visitors to Protected Areas must abide by the management and are liable to pay fees collected to aid in the conservation of biodiversity in the area (Guidance for planning and management of Protected Areas, WCPA 2002)</p>	<p>Visitors are properly instructed and oriented on taboos to be observed in all Protected Areas in Ghana</p>	<p>Ghana Tourism Authority Forestry Commission Wildlife Division Fisheries Commission National Commission on Culture Traditional Authorities MESTI</p>	<p>Protected Areas in Ghana Eco-Tourism sites such as Parks etc.</p>	<p>Daily</p>
<p>Impose and strictly ensure that penalties regarding the abuse of taboos on biodiversity are duly paid by culprits to serve as a strong deterrent for such actions.</p>	<p>Strengthen legal framework to give permanence to Protected Areas in order to conserve biodiversity in the country (GFWP 2012) Empower grass root administration structures to enact by-laws for the management, use and protection of biodiversity (NBS 2002)</p>	<p>Tourists/visitors to Protected Areas must abide by the management and fines imposed to aid in the conservation of biodiversity in the area (Guidance for planning and management of Protected Areas, WCPA 2002)</p>	<p>Traditional Authorities Law Courts Police Service Forestry Commission Wildlife Division National Commission on Culture Environmental Protection Agency</p>	<p>Local communities where taboos have high impact Protected Areas and their forest fringe communities</p>	<p>Daily</p>	<p>Daily</p>	



*Action Plan 2: Recognizing, promoting, observing, enhancing and legalizing taboo days and closed seasons that protect the biodiversity resources in Ghana*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/ Lessons from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Recognize, promote, observe and legalize taboo days and closed seasons that protect the biodiversity resources in Ghana	Enact specific laws to incorporate into forest laws, the closed seasons and taboo days that ensure the conservation of biodiversity	Enact specific legal provisions in the management of Protected Areas (Ghana FWP 2012) Traditional laws and sanctions that promote biodiversity conservation should be accorded legal backing to ensure effective enforcement (NBS 2002)	Set by-laws that are efficient for the management of biodiversity in Protected Areas (Guidance for planning and management of Protected Areas, WCPA 2002)	Closed seasons and taboo days are mainstreamed into forest laws	Traditional Authorities Forestry Commission Wildlife Division Local Government Service Legal Aid Ghana Judicial Service of Ghana	Forest Fringed Communities Protected Areas	Periodically

*Action Plan 3: Setting, legalizing and promulgating new taboos to prevent possible extinction of threatened species of biodiversity in Ghana*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/ Lessons from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Set, legalize and promulgate new taboos to prevent possible extinction of threatened species of biodiversity in Ghana	Set new taboos through a consensus between the traditional authorities and conservationists to avoid the exploitation of threatened species in the IUCN Red list and in nationally declared endangered species by the conservation agencies.	Regulation to protect endangered species (Ghana NBSAP 2016) Enforce the ban of all protected wildlife species in Ghana (Ghana FWP 2012)	Prevent the extinction of known threatened species and their conservation status, particularly, of those in high decline, and improving and sustaining their status CBD Aichi Target 12 (2011-2020)	New taboos set to avoid exploitation of threatened species of biodiversity in Ghana	Traditional Authorities Forest Commission Wildlife Division Local Government Service Legal Aid Ghana Judicial Service of Ghana Parliamentary Select Committee on Lands and Forestry	Forest fringe communities in Ghana Protected Areas	Periodically

## COMPONENT 2

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**Strategically adapting all traditional festivals in Ghana as occasions for engaging in environmentally friendly activities that bolster conservation efforts in Ghana**





## **Background**

**T**raditional festivals are important cultural events that elucidate the rich historical and iconic events of celebrant communities (O’Suvillan & Jackson, 2002). They are organized in lieu of venerating the ancestors and their great achievements that aided in the survival as well as the development of their societies. That notwithstanding, festivals are great events that exemplify the engagement in environmental activities that ensure the conservation of biodiversity in the host communities. During the event, Asante, Adom and Arthur (2017) contend that host communities engage in environmentally healthy activities such as massive cleaning of households and streets of the town, desilting of choked gutters, sweeping, planting of trees (Bonye, 2007), clearing of debris and all forms of refuse to maintain their place identity (Crespi & Richards, 2007) and honour the ancestors who are believed to visit the people during such occasions (Adom, 2016a). Aside from the environmentally friendly activities that lead to biodiversity conservation engaged in by local people during the festive celebrations, special gazette areas of sacred importance are earmarked for the celebrations. These sacred forests and groves are uniquely tied to the traditional festival observance. For instance, the Opemso festival of the Asantes of Anyinam-Kokofu is tied to the Kwantakese sacred grove, the Papa Nantwi Festival of the Kumawu people is associated with the Bomfobiri Wildlife Sanctuary and the Nkyiridwo festival of the people of Essumeja is linked to the Asantemanso Sacred Grove.

Thus, the promotion of these traditional festivals in Ghana ensures the reaffirmation of the cultural beliefs that led to the earmarking of such spots as sacrosanct and lead to the protection of the areas from any form of encroachment. These sacred sites are hotspots for rich diversities of biological diversity in their pristine forms due to their perpetual conservation. Traditional festivals are often characterized by competitions (Fallasi, 1987) which can be tailored to promote traditional conservation knowledge of biodiversity. Instead of the usual beauty pageants that are the usual feature of most traditional festivals, these competitions could be enhanced to instil biodiversity conservation ethos in community members as well as the numerous visitors who attend the event. Also, the traditional festivals could be used as events for awarding personalities of biodiversity conservation who engage in bio-friendly activities in the society to serve as shining examples for others to emulate. In addition, traditional festivals are events in which policy makers and government officials highlight the policies of governments, while companies use it as platforms in showcasing their products and services (Odotei, 2002). Thus, conservation agencies should grasp traditional festivals as occasions to intensify biodiversity conservation education and engage in environmentally friendly activities. This great opportunity is not being well utilized by many countries to promote the conservation of biodiversity (O’Suvillan & Jackson, 2002).

Globally, festivals are recognized as viable platforms when the ideas of conservation of

biodiversity can be espoused. This explains why the United Nations have instituted various festivals for the environment (World Environment Day), the forests (International Day of Forests), wildlife (World Wildlife Day), biodiversity (International Day for Biological Diversity) and other important natural resources in our environment. Therefore, it is a step in the right direction, and a wise course to utilize traditional festivals innovatively to promote biodiversity conservation awareness and activities. This wonderful initiative has been embraced by many countries of the world. For instance, Cudny (2013) noted of the Slovaks that they celebrate the International Festival of Sustainable Development aimed at the sustainable development of the natural resources. Likewise, the Włodzimierz Puchalski International Festival of Nature Films commemorated in Poland annually as well as the International Environmental Film and Video Festival in Brazil are all geared purposely to environmental protection. Therefore, if traditional festivals are carefully planned, they can be used as great occasions to bolster conservation of biodiversity in the host and surrounding communities. The action plans 4-6 of the traditional biodiversity conservation strategy highlights the innovative ways of utilizing traditional festivals to boost conservation efforts for biodiversity in Ghana.

*Action Plan 4: Engaging in rigorous biodiversity-friendly activities to promote biodiversity conservation and awareness in host and surrounding communities during the commemoration of traditional festivals*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/ Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Engage in rigorous healthy and bio-friendly environmental activities to promote and enhance the conservation of biodiversity in the host and surrounding communities	Undertake massive tree planting exercises in degraded areas of Protected Areas and/or in the host communities as well as de-silt and clean all water bodies during traditional festivals	Restoration of degraded eco-systems through community efforts and community nurseries (Ghana NBSAP 2016)  Increasing forest and tree cover through afforestation and reforestation	Indigenous people have the right to manifest, practice, develop and teach their spiritual and religious, customs and ceremonies regarding sacred sites (UNDRIP 2006, Article 12)	Degraded areas of Protected Areas and in special areas of host communities are planted with trees and their water bodies cleansed (under the auspices of the Forestry Commission)	Traditional Authorities  Festival Organizing Committees  Non-Governmental Organizations for Conservation (Conservation International, Friends of Rivers and Water Bodies)  Environmental Protection Agency	Traditional festival host communities and their surrounding communities	Annually
					Water and Sanitation Agency, Ghana Tourism Authority		

<b>Strategy (What)</b>	<b>Target (How)</b>	<b>The complemented Scientific Conservation Strategies</b>	<b>Affiliated International Convention /National Legal instrument/ Lesson from Other Countries</b>	<b>Description of Indicator</b>	<b>Implementation Agencies/Actors (Who)</b>	<b>Jurisdiction for Implementation (Where)</b>	<b>Frequency (When)</b>
Engage in rigorous healthy and bio-friendly environmental activities to promote and enhance the conservation of biodiversity in the festival host communities and its surrounding communities	Involve local communities in identifying areas of priority in biodiversity conservation and management	Using Farm Boundary Planting, Agro forestry Systems and Enrichment Planting (Ghana WFP 2012) Effectively empower and solicit for the support of ...youth in the sustainably management of biodiversity (NBS 2002)	Involving local communities in the identification of priority areas of biodiversity (Tanzania NBSAP 2001)	Local communities are involved in the identification of priority areas for biodiversity conservation	Sponsors of the Traditional Festivals	Traditional festivals host communities and their surrounding communities	Periodically
	Assign conservation projects to youth or children groups in host communities during the festival eve and award them with prizes to imbibe in them conservation ethos for biodiversity		Promotion of the Children Waterfront rediscovery project to increase opportunities for children in local communities to improve their environmental education (Japan NBSAP 2012-2020)	Youth and children groups in local communities are assigned conservation projects during festival occasions and are awarded duly		Traditional festivals host communities and their surrounding communities	

*Action Plan 5: Effectively plan traditional festival program to include biodiversity education and awareness to facilitate better commitment of community members to biodiversity conservation*

<b>Strategy (What)</b>	<b>Target (How)</b>	<b>The complemented Scientific Conservation Strategies</b>	<b>Affiliated International Convention /National Legal instrument/ Lesson from Other Countries</b>	<b>Description of Indicator</b>	<b>Implementation Agencies/Actors (Who)</b>	<b>Jurisdiction for Implementation (Where)</b>	<b>Frequency (When)</b>
Tactfully plan the programs of traditional festivals to increase biodiversity conservation education, sensitization and awareness in host communities	Organize competitions during the festival event on biodiversity-related traditional knowledge systems to increase biodiversity conservation education	Collaborate with community-based organizations and NGOs in implementing programs that seeks to intensify national awareness campaign on the conservation of wildlife and forest resources in Ghana (Ghana FWP 2012)	Establish and promote appropriate education and awareness programs to facilitate proper community participation in the conservation of biodiversity (Tanzania NBSAP 2001)	Competitions on biodiversity-related traditional knowledge systems organized during festival observance in host communities	Forestry Commission Traditional Authorities Festival Organizing Committees Non-Governmental Organizations for Conservation (Conservation International, Friends of Rivers and Water Bodies)	Host communities of traditional festivals and their surrounding communities	Annually

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/ Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Tactfully plan the programs of traditional festivals to increase biodiversity conservation education, sensitization and awareness in host communities	Reward individuals, groups and companies that engage in activities that ensures biodiversity conservation in the Region during the commemoration of traditional festivals	Develop and implement a community-based incentive reward system for ecosystem services (NBSAP 2016)  Show recognition for activities undertaken by individuals, corporate bodies and communities in the sustainable use of biodiversity (NBS 2002)	Establish and promote appropriate education and awareness programs to facilitate proper community participation in the conservation of biodiversity (Tanzania NBSAP 2001	Individuals, groups and companies in the host communities are duly rewarded during the eve of the traditional festival observance	Department of Parks Environmental Protection Agency  Water Commission  Water and Sanitation Agency  Ghana Tourism Authority  Sponsors of the traditional festivals        Export Development and Agric Investment Fund	Host communities of traditional festivals and their surrounding communities	Annually

*Action Plan 6: Ensuring the provision of the needed logistics and funding to support all traditional festivals in Ghana, especially, those that are linked to Protected Areas with the aim of maintaining the resilience of their ecosystems*

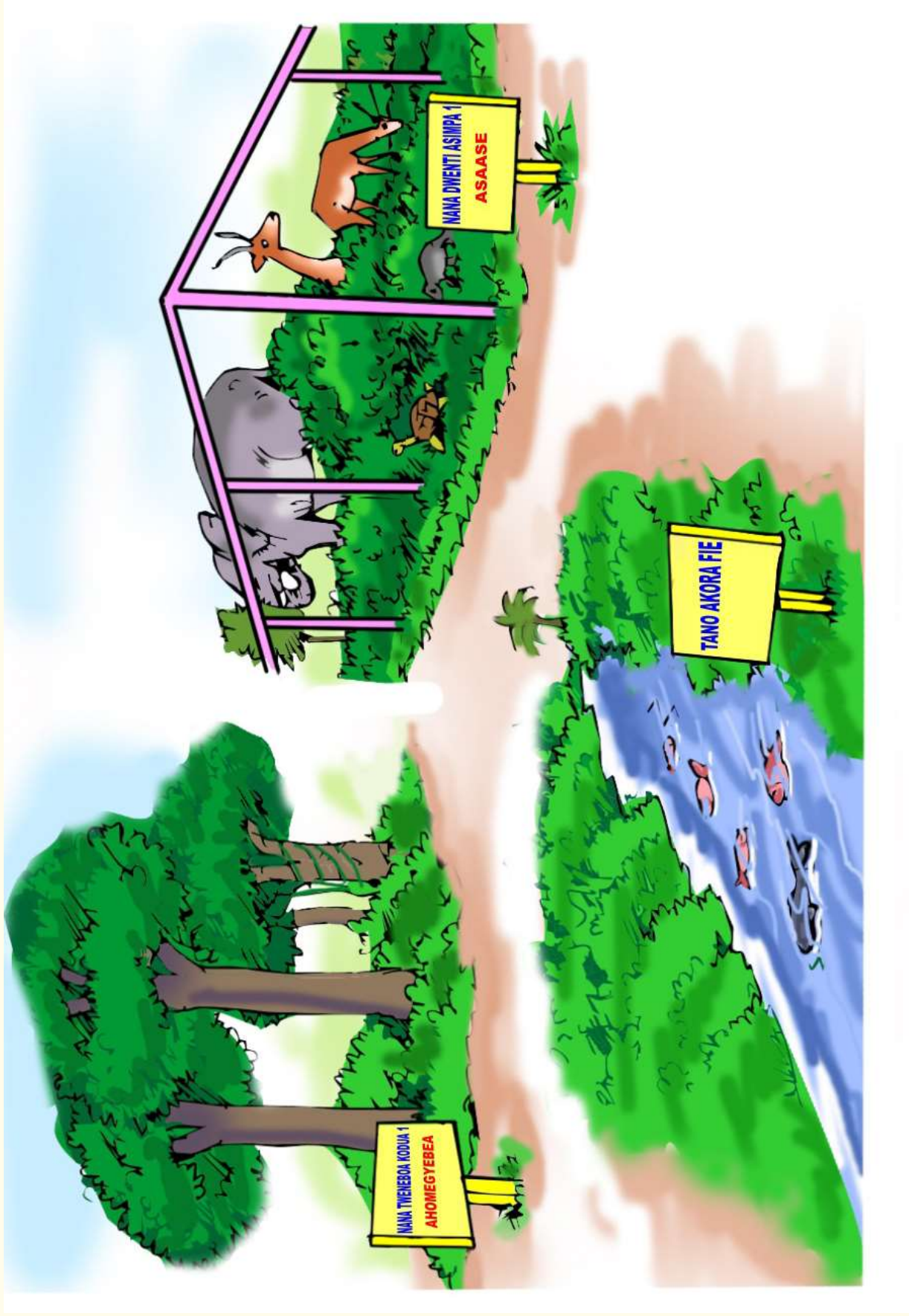
Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal /Lesson from Other Countries instrument	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Mobilization of funding and logistics to support traditional festival observations in Ghana to enhance the resilience of Protected Areas and their ecosystems	Provide the needed support and funding to festival organizers to assist them smoothly organize the event to keep in perpetual existence all Protected Areas that are directly linked to the festival	Develop systems and incentive packages to support public, private sector and community investment in reforestation and forest plantation development (Ghana FWP 2012)  Secure sustainable funding for the forestry and wildlife sector (Ghana FWP 2012)	Restoring, and safeguarding ecosystems that provide essential services, including ecological services (CBD Aichi Target 14)	Required funding and logistics to support traditional festivals observations in Ghana are generated	Forestry Commission  Traditional Authorities  Festival Organizing Committees  Non-Governmental Organizations for Conservation (Conservation International, Friends of Rivers and Water Bodies)  Department of Parks  Environmental Protection Agency  Water Commission  Water and Sanitation Agency  Ghana Tourism Authority  Sponsors of the traditional festivals  Export Development and Agric Investment Fund	Host communities of traditional festivals and their surrounding communities	Annually

## COMPONENT 3

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**Creatively building on the cosmological belief systems of  
the Ghanaian people in promoting conservation interests of  
biodiversity in Ghana**





## **Background**

As already noticed, Ghanaians believe that hosts of spirits surround them in the universe. Gumo, Gisege, Raballah and Ouma (2012) admit that many African spiritualists believe that humanity lives in a religious universe where everything in the cosmos such as trees, plants, animals and so forth are intimately associated with the Supreme Deity. Thus, they believe in the existence and outworking of many spiritual beings in the cosmos or universe. Also, as pointed out before, Ghanaians believe in the existence of the Supreme Deity, Ancestors, Deities/Spirits, Animism and Sorcery and Witchcraft. Interestingly, all these powers are believed to abhor and punish individuals who engage in environmentally unfriendly activities (Boamah 2015). Thus, these cosmological belief systems are a powerful source for nature conservation and protection (Chalk 2006). For instance, the Supreme Deity is believed by Ghanaians as withholding His blessings to individuals, families and societies who engage in negative environmental activities that wantonly destroy the biodiversity resources in their environment (Adom, Kquofi & Asante 2016). Likewise, the ancestors and spirits are thought to abhor individuals who mismanage and unsustainably use the biodiversity resources in nature (Taringa 2006). Many plant species, water bodies and particular spots are affiliated to and/or viewed as abodes of known ancestors and spirits in several Ghanaian societies (Kehinde 2013). Awuah-Nyamekye (2013) is optimistic that the cosmological belief systems still exert a great influence on Ghanaians and regulate their behaviour favourably towards the biodiversity resources in the environment. Iyoro and Ogungbo (2013) contend that the cosmological belief systems monitor the behaviours of those who believe in them to live in harmony with nature. Soini and Dessein (2016) argue that the cosmological belief systems have behavioural corrective elements that imbue a responsibility in individuals and instil in them conservation values to live in harmony with the biodiversity resources in nature. Indeed, Witoszek (2008) was not far from the truth when she theorized that the transformations in attitudes of people which conservationists want to realize cannot happen and survive without searching for solutions in the values and beliefs of local communities.

Cosmological belief systems held by Ghanaians assist them to cultivate biodiversity conservation ethos. In biodiversity conservation education and awareness campaigns, conservation bodies can appeal to the moral inclinations of Ghanaians through the cosmological beliefs that they hold. The reverential fear and respect that many Ghanaians have for the ancestors and spirits can be effectively utilized for the preservation of particular plant and animal species that are seen as endemic and/or threatened. These species could be affiliated to the highly revered spirits and/or ancestors in particular societies in Ghana. Hedlund-de Witt (2013) was right when he theorized that cosmological belief systems have the potential of complementing less sustainable policies for biodiversity conservation and environmental protection.

This indicates that cosmological belief systems hold a great potential in promoting biodiversity conservation in Ghana.

The action plans 7 and 8 showcase the proactive ways of using the cosmological belief systems of the Ghanaian people in heightening biodiversity conservation.

*Action Plan 7: Promoting of biodiversity conservation ethics in Ghanaian citizens through the innovative utilization of cosmological belief systems for biodiversity conservation education and awareness campaigns*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Promotion of the Ghanaian cosmological belief systems for biodiversity conservation through the development of ethically acceptable moral behaviours in Ghanaian citizens	Capitalize on the belief in God, ancestors, spirits, animism, sorcery and witchcraft in promoting ethically acceptable behaviours for biodiversity conservation	Recognize the rights of local people and their customs and belief systems that lead to the management of biodiversity in sacred sites (Ghana FWP 2012)	Preserve and strengthen religious, ritualistic, ethical and cultural methods of conservation (India NBSAP 2008)  Respect for the different systems of belief and indigenous knowledge should figure in the design of local solutions for sustainability [of biodiversity] (UNESCO 2002)	Ghanaian Cosmological belief systems have been used in promoting ethically acceptable behaviours for biodiversity conservation in citizens	Religious groups (Christianity, Islamic, African Traditional Religion)  Traditional Authorities  Forestry Commission  Wildlife Division	Ghanaian communities	Periodically

*Action Plan 8: Affiliating particular spots and biodiversity species in Ghanaian societies where species richness is threatened and/or is close to extinction to known deities, ancestors and personalities in the communities*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/ Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Protect threatened biodiversity species in particular spots through dedication or defying them to known spirits/deities/ancestors in Ghanaian communities	Dedicate particular forest tracts, flora or fauna species to known spirits/deities/ancestors revered by the people in the various parts of Ghana	Managing and enhancing the ecological stability of Ghana's forests and the conservation of biological diversity through biological inventories, biological and ecological indicators and creation of wildlife corridors (Ghana FWP 2012)  Maintaining the secrecy of the spiritual, and religious beliefs of sacred natural sites for biodiversity conservation (Ghana FWP 2012)	Indigenous people have the right to manifest, practice, develop and teach their spiritual and religious, customs and ceremonies regarding sacred sites (UNDRIP 2006, Article 12)	Threatened biodiversity species and spots are dedicated or defied after known ancestors/spirits/deities in the Ghanaian communities	Traditional Authorities  Forestry Commission  Wildlife Division  Environmental Protection Agency	Ghanaian communities with endemic and/or threatened biodiversity species and spots	Periodically

## COMPONENT 4

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**Creating public awareness, sensitizing and educating on the value of traditional biodiversity conservation, restoration and sustainable usage using the proverbs in Ghana**





## **Background**

**P**roverbs are powerful mediums for instructing people on issues such as biodiversity conservation. Gadzekpo (2013) realized the truism in this when she pointed out that many scholars are now realizing the great worth of traditional conservation epistemologies in proverbs that could inculcate the values of sustainable use of biodiversity in individuals. Proverbs offer sound moral lessons that embolden the exhibition of good traits such as living in harmony with nature (Anderson 2015) while frowning on morally degrading attitudes such as the unbridled use and destruction of biodiversity (Sanauddin 2015). Ghanaians have rich sources of proverbs that are usually in the preserve of the elderly members in the Ghanaian society. The folk sages in many Ghanaian local communities usually use every opportunity they get with the youth to instruct them on these wise and insightful maxims that exert positive impact on their behavioural development (Adom 2014; Rasul 2015). Therefore, there is the urgent need to look for ways of innovatively using the great oasis of traditional conservation ethos latent in Ghanaian proverbs to promote biodiversity conservation education, sensitization and awareness campaigns.

To aid in arresting the biodiversity menace in Ghanaian societies, the negative and unrestrained behavioural patterns of the Ghanaian citizens toward the use of biodiversity resources must be changed (Attuquayefio & Fobil 2005). Ghanaian proverbs have the capabilities of transforming these foul behaviours of Ghanaians that do not auger well for biodiversity conservation (Gadzekpo 2013). Interestingly, Ghanaian proverbs use metaphoric representations of biodiversity resources such as plants, animals and river bodies as the main characters in relaying the wise axioms. Ghanaian proverbs also demonstrate that a unique, harmonious interpersonal relationship exists between human beings and the biodiversity resources in nature and this must not be marred by the activities of the former. Due to the archetypical roles of Ghanaian proverbs in inciting people toward good behavioural attitudes, Awuah-Nyamekye (2013) is very convinced that it is a great potential asset that could be adapted in the modern quest for enhancing and promoting biodiversity education and sensitization in Ghana. Action plans 9-11 of the traditional biodiversity conservation strategy point out the avenues that can be used to promote and develop the conservation ethos espoused in proverbs for biodiversity conservation.

*Action Plan 9: Innovatively using community meeting days in promoting and developing the conservation ethics espoused in proverbs for biodiversity conservation*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/ Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Utilize taboo days and other public holidays in instructing society members on the sound conservation ethics in Ghanaian proverbs	Educate society members on the philosophical imports of Ghanaian proverbs that advocate the engagement in healthy environmental practices that promote biodiversity conservation	Promotion of public awareness and involvement of rural people in forest and wildlife conservation (Ghana 1994 FWP)	Establish and promote appropriate education and awareness programmes to facilitate proper community participation in the conservation of biodiversity (Tanzania NBSAP 2001)	Society members are well educated on the philosophical imports of Ghanaian proverbs for the development of biodiversity conservation ethics	Traditional Authorities Forestry Commission Wildlife Division Department of Parks Cultural Experts Elders in the society	Ghanaian communities	Periodically

*Action Plan 10: Incorporating the conservation ethos in Ghanaian proverbs into the biodiversity conservation education at the various levels of education in Ghana*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention /National Legal instrument/ Lesson from Other Countries	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)



Introduce the use of Ghanaian proverbs into biodiversity conservation education at all levels of education	Strategize and mainstream biodiversity conservation knowledge evident in Ghanaian proverbs into educational curriculum at all levels of education in Ghana Introduce new subjects or courses on traditional biodiversity conservation education using Ghanaian proverbs and/or integrate into existing environmental education courses and subjects in educational institutions in Ghana	Encouraging institutions of higher learning and corporate bodies to integrate indigenous knowledge and scientific knowledge into forest and wildlife management (Ghana WFP 2012)	Establish and promote appropriate education and awareness programmes to facilitate proper community participation in the conservation of biodiversity (Tanzania NBSAP 2001)	The study of biodiversity-related proverbs streamlined into educational curriculum at all education levels in Ghana New courses or subjects on traditional biodiversity conservation education using Ghanaian proverbs introduced and integrated into environmental education courses in Ghana	Ghana Education Service National Council for Curriculum and Assessment Department of Cultural studies in universities in Ghana (KNUST, UCC, UG etc.) Cultural Experts	All educational institutions at all levels of the academic ladder in Ghana: Elementary schools Junior High Schools Senior High Schools Tertiary institutions	Regularly
Introduce the use of Ghanaian proverbs into biodiversity conservation education at all levels of education	Promote collaboration between the National Commission on Culture, Colleges in charge of Cultural Education and the Ministry of Education to organize workshops and seminars on the traditional epistemologies in proverbs for biodiversity conservation education in all educational institutions in Ghana	Incorporate traditional knowledge into formal education with the Ministry of Culture and the University of Brasilia collaborating to promote the participation of instructors from traditional cultures on workshops in biodiversity conservation (Brazil NBSAP 2010)	Workshops and seminars on the traditional epistemologies in Ghanaian proverbs for biodiversity conservation education through an effective collaboration between institutions for cultural education and the Ministry of Education	National Commission on Culture Ministry of Education Institutions of Higher Learning on Cultural Education Cultural Experts Forestry Commission Wildlife Division	All educational institutions at all levels of the academic ladder in Ghana: Elementary schools Junior High Schools Senior High Schools Tertiary institutions	Regularly	

*Action Plan II: Innovatively utilizing the mass media in Ghana as agencies for the promotion of biodiversity conservation knowledge among the Ghanaian populace through debates, discussions and signage using biodiversity-related Ghanaian proverbs*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Intensify biodiversity conservation knowledge and education using biodiversity-related Ghanaian proverbs via mass media	Task the T. V. and Radio Stations to air programs on biodiversity conservation knowledge in the use of Ghanaian proverbs	Public awareness, understanding, appreciation and support for preservation and conservation of Ghana's biodiversity (Ghana NBSAP 2016)	Enhance public awareness and education on biodiversity conservation through audio, visual and print media India (NBSAP 2008)	Biodiversity conservation knowledge and education is intensified using biodiversity-related Ghanaian proverbs via mass media and advertising strategies	Radio and Television stations in Ghana Information Centres Multi-Media companies Traditional Authorities Cultural Experts Forestry Commission Wildlife Division Environmental Protection Agency	Ghanaian communities	Occasionally

**Lesson from Other Countries**

<b>Strategy (What)</b>	<b>Target (How)</b>	<b>The complemented Scientific Conservation Strategies</b>	<b>Affiliated International Convention / National Legal instrument/ Lesson from Other Countries</b>	<b>Description of Indicator</b>	<b>Implementation Agencies/Actors (Who)</b>	<b>Jurisdiction for Implementation (Where)</b>	<b>Frequency (When)</b>
Intensify biodiversity conservation knowledge and education using biodiversity-related Ghanaian proverbs via mass media and advertising strategies	Organize and air biodiversity conservation knowledge contests and programs using proverbs for the various educational institutions in Ghana at all level	Educate the public on traditional knowledge issues on biodiversity (NBSAP 2016)	The government will utilize internet websites to publicize biodiversity initiatives to deepen citizens' understanding of the natural environment	Contests and programs on biodiversity conservation knowledge using proverbs are organized in educational institutions in Ghana	Ministry of Education, NGOs (Conservation, Education etc.) Radio and Television stations in Ghana Information Centres Multi-Media companies Traditional Authorities Cultural Experts Forestry Commission Wildlife Division	Ghanaian educational institutions in Ghana at all levels  All Social Media Outlets in Ghana	Periodically  Regularly
Intensify biodiversity conservation knowledge and education using biodiversity-related Ghanaian proverbs via mass media and advertising strategies	Use social media platforms such as the internet websites of conservation agencies to showcase proverbs for biodiversity conservation education			The websites of conservation bodies and other media outlets to be used as platforms in disseminating biodiversity	Social Media Networks NGOs Environmental Protection Agency		

<b>Strategy (What)</b>	<b>Target (How)</b>	<b>The complemented Scientific Conservation Strategies</b>	<b>Affiliated International Convention / National Legal instrument/ Lesson from Other Countries</b>	<b>Description of Indicator</b>	<b>Implementation Agencies/Actors (Who)</b>	<b>Jurisdiction for Implementation (Where)</b>	<b>Frequency (When)</b>
	Embark on the designing and use of signage on the major streets and vantage points in the Ghanaian society for publicizing biodiversity-related proverbs for biodiversity conservation education and sensitization	Prepare and publish information on biodiversity conservation (NBSAP 2016)	Enhance public awareness and education on biodiversity conservation through audio, visual and print media India (NBSAP 2008)	Biodiversity conservation education, awareness and sensitization via Ghanaian proverbs to be carried out using signage placed at vantage points in the Ghanaian society	Communication Media companies in Ghana Municipal and Metropolitan Assemblies in Ghana Environmental Protection Agency Forestry Commission Wildlife Division NGOs (Conservation and Environmental Education) Department of Parks Art Signage enterprises Cultural Experts Graphic Designers	Vantage spots in all the Ghanaian communities	Periodically

## COMPONENT 5

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**Ensuring the active involvement and formalization of the owners of biodiversity and guardians of traditional knowledge systems in the formulation and implementation of policies, strategies and programmes on biodiversity conservation while ensuring fair and equitable distribution and rewards on the proceeds of biodiversity**





## **Background**

Local people are important stakeholders in the use and management of biodiversity (De Koninck 2005). As owners of the lands that house the rich biological diversities in the environment, they are supposed to be rightfully and actively involved in the planning, formulation and implementation of all strategies and policies in biodiversity management. Kehinde (2013) strongly posits that in ensuring successful biodiversity management in societies, local community members must be actively and fully involved in all the planning and decision-making processes. This is crucial because the local people have great and very useful dynamic insight, skills and experiential traditional knowledge in the conservation of biodiversity (Warren 1991). The United States Environmental Protection Agency (2002) has recognized that when local people are actively involved in all stages of the biodiversity management, it results in richer plans and greater success in the implementation of the biodiversity policy or programme. When the traditional authorities in local regions are empowered and given the privilege in managing biodiversity, there are heightened successes (Breuer 2002). In Ghana, the introduction of Community Forest Committees (CFC) and Community Resource Management Areas (CREMA) is a laudable strategy of enhancing local community participation in biodiversity issues. Unfortunately, the powers of such local associations are limited and not recognized in decision making processes at the higher level of biodiversity management (Asare 2000). The Ghana Forest Watch (2006) mentions that the selection of members to these local associations have been biased, rendering it less effective in representing the voices of local people in biodiversity management at the national level. Schultz (2002) opines that better decisions of management plans for biodiversity as well as its implementation pivot on the active involvement of local people as well as their traditional conservation knowledge in the use of biodiversity.

Also, the local people are more determined to positively assist in achieving the conservation of biodiversity and assisting in the implementation of biodiversity policies when they equitably enjoy some of the biodiversity proceeds (Amanor 2002). When the local communities are well catered for in the equitable sharing of biodiversity proceeds, it would prevent them from engaging and supporting bad environmental activities that destroy the biodiversity in the environment (Teye 2008) usually driven by their impoverished conditions (Marfo 2012). Therefore, to improve and yield better results in biodiversity conservation in Ghana, the owners of biodiversity and guardians of the traditional knowledge systems need to be actively involved in all the plans and programmes related to biodiversity management at all levels. There should be an enhanced strategy for ensuring the fair and equitable distribution of biodiversity proceeds to the local communities. This would encourage them in supporting biodiversity conservation initiatives and the implementation of biodiversity conservation strategies in their local regions.

This implies that when conservation strategies are being drawn, stakeholders from forest fringe communities must be invited to participate in the development of the strategies. Otherwise, the implementation of the policies cannot be fully successful, as already noted. The action plans 12-14 shows how local communities should be actively involved in the development of biodiversity conservation strategies.

*Action Plan 12: Actively involving the local people who are the owners of biodiversity in the planning, development and management of biodiversity in their jurisdiction*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Actively involve local people in the decision-making processes in biodiversity management	Use the media outlet to sensitize the general public on the rights of local people in biodiversity management	Enhance active participation of communities and land owners in resource management and addressing issues on tree tenure and benefit sharing (Ghana FWP 2012)	Guarantee through the media, the recognition of the rights of communities in biodiversity management (Angola NBSAP 2007-2012)	Local people are involved in all the decision-making processes in biodiversity management	Ministry of Local Government and Rural Development Forestry Commission Wildlife Division	All biodiversity management meetings in the country (Planning, Decision-making, Consultations etc.) Media Outlets	Regularly
Actively involve local people in the decision-making processes in biodiversity management	Adopt community participation approaches typical of local communities to boost the involvement of community members in biodiversity management schemes	Enhance active participation of communities and land owners in resource management (Ghana WFP 2012)	Adopt community participation approaches in the development and management of biological diversity (Tanzania NBSAP 2001)	Local community participation is boosted through an adaptation of community participation approaches	National Biodiversity Committee National House of Chiefs Traditional Authorities Non-Governmental Organizations in charge of the Rights of Local People	All biodiversity management meetings in the country (Planning, Decision-making, Consultations etc.)	



*Action Plan 13: Ensuring the fair and equitable distribution of biological diversity resources in favour of the owners in local communities*

<b>Strategy (What)</b>	<b>Target (How)</b>	<b>The complemented Scientific Conservation Strategies</b>	<b>Affiliated International Convention / National Legal instrument/</b>	<b>Description of Indicator</b>	<b>Implementation Agencies/Actors (Who)</b>	<b>Jurisdiction for Implementation (Where)</b>	<b>Frequency (When)</b>
<b>Lesson from Other Countries</b>							
Educate the traditional authorities in local communities on their benefits and the mode of equitable sharing of the biodiversity	Organize workshops to educate traditional authorities on the benefits and mode of equitable sharing of their biodiversity resources	Community-based incentive system for ecosystem services (Ghana NBSAP 2016)	Provide training to traditional authorities on their rights to the biodiversity resources (Angola NBSAP 2007-2012) Devise mechanisms for providing benefits from biodiversity to local communities (India NBSAP 2008)	The owners of biodiversity in local communities are abreast with the mode of equitable sharing of the benefits of the biodiversity	Ministry of Environment, Science, Technology and Innovation Forestry Commission Wildlife Division	Ghanaian local communities with Pas  Ghanaian local communities with PAs	Periodically
Employ local residents living in the forest fringe communities around Protected Areas in conservation projects		Increase rural employment through local management of off-reserve forests through mechanisms such as dedicated forests or Community Resource Management Areas (Ghana WFP 2012)	The government will work at recruiting human resources especially rural folks who will engage in conservation activities (Japan NBSAP 2020)	The employment of rural people living in the forest fringe communities is increased.	Department of Parks Ministry of Local Government and Rural Development		As and when the need arises

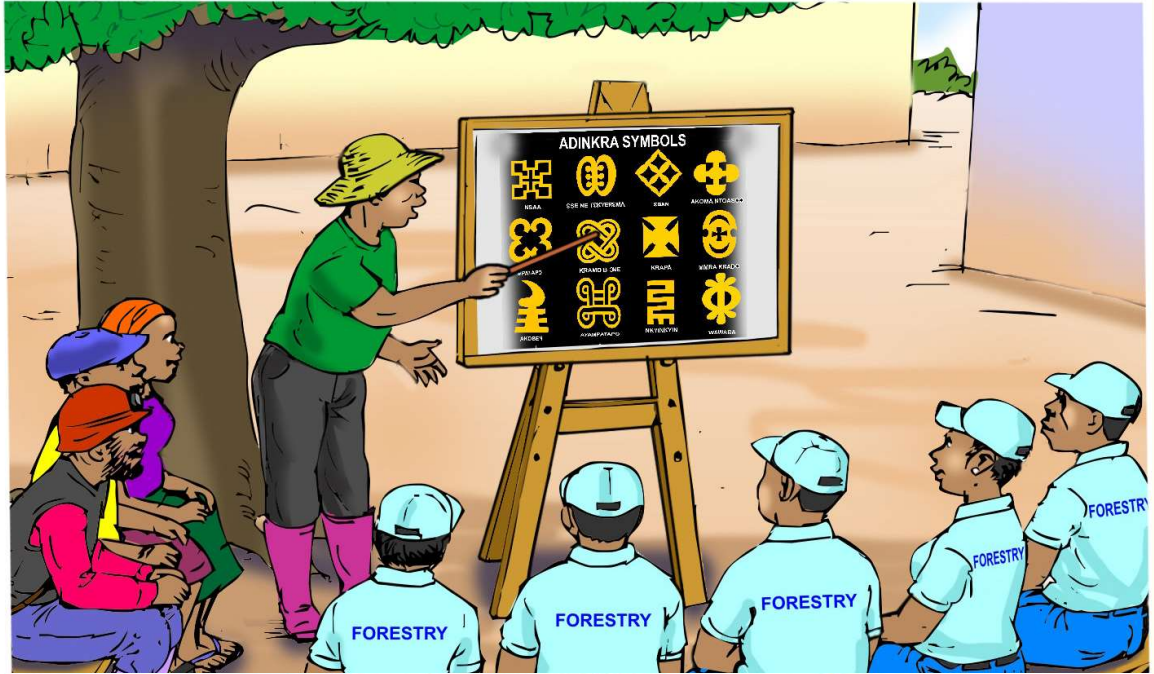
*Action Plan 14: Facilitating and empowering the capacity of local government (Traditional Authorities) in enforcing biodiversity legislation in their local communities*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Equip the traditional authorities in the local communities with the legal rights in enforcing biodiversity legislation in their local communities	Empower traditional authorities in the local communities with the legal right to inspect, prosecute and punish defaulters of unfriendly biodiversity activities in their jurisdiction	Community-government collaborative management approach (Ghana FWP 2012) Promote the traditional autonomy for the management of sacred and community dedicated forests (Ghana FWP 2012)	Lesson from Other Countries	Traditional authorities in local communities would be empowered to inspect, prosecute and punish defaulters of unfriendly biodiversity activities in their jurisdiction	Traditional Authorities Environmental Protection Agency Forestry Commission Wildlife Division Department of Parks Ministry of Local Government and Rural Development	Ghanaian local communities	Regularly

## COMPONENT 6

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**Providing the needed education to fill the knowledge deficiencies  
in the use of cultural and artistic elements in biodiversity  
conservation among conservationists in Ghana as well as  
intensifying the education of scientific conservation practices in  
local communities**



## **Background**

In the search for solutions to solve the biodiversity menace, many scholars are of the strong conviction that a synergy of scientific conservation practices and traditional knowledge systems may offer a more constructive approach to biodiversity management (Sinclair, Tuke & Opiang 2010; Johnson 1992; Wilder et al. 2016). Each of the two streams of knowledge has its distinct importance in biodiversity management and conservation. However, when each of the knowledge systems is used single-handedly, Golo and Yaro (2013) contend that it would not yield efficient outcomes in biodiversity conservation. Johnson (1992) concurs that when scientific conservation practices or traditional conservation practices operate in a truncated fashion, they are not likely to achieve maximum benefits. In truism, both traditional conservation practices and scientific conservation practices have their unique strengths and weaknesses. Thus, collaborating the good components of both conservation practices would result in more successful biodiversity management (Johnson 1992; Moller et al. 2004). Attuquayefio and Fobil (2005) note of the use of both conservation practices as widening the conservation repertoire, offering a broader solution to the multi-faceted challenges in biodiversity conservation, using the case of Ghana. Admittedly, there are slight differences in the scientific conservation approaches and the traditional conservation practices. As a result, some scholars are uncertain of the possibility of collaboration between the two streams of knowledge (Awuah-Nyamekye 2013; Sinclair et al. 2010). Yet, critical studies into the two conservation aspects of knowledge show that the collaborative approach in using scientific conservation models and traditional conservation practices is very feasible. Awuah-Nyamekye (2013) realized that many of the traditional knowledge systems have scientific underpinnings. The problem is how the holders of each of the knowledge systems would be helped to understand that each of the two systems of knowledge is somehow deficient. Thus, conservationists who are more knowledgeable and more inclined to the scientific conservation models must be helped to realize the great conservation ethos in the traditional conservation practices.

Likewise, local people who are owners of traditional conservation practices must also be assisted in knowing the great worth of the scientific conservation models in biodiversity conservation. This deep understanding would ensure that both conservation practices are respected. Moreover, addressing these knowledge gaps would foster unity and better understanding between conservationists and local people living in the forest fringe communities. A proper collaborative approach using the two knowledge systems would be successful only if there is mutual understanding (Iyoro & Ogungbo 2013). Conservationists must respect traditional conservation practices and view it as worthwhile and local people should not view scientific conservation practices as an overstepping of their long-held traditions (Wilder et al. 2016). Berkes (2012)



as well as Msuya and Kideghesho (2009) cautions against the deliberate devaluing of each of the two conservation knowledge systems but rather viewing both as equals and complementary to each other. Ajani et al. (2013) insist that the use of traditional conservation practices should not be seen as a substitution to the scientific models and vice versa. They are complementary to each other and not competitors in the modern quest for a proactive solution to arrest the biodiversity menace. India and China have set excellent examples in weaving the traditional ecological knowledge in their cultural and artistic elements with the scientific conservation models. This has been the secret to their marvelous successful feat in biodiversity conservation (China NBSAP 2011; India NBSAP 2008). Ghana requires a robust biodiversity conservation strategy that will innovatively utilize the strengths in the traditional conservation practices and the scientific conservation models. This can only materialize if the two forms of conservation practices are integrated by ensuring that the knowledge inconsistencies and voids of the conservationists in the traditional conservation practices and the local people represented by the traditional authorities in the scientific conservation practices are catered for adequately. The action plan 15 point out exactly what should be done to fill the knowledge gaps of both conservationists and traditional authorities. That is, effective ways that conservationists can be educated on the conservation ethos in cultural and artistic elements and how they can effectively use them alongside the scientific conservation approaches. On the other hand, action plan 16 shows how traditional authorities and their local communities can be educated to appreciate the relevance of the scientific conservation approaches to earn their support for their smooth implementation. The action plan 17 shows practically how the often-disjointed relationship between conservationists and traditional authorities in local territories can be improved and/or enhanced. This is crucial for the successful collaborative efforts between these two key stakeholders for the efficient management of Ghana's biodiversity.

*Action Plan 15: Studying traditional biodiversity conservation practices to equip conservationists to know how to implement them in the local communities*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Educate the conservationists on the traditional conservation practices and their great potentials in biodiversity conservation	Organise workshops, seminars and short course on the traditional knowledge systems and their relevance in biodiversity conservation	Incorporate the useful wealth of traditional conservation knowledge into modern technologies (NBS 2002) Educate the public on traditional knowledge issues on biodiversity (NBSAP 2016)	Provide training to forest rangers, forest guards etc. on the potentials of traditional knowledge systems (Tanzania NBSAP 2001)	Conservationists are to be well educated on traditional conservation practices and their great potentials in biodiversity conservation	Culturists in Universities and other institutions of Higher Learning on Cultural Studies Traditional Authorities Cultural Experts in local communities in Ghana Ministry of Education National Commission on Culture National House of Chiefs	Conservationists working in all the conservation agencies in Ghana	Periodically



*Action Plan 16: Studying scientific biodiversity conservation models to equip traditional authorities to know how to support their implementation processes in their communities*

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Educate the traditional authorities on the scientific conservation practices and their great potentials in biodiversity conservation	Organise workshops, seminars and short course on the scientific knowledge practices and their relevance in biodiversity conservation for traditional authorities	Empower traditional authorities in the management of biodiversity (NBS 2002)	Provide training to traditional authorities on scientific methods of biodiversity management (Tanzania NBSAP 2001)	Traditional Authorities would be educated on the scientific conservation practices and their great potentials in biodiversity conservation	Conservationists in Universities, RMSC, FORIG and other institutions of Higher Learning on Cultural Studies Ministry of Education Forestry Commission Wildlife Division Department of Parks	Traditional Authorities in local communities in Ghana	Periodically
<b>Lesson from Other Countries</b>							

### Action Plan 17: Strengthening the relationship between conservatoinists and traditional authorities in the Ghanaian communities

Strategy (What)	Target (How)	The complemented Scientific Conservation Strategies	Affiliated International Convention / National Legal instrument/	Description of Indicator	Implementation Agencies/Actors (Who)	Jurisdiction for Implementation (Where)	Frequency (When)
Beef up the relationship between conservatoinists and traditional authorities	Organise forums for conservatoinists and traditional authorities where there would be a deliberation on the application of both scientific and traditional knowledge in biodiversity	Integrate traditional and scientific knowledge to promote sustainable management of biodiversity (Ghana WFP 2012)	Sustainability of biodiversity through the application of modern and indigenous technologies (Kenya NBSAP 2000)	Forums are organized for traditional authorities and conservatoinists to deliberate on the application of both scientific and traditional knowledge in biodiversity conservation	Human Resource Experts Conservatoinists Traditional Authorities Ministry of Environment, Science, Technology and Innovation Forestry Commission	Conservatoinists working in forest fringe communities in Ghana	Periodically
	Hold seminars on how to improve the interpersonal relationships between conservatoinists and traditional authorities			Seminars are held to improve the relationship between conservatoinists and traditional authorities	Wildlife Division Department of Parks and Gardens		

**The Roles of the Implementation Agencies of the Traditional  
Biodiversity Conservation Strategy**

This section details the roles that would be played by the various actors and agencies in ensuring the smooth implementation of the traditional biodiversity conservation strategy in the Ghanaian communities.

- The Environmental Protection Agency (Ministry of Environment, Science, Technology and Innovation)

This ministry has been legally assigned to oversee all environmental issues in Ghana. Therefore, the overall implementation of the proposed traditional biodiversity conservation strategy would be ensured by this ministry, working through its allied agency, the Environmental Protection Agency. However, this would not be done in isolation, since biodiversity programmes and initiatives would be mainstreamed into the development plans of other sectoral ministries and agencies. The Environmental Protection Agency should set up a board comprising of representatives of all the institutions tasked with defined roles by the developed traditional biodiversity conservation strategy by the researcher. The board will perform oversight duties on the overarching duties of all the implementation agencies and actors suggested by the developed traditional biodiversity conservation strategy.

- The Forestry Commission, Wildlife Division, Fisheries Commission and the Department of Parks and Gardens

Biodiversity management in Ghana is directly in the grips of the three instrumental conservation bodies, that is, the Forestry Commission, the Wildlife Division and the Fisheries Commission. The Forestry Commission (FC) oversees all managerial issues regarding the flora species in the country. The FC will take charge of ensuring all flora related implementation processes in the traditional biodiversity conservation strategy such as supplying seedlings of threatened flora species while guiding local communities in Ghana in undertaking tree planting activities in degraded areas in their jurisdiction during festive celebrations. The Wildlife Division (WD) will educate the local communities on threatened fauna species that need to be conserved via their formulated taboos in their jurisdiction. Also, the WD will take charge of all forms of conservation education in forest fringe communities with the assistance of skilled culturists using proverbs. The aquatic biodiversity in Ghana is on the other hand, managed by the Fisheries Commission. The Commission must support all activities in local communities, especially communal labour sessions meant to protect and enhance the purity of the water in water bodies and rivers. They must liaise with the traditional authorities in setting local bylaws and taboos against bad fishing practices that negatively affect all aquatic biodiversity. The Department of Parks and Gardens manages the national parks and other Protected Areas in the country. This agency should work with traditional authorities in forest fringe communities around the parks in educating them against bad environmental practices using the suggested action plans in the developed traditional biodiversity conservation strategy.

- The Traditional Authorities

The traditional authorities in Ghanaian local communities are the owners of the biodiversity in their local Regions. They are also the arbiters in traditional knowledge systems since they are thought to be sitting in the seats of the ancestors. The traditional authorities used herein refer to the chiefs, their cabinet of elders, queen mothers as well as the traditional priests and priestesses. They govern the numerous local communities in Ghana and uphold the traditional knowledge systems. Thus, their role is the fulcrum to the successful implementation of the traditional biodiversity conservation strategy. They must promptly execute their duties in dispensing punishment to persons who flout taboos set to protect biodiversity. They must work with the conservationists in intensifying biodiversity education and awareness campaigns in their jurisdictions via the strategic action plans of the developed traditional biodiversity conservation strategy.

- The National House of Chiefs and the National Commission on Culture

This body regulates and monitors the various traditional ruling systems in Ghana. As such, they have a great stake in the governance of chiefs and their cabinets of elders in the local communities. This National House of Chiefs advise the chiefs and their cabinets of elders on salient issues and has the power to call them to order and/or reprimand them when they do not play their duties well. Thus, they would monitor and ensure that the chiefs are meticulously following the dictates outlined in the traditional biodiversity conservation strategy in their jurisdictions. They must send their representatives at regular intervals to local communities to inspect the management of biodiversity. The National House of Chiefs must instruct the various chiefs in submitting regular reports on how they are discharging their implementation duties for perusal and advice. The National Commission on Culture which is a body interested in the recognition, preservation and promotion of cultural heritage and traditional knowledge systems would be assigned to monitor activities that promote the awareness creation of the relevance of the cultural and artistic elements, particularly, cultural practices and activities that promote biodiversity education as suggested in the developed traditional biodiversity conservation strategy of the researcher.

- Non-Governmental Agencies in Charge of Biodiversity Management and Conservation in Ghana

These agencies include the Conservation International, Friends of Water and River Bodies and others whose setups are aimed at protecting the biodiversity resources especially in local Regions of Ghana. They are to ensure that the strategic action plans of the traditional biodiversity conservation strategy receive much recognition in the Ghanaian communities. These NGOs in charge of environmental activities must integrate the clear-cut action plans of the researcher's developed traditional biodiversity conservation strategy into their biodiversity conservation and environmental awareness campaigns.

- Ghanaian Universities and Institutions of Teaching, Learning and Research in Cultural

## Studies

The cultural experts and/or lecturers in various institutions of teaching, learning and research in cultural studies would carry out the instruction on cultural and artistic elements pertinent to biodiversity conservation to sensitize conservationists who are not very knowledgeable in traditional knowledge systems on the great conservation wisdom in them. On the other hand, the scientific conservation experts/lecturers in institutions of teaching, learning and research would be tasked to instruct the traditional authorities on the scientific conservation models for biodiversity conservation in these modern times. These forms of education will be carried out through workshops, seminars and short courses organized for the conservationists in their workplaces as well as in local communities for the traditional authorities.

- Ministry of Local Government and Rural Development

This ministry would be tasked to ensure that local people living in forest fringe communities are employed to assist the conservationists in the protection of the biodiversity resources in their areas. This would deepen their resolve in assisting with biodiversity conservation programmes and activities and restrain them from negative environmental activities that put the country's biodiversity in great danger. 3.8 Judiciary Service of Ghana, Legal Aid Ghana, Police Service, Law Courts, Forest Guards, Parliament Select Committee on Lands and Forestry and Local Government Service These bodies would ensure that the by-laws, taboos and other local laws that promote biodiversity conservation are strengthened and more strictly observed in all the Ghanaian communities. They would work closely with the traditional authorities to ensure stringent observance and adherence to the taboos and cosmological beliefs associated with the use of resources. Also, they would ensure that the right penalties and sanctions are applied to serve as deterrents to other would-be offenders.

- Judiciary Service of Ghana, Legal Aid Ghana, Police Service, Law Courts, Forest Guards, Parliament Select Committee on Lands and Forestry and Local Government Service

These bodies would ensure that the by-laws, taboos and other local laws that promote biodiversity conservation are strengthened and more strictly observed in all the Ghanaian communities. They would work closely with the traditional authorities to ensure stringent observance and adherence to the taboos and cosmological beliefs associated with the use of resources. Also, they would ensure that the right penalties and sanctions are applied to serve as deterrents to other would-be-offenders.

- Ghana Tourism Authority, Sponsors of Festive Celebrations, Festival Organizing Committees and Export Development and Agric Investment Fund

As a body interested in the development of tourism in Ghana, the Ghana Tourism Authority would be involved in the planning and management of traditional festivals that would attract tourists into host communities that have highly conserved their biodiversity. Moreover, the body

would be tasked with the responsibility of planning developmental schemes to increase the eco-tourism potentials of Protected Areas such as sacred groves and parks that are not populous in the country. This would ensure the protection of these hotspots of biodiversity while generating employment avenues for the impoverished local people living in the fringes of such sites.

Also, the body is to liaise with festive organizing committees and sponsors of festivals to plan and draw effective programmes for festive commemorations that would help to enhance and conserve the biodiversity in the host and their surrounding communities. They would be tasked to find ways of funding the awards that would be given to renowned persons, groups and agencies that have set excellent examples in promoting the conservation of biodiversity in the celebrant communities.

- Religious Groups and their Leaders

The religious groups and their leaders would be assigned to promote biodiversity conservation education and activities. They would do this through their religious teachings and programs, using it in inculcating conservation ethos in their followers. They are to support the biodiversity conservation activities in the country through their religious campaigns, capitalizing on the cosmological beliefs held by their followers to promote the conservation of biodiversity.

- Ministry of Education (Ghana Education Service) and National Council for Curriculum and Development

These bodies would ensure the full incorporation of traditional knowledge into the curriculum for learners at all levels of education in Ghana. They would also be tasked to oversee educational contests such as quizzes on biodiversity conservation in educational institutions in Ghana.

- Multi-Media Networks and Communication Media Companies such as Radio Stations, T.V. Stations, Signage Companies and Information Centres

These media outlets would promote the biodiversity conservation education and awareness campaigns among the general public through the innovative strategies of using the print, video, audio and visual media suggested in the traditional biodiversity conservation strategy.



## Research Report on the Traditional Biodiversity Conservation Strategy Using Indigenous Knowledge Systems

The developed traditional biodiversity conservation strategy drawn by the researcher was circulated widely among the stakeholders in biodiversity management in Ghana. Precisely, feedback on the developed traditional biodiversity conservation strategy was solicited from a total of seventy-two (72) respondents representing 64.2% of the total sample for the study, consisting of ten (10) conservationists (66.6% of the conservationists involved in the study), three (3) culturists (60% of the culturists involved in the study), fifteen (15) traditional authorities including four (4) chiefs, eleven (11) elders in the traditional court in the study areas (53.57% of the traditional authorities involved in the study) and thirty-five (35) elderly residents in the study areas (58.3% of the elderly respondents engaged in the study). Many of the stakeholders in biodiversity use and management in Ghana conservationists, culturists and some of the learned traditional authorities offered their views in a written form on the assessment guide. On the other hand, the other respondents offered their views when the researcher interviewed them personally and in Focus Group Discussions. The researcher's discussions of the findings under this objective have been presented in accordance with the keys for assessing the efficacy of policies suggested by Morestin (2012). The keys for the assessment include clear problem identification, evidence or reality based, clear identification of vision, aim and objectives, relevance to biodiversity conservation in Ghana, feasibility, efficient implementation, weaknesses free and strengths. Figure 18 shows graphically the views of the respondents in percentages with respect to each of the aspects of the criteria used for the assessment.

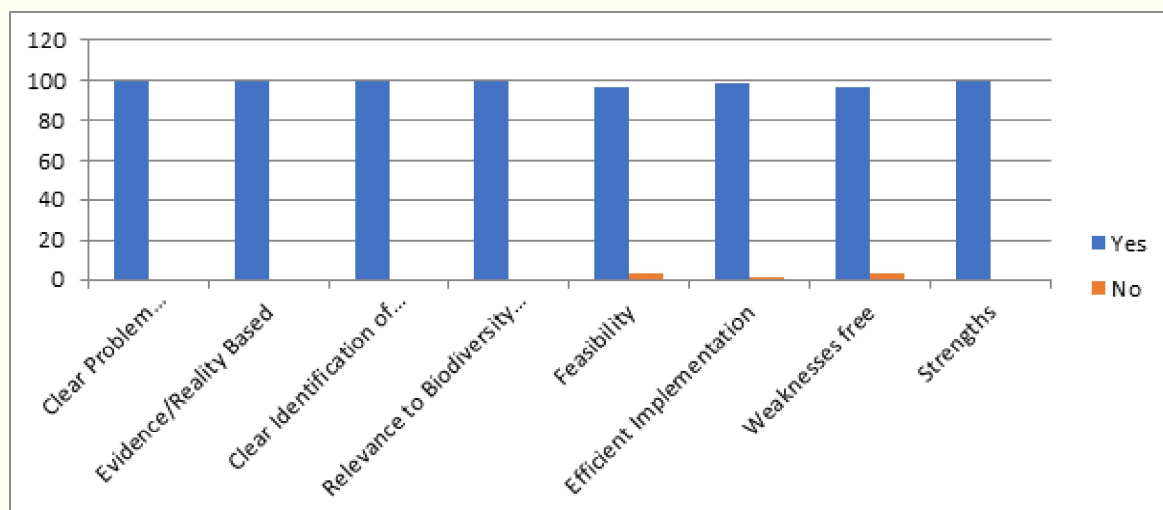


Figure 1: Assessment of the developed Traditional Biodiversity Strategy

Source: Field Work, 2017 (Researcher's Construct)

## **Clear identification of the problem that necessitated the formulation of the Traditional Biodiversity Strategy**

All the 72 respondents admitted that the developed and proposed traditional biodiversity strategy clearly identifies a feasible and disturbing problem in biodiversity management in Ghana. The conservationists contended that the integration of traditional knowledge systems in the Ghanaian cultural elements with the scientific conservation approaches has always been a great challenge. This concurs with the view of Boamah (2015) who contended that the reconciliation of indigenous knowledge in cultural and artistic elements and modern science has been a major challenge in biodiversity conservation in Ghana.

One of the heads of the conservation units wrote the following in his assessment report on the traditional biodiversity strategy developed by the researcher:

The conservation bodies lack comprehensive information on the traditional knowledge systems in the cultural traditions of the Ghanaian people. Many of our colleagues think the scientific models are disjointed in thoughts with the cultural instruments used in biodiversity conservation. With the developed traditional biodiversity strategy addressing these concerns, the approach to biodiversity conservation will be holistic (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 12 December 2017).

The conservationists, in their written reports, unanimously admitted that the traditional biodiversity strategy drawn and presented in this thesis by the researcher would help arrest the challenges they face in the field, while fostering their good relationship with the local people living in the forest fringe communities. The conservationists claim that the traditional conservation strategy has heightened their knowledge about the traditional conservation approaches, in which Ghanaians, including Asantes, attempt to protect and conserve biodiversity in Ghana.

In addition, the conservationists mentioned that the way of utilizing these cultural instruments in biodiversity management in the modern age to meet contemporary scientific developments has been cleverly addressed in the current traditional biodiversity strategy drawn by the author of this thesis. The sidelining of the traditional conservation ethos in the cultural and artistic elements of local communities over the years has always been attributed to the fact that the traditional conservation methods are despised and disdained by those who draw and implement biodiversity strategies. Battiste (2002) noticed among conservationists that they often marginalize the traditional conservation wisdom in the cultural and artistic elements of communities in the development of biodiversity strategies and policies because they view them as frozen in the past with no proper application in these modern times. Also, conservationists and some scholars opine that traditional knowledge systems in the cultures of people do not have any correlation, whatsoever, with the scientific conservation models used in modern societies (Materer et al. 2002, Battiste 2002). The current strategy drawn by the present writer has evidently disproved the erroneous notion shared by the conservationists.

The traditional biodiversity strategy allows local people to have a bite in biodiversity conservation issues, making them feel important and appreciated. Many of the residents in the study areas said that the directions in the traditional biodiversity strategy would motivate them in supporting biodiversity conservation initiatives drawn by the author of this thesis, would motivate them to support the biodiversity conservation initiatives proposed in his new document. One of them said this in a Focus Group Discussion on the developed traditional strategy:

The document suggests really interesting ways that our festivals and proverbs can be used in bolstering biodiversity conservation education. All members of the society, elders, the youth and even children will be willing to support such initiatives. The traditional authorities will now be more willing to lead us in undertaking biodiversity conservation projects in our community. Now, the spotlight is on us and our culture which is a good step in achieving enhanced biodiversity conservation efforts (EC2-FGD, Oral Report on the developed Traditional Biodiversity Strategy, 15 December 2017).

This finding concurs with the view of Abdullahi et al. (2013) that whenever the conservation ethos in the cultural and artistic elements of local people are respected, appreciated and utilized by conservationists, it leads to more successes in the implementation processes of the national biodiversity strategy as local people who feel part of the biodiversity management offer their wholehearted support.

Although, the author of this thesis believes that the traditional biodiversity strategy will be popular among the citizens of Protected Areas, it is an exaggeration to say, as the informant pointed out, that all members of the society would be willing to support it. The researcher is skeptical about this assertion because, he is aware that the religious stance of some Christians and Moslems may influence them to reject the taboos that are associated with the people's divinities and ancestors.

### **Justifications that the developed Traditional Biodiversity Conservation Strategy is based on Evidence/Reality**

The 72 respondents in consensus said in their written and recorded reports that the developed traditional biodiversity strategy is based on the realities on the field and arrests the real challenges in biodiversity conservation in Ghana. For instance, the conservationists admitted knowledge of the dearth in traditional conservation knowledge as highlighted in the recently released National Biodiversity and Action Plan 2016. Some of the strands in the written reports supporting this argument included:

...the non-availability of a directive material for biodiversity management using the cultural practices of local communities is not news! Conservationists are more inclined to the scientific conservation strategies because that was the focus in the instruction we received in the universities (EER-PI, Written Report on the developed Traditional

Biodiversity Strategy, 17 December 2017)

...though we thought of ways of drawing the local people into biodiversity management before, yet, it was really difficult. This is the right direction we need to put the local people on deck in biodiversity conservation projects and programs (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 13 December 2017)

Other conservationists admitted that the traditional conservation approaches emphasized in the developed biodiversity strategy were and are still the efficient methods that have maintained many of the cultural and sacred groves with rich sources of biodiversity in their pristine form. Their views concur with the assertions of Iyoro and Ogungbo (2013) as well as Berkes (2012) that the traditional conservation ethos in the cultural and artistic elements have adaptive integrity that is valid for all time use in biodiversity management. G'Nece (2012) vouched the potency of cultural and artistic elements in biodiversity management because it is quicker in its application, cheaper and reliable. Therefore, the directives suggested in the developed document are a refinement of those traditional approaches based on the cultures of the ethnic societies in Ghana to make them very appropriate to contemporary settings. One respondent who is advocating the integration of cultural and artistic elements who doubles as a traditional leader and a conservationist highlighted that the developed traditional biodiversity strategy was solidly based on reality, even alluding to some similar application in other global communities. He stated in his report:

The wonderful suggestions made in the developed traditional biodiversity strategy are not empty, and artificially made up. Successful countries with rich taxas of biological diversities like China, Brazil and India especially, have not abandoned their traditional conservation approaches even in the climax of scientific and technological development in their countries. If Ghana follows their shining example by integrating the clear-cut, innovative and feasible suggestions in the developed traditional biodiversity strategy, of course, as a complement to the scientific conservation models, we will achieve a real great feat in biodiversity conservation and general biodiversity management (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 11 December 2017).

The traditional authorities and the elderly respondents all indicated that some of the interesting suggestions made in the developed traditional biodiversity strategy were similarly implemented in their youthful times. Many of the elderly respondents in a focus group discussion of the document shared some interesting moments they had and how they wholeheartedly supported the biodiversity projects during societal gatherings like festive celebrations, communal labour and so forth. They said:

The festive eve was a period of environmental activities. We made sure that our surroundings were clean. We knew our ancestors were coming to stay for the period so we always maintained cleanliness. Best households were rewarded by the traditional

council with bunches of plantain, etc. Our taboos were observed so we drank healthy water and ate good food free of chemicals. A renaissance of these traditionally helpful cultural practices in a modern package will go a long way in boosting conservation efforts in the management of the biodiversity in Ghana (EC2-FGD, Oral Report on the developed Traditional Biodiversity Strategy, 10 December 2017).

Of course, Boersema and Reijnder (2009) were not far from the truth when they opined that when solving challenges in biodiversity conservation, you are entirely dealing with social issues that must earn the favour and support of all stakeholders, including the local people in local communities. This can be done only if their cultural and artistic elements are incorporated in conservation initiatives and programmes for biodiversity.

### **Clear identification of vision, aim and sound objectives of the developed Traditional Biodiversity Strategy**

The vision, aim and objectives of the developed traditional biodiversity strategy to all the 72 respondents are very clear and empirically sound. Many of the conservationists opined that the vision of the developed traditional biodiversity strategy shows in summary its main function which is to complement the scientific conservation models so as to maximize its performance in biodiversity management in Ghana. Likewise, the traditional authorities and elderly respondents contended that the aim of the traditional biodiversity strategy highlighted exactly the source of the innovative suggestions which is from the cultural and artistic elements of Ghana. Two conservationists indicated that this was in the right direction since the aim of the document reflected the dictate of the article 18 of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets. They disclosed this in their separate written reports:

Ghana is a signatory to the CBD and as such is mandated to implement the directives in the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets which calls [sic] for a utilization of the traditional ecological knowledge related to biodiversity conservation in biodiversity management. This document [referring to the developed traditional biodiversity strategy] would help Ghana to honor this convention fully as the previous and current national biodiversity strategies have not answered it comprehensively (EEEF-FGD, Written Report on the developed Traditional Biodiversity Strategy, 3 December 2017).

The international conventions on biodiversity conservation like the UN Declaration on the Rights of Indigenous People (2006) calls [sic] for the respect, recognition, appreciation and promotion of the traditions, customs and cultural practices of local communities while using them in biodiversity management. This developed traditional biodiversity strategy I am convinced is aimed at this same aim which is very commendable (RMMM-FGD, Written Report on the developed Traditional Biodiversity Strategy, 10 December 2017).

The objectives of the developed traditional biodiversity strategy illustrate the main tenets of the suggestions from the respondents, the observations from the field and the document analysis. The six main objectives of the traditional biodiversity strategy after their formulation were shown to some of the conservationists and traditional authorities before their utilization for the development of the document. As such, the respondents affirmatively confirmed their soundness in formulation. The head of one of the conservation bodies told the researcher:

We have already discussed these objectives. I don't have any problems with them. They are sound and innovative. They highlight the findings from your research which are solidly based on the identified cultural and artistic elements namely cosmological belief systems, taboo systems, proverbs, and festivals and how they can be used today in promoting conservation interests in especially the local regions of the country. Also, the need to actively involve the local people in biodiversity management as well as bridging the gap between the scientific and traditional conservation knowledge systems through education are key for the smooth management of the biodiversity in the country (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 16 December 2017).

The traditional authorities were very happy and content with the aim and objectives of the traditional biodiversity strategy because it calls for a respect of the cultural traditions of communities as proposed by many international conventions that Ghana has signed and ratified as exemplified by Adom et al. (2017). The traditional authorities also passed favourable comments and were just in high expectation of the acceptance and promulgation of the traditional biodiversity strategy since it addressed their major concerns.

### **Reasons why the main components of the developed Traditional Biodiversity Strategy are relevant to biodiversity conservation in Ghana**

The main components of the strategy touch on the four cultural and artistic elements that are pertinent to biodiversity conservation. These are proverbs, cosmological belief systems, taboo systems and festivals. All the 72 respondents were convinced of the innovative ways of harmonizing the cultural and artistic elements with the scientific conservation approaches. Others also admitted that the traditional conservation approaches have performed better in biodiversity conservation in Ghana. The conservationists confidently stated that the six main components suggested in the traditional conservation strategy, drawn by the present researcher, are relevant to the management of biodiversity in Ghana. In line with their expressed confidence, they said the following to the researcher:

The cultural and artistic elements exemplified in the document have been the main drivers that have protected the remaining tracts of lands with hotspot biological diversities in the various parts of the country. Taboos and cosmological belief systems have aided in the prevention of resource abuse in many parts of the country, not only in the Ashanti



Region of Ghana (EEEE-FGD, Oral Report on the developed Traditional Biodiversity Strategy, 17 December 2017).

Indeed, the relevance of cultural and artistic elements of people to the management of biodiversity has widely been acknowledged in literature. For instance, Osei (2006) highlighted the great wealth of conservation ethos in taboos for restraining the unbridled attitudes toward the use of biodiversity. Tiwari et al. (1998) acknowledge that taboos and cosmological belief systems are the prime factors for guiding the conduct of people and defining their behaviour towards all forms of exploitation of biodiversity.

One of the learned traditional leaders who was much concerned about the good impact which the researcher's developed traditional biodiversity strategy would have on people's attitude towards conservation of biodiversity in Ghana, wrote the following in his report during his comments about the document:

The developed traditional biodiversity strategy identifies significant problems and prescribes ways and means of solving them. The application of the dictates of the strategy will also help shape the psychological and behavioural patterns of Ghanaians in terms of the use of biodiversity (TTL-PI, Written Report on the developed Traditional Biodiversity Strategy, 18 December 2017).

Certain conservationists who were skeptical of the use of cultural and artistic elements in biodiversity management were appeased of the holistic approach adopted by the researcher in the development of the traditional biodiversity strategy. In their written reports they admitted that the cosmological belief systems target efficient ways that all the three major religions in Ghana can be drawn into biodiversity conservation programmes and initiatives. This interestingly agrees with the view of Golo and Yaro (2013) who said that the religious teachings of the three major religions in Ghana must be channelled in teaching their followers the need to conserve biodiversity by citing scriptural examples from the Bible and the Quran. This suggestion holds great worth as Taringa (2006) mentions how Christians in the Shona ethnic society of Zimbabwe, provided with modern agricultural education and extension services by some mission churches via their religious teachings, became more successful farmers.

The respondents also applauded the concept of campaigning against the uncensored use of biodiversity using the shining examples of known personalities and ancestors in the various Ghanaian societies. This reflects the ideals of Museka and Madondo (2012) who suggested that African cosmology, especially, reverence for the ancestors who jealously protected the biodiversity in their environment must be stressed in all environmental pedagogy in communities.

### **Feasibility of the strategies in the developed traditional biodiversity strategy**

Seventy (70) out of the 72 respondents affirmed the feasibility of the strategic plans developed by the researcher. Many of them indicated that the holistic approach suggested in the document



addresses the diverse needs of the various factions of members in the Ghanaian society. Others also mentioned that the strategic plans are feasible because they were developed from the views of the local people living in the forest fringe communities. The key roles that local people and their experiential cultural traditions play in resource management are crucial for the success of all environmental programmes and initiatives as Adom (2017) noted.

Also, the researcher's traditional biodiversity strategy has been appreciated by some respondents who claim that its implementation is feasible because it assigns specific problems to particular bodies to deal with. The feasible implementation of the traditional biodiversity strategy has thus been commended by one conservationist in his written report:

The developed traditional biodiversity strategy is feasible because it tasks specific people and agencies in ensuring the compliance of all the strategic action plans. Also, they emanate from the local people and it addresses, especially, local problems in biodiversity management. The action plans are really achievable (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 16 December 2017).

The elderly respondents also indicated that the action plans are feasible. They said that the setting of new taboos, the innovative use of festivals and others will be easily embraced by the members in the various Ghanaian communities because of the social cohesion and communal solidarity. The traditional authorities were convinced of the feasibility of the action plans in the document because of the already stringent sanctions in the various Ghanaian communities for persons who flout the taboos, disrespect the ancestors and fail to attend festivals and/or help in all the activities drawn by the traditional council.

The researcher noticed from the written reports of the heads of the conservation agencies that they were particularly convinced of the feasibility of the document. They said that the improvement of the relationship between the local communities and the conservation agencies is the stepping stone in ensuring the entire feasibility of the action plans which have already been addressed by the document. One of them wrote:

The training via workshops and seminars that would be offered to heighten the understanding of both the traditional and scientific knowledge systems for biodiversity management for both the conservationists and local communities would foster and enhance the cordial relationship between them. This would make ease the attainability of the promising action plans of the developed strategy (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 12 December 2017).

Two respondents were not convinced of the feasibility of the assigning of endemic flora and fauna species as abodes of some divinities suggested by the document. They admitted that this would call for assigning reverence and doing an act of obeisance to such species which would be considered idolatrous by many Ghanaians who are Christians and Muslims. A similar assertion

was made by Boamah (2015) that the worship or reverence to deities is seen by the larger Christian and Islam followers as idolatrous and unhealthy. As a result, the respondents suggested the abrogation of this action plan which the researcher agreed after further deliberations with the skilled culturists and heads of the conservation bodies. All the respondents arrived at a consensus that affiliation of the identified endemic species to deities feared in communities as well as ancestors respected in communities would rather be accepted by the larger Ghanaian populace.

### **Efficiency of the suggested implementation agencies or actors in ensuring the full implementation of the Traditional Biodiversity Conservation Strategy in Ghana**

Seventy-one (71) out of the 72 respondents were very satisfied with the implementation agencies and actors that have been suggested to ensure the full implementation of the action plans of the traditional biodiversity strategy. Many of the respondents called for a collaboration between the various implementation actors and agencies in order to achieve the maximum degree, all the action plans of the traditional biodiversity strategy. The head of one of the conservation agencies stated in her report:

The Forestry Commission, the Fisheries Commission, the Wildlife Service Division and the Department of Parks and Gardens are the responsible agencies to manage the natural resources (flora and fauna), water resources and protected areas in trust of the traditional owners who are now part of the implementation actors as per the document. With the involvement of all these agencies, each performing their true functions in collaboration with other agencies, efficiency will be the outcome. This could be efficient if the agencies would adopt the coordinated approach towards achieving the action plans of the traditional biodiversity strategy (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 19 December 2017).

Other conservationists were very certain that the implementation processes of the traditional biodiversity strategy would be very successful due to the creation of board for the coordination of the activities of all the agencies as well as the assistance that would be earned from the local people living in the various Ghanaian communities. One of the conservationists highlighted this in his report:

The formation of a board to oversee the duties of the suggested implementation agencies will enhance the implementation of the researcher's developed traditional biodiversity strategy. Also, with the collaboration of the local communities in identifying priority areas for biodiversity conservation and having technical advice from the Forestry Commission, Parks and Gardens and the Environmental Protection Agency as well as the unflinching support of the traditional authorities, the action plans of the traditional biodiversity strategy would be achieved (RMMM-PI, Written Report on the developed Traditional Biodiversity Strategy, 14 December 2017).

The traditional authorities and the elderly respondents were eager to support the plan in order to see the full implementation processes of the traditional biodiversity strategy. They admitted that the traditional biodiversity strategy is the answer to their earnest call, especially for them to play active roles in biodiversity conservation initiatives and programmes. One traditional leader disclosed in his written report:

We are willing to offer our wholehearted support to the conservation agencies so far as our chief concerns are addressed, with the main concern being the respect and promotion of our cultural and artistic elements. We wish to state our position as caretakers of the natural resources our ancestors offered in our care. We would definitely work with the responsible agencies to bring to fruition, all the action plans in the traditional biodiversity strategy (TTL-PI, Written Report on the developed Traditional Biodiversity Strategy, 9 December 2017).

One of the elderly respondents was doubtful of the success of the implementation agencies, especially the conservation agencies tagged with responsibilities in the traditional biodiversity strategy. He complained that the conservation bodies are not up to task with the general responsibility they have with conserving the nation's biodiversity. He reiterated in his report:

I am skeptical about the success with the implementation of the traditional biodiversity strategy which is partly in the hands of the conservation agencies. They have already been tasked to ensure biodiversity conservation in the country. Yet, the environment continues to be degraded. Also, the Judiciary is perceived as corrupt and slow. If strong monitoring mechanisms are not put in place, these implementation actors and agencies may not perform creditably (AN-PI, Written Report on the developed Traditional Biodiversity Strategy, 19 December 2017).

The concern he expressed in his written report shows that some monitoring mechanisms must be put in place with clear timelines set for each of the action plans for the implementation actors and agencies to be up to task. This would arrest the fear of them not performing. The researcher accepted this suggestion and therefore incorporated the monitoring mechanism in the plan.

### **Weaknesses associated with the developed Traditional Biodiversity Strategy and their suggested corrections**

Sixty-five (65) respondents out of the 72 respondents did not identify any weakness with the developed traditional biodiversity strategy. However, seven (7) respondents identified some weaknesses that they felt needed to be corrected to improve the efficacy of the traditional strategy. Their major concern was with the general public embracing the reverence associated with some biodiversity species. They admitted that this approach would mean engaging in some form of religious rites under such trees periodically. This, they felt, would not entice Ghanaians who are Christians and Muslims. Upon deliberations with the conservationists and culturists, it

was successfully corrected. In societies where the belief in deities is significant, the deities were to be affiliated to the endemic species. On the other hand, it was agreed by the respondents that areas where people do not hold strong belief in deities, respected personalities and ancestors in the vicinity were to be affiliated to the endemic species to prevent their abuse.

Another weakness some of them pointed out was with the failure of the researcher to translate the document into the various local dialects to make the assimilation of its contents easy for the local people. One of the conservationists stated in his report:

The strategy is developed in a foreign language (English). I suggest that the document should be translated into our local dialects to transmit the information on biodiversity conservation to the grassroots. Also, the strategy must be further developed into simpler forms such as in flyers for them to be distributed to the smaller local communities. These are weaknesses because previous strategies and policies on the natural resources management in Ghana failed in its implementation because of poor dissemination and understanding of the document (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 19 December 2017).

It was agreed that these suggestions would be added as part of the recommendations put forward by the researcher to heighten the education and dissemination of the developed traditional biodiversity strategy especially in the local regions of Ghana.

### **Strengths of the developed Traditional Biodiversity Strategy in serving as a complement to the Scientific Conservation Strategy in Ghana**

All the 72 respondents expressed strong conviction that the traditional biodiversity strategy developed has much strength. The strengths many of the respondents highlighted were with the developed traditional biodiversity strategy catering for the lack of comprehensive traditional conservation approaches in the existing policies and strategies for biodiversity management in Ghana. They admitted that the document will enhance biodiversity conservation in Ghana by utilizing both traditional and scientific conservation approaches. This would lead to more holistic and maximized conservation efforts in managing biodiversity in Ghana. The conservationists stated:

The traditional biodiversity strategy will augment the existing scientific conservation approaches to arrest the fast depletion of biodiversity resources. It will ensure the holistic approach towards the sustainability of the biodiversity conservation. The document is indeed an awareness creation and a timely intervention toward the conservation of biodiversity through tradition (RMMM-PI, Written Report on the developed Traditional Biodiversity Strategy, 11 December 2017).

The developed traditional biodiversity strategy is well structured and ensures the involvement of traditional authorities in the management of biodiversity in Ghana. It is a valuable innovation because it utilizes the time-tested traditions of Ghanaians (EER-PI, Written Report on the developed Traditional Biodiversity Strategy, 14 December 2017).

Their views coincide empirically with the thoughts of Wilder et al. (2016) as well as Msuya and Kideghesho (2009) that a traditional strategy as a complement to scientific conservation approaches would ensure a holistic and sustainable utilization of biodiversity. Also, better results in conservation efforts are achieved (Adom 2016a) and a more constructive approach (Sinclair et al. 2010) to biodiversity management is achieved.

Other respondents also mentioned that the strengths of the developed traditional biodiversity strategy are with its comprehensiveness in educating both the local people and the elite in the Ghanaian community as well as the effective utilization of the effective traditional conservation approaches. Also, the respondents indicated that the innovatively designed traditional biodiversity strategy suggests a strong collaboration between all the major stakeholders in biodiversity management in Ghana. They indicated that this collaboration would ensure the smooth implementation of the strategy. This concurs with the position of Ajani et al. (2013) that effective collaboration between conservationists and local people as well as the utilization of the conservation wisdom in their cultural and artistic elements would encourage the highest level of local participation in biodiversity conservation programmes.

Also, the conservationists admitted that the strategic action plans in the developed traditional biodiversity strategy are specific, measurable, achievable, and result-oriented. They are straight to the point and task appropriate implementation agencies and/or actors to deal with specific problems.

The head of one of the conservation agencies mentioned another strength of the developed traditional biodiversity strategy as showing global ties and affiliations with other traditional knowledge systems implemented by other countries. This internationalizes the document and parallels it with its counterparts globally. He added that the document makes good use of the good examples in traditional biodiversity conservation approaches by other successful global countries.

Other respondents were fascinated about the complementation of the strategic action plans in the developed traditional biodiversity strategy with the scientific models and directions in the existing national biodiversity-related policies and strategies. The conservationists contended in their written reports that this approach would make its mainstreaming into the existing legal frameworks easy.

## **Conclusion**

The developed traditional biodiversity conservation strategy is to cater for the marginalized inclusion and implicit mention of traditional knowledge systems for conservation in the existing biodiversity-related policies in Ghana. It is hoped that the detailed directions given in this document would serve as a viable complement to the scientific conservation models in the existing biodiversity policies. The document is not to usurp the plans and programs in the existing policies for biodiversity. It is rather addressing the deficiencies in the traditional knowledge component which has been a dire challenge as indicated in the recently released 2016 National Biodiversity Strategy and Action Plan. It is not a conclusive document. It is still a strategic document under development. Thus, it is open to constructive suggestions, inputs, deletions and criticisms that would enhance and improve its efficacy to better serve its sole aims and objectives. The views of experts, conservationists, culturists and researchers in traditional knowledge systems in biodiversity conservation are welcomed. It is the earnest hope of the researcher that this document would play indispensable roles in helping save Ghana's biodiversity, especially, the few remnant biodiversity hotspots in the pristine forest tracts populous in the local regions of the country.

## **References**

- Ababio, S. (2014). *The Role of Indigenous Beliefs and Cultural Practices for Forest Conservation and Sustainability* (Unpublished Thesis, Kumasi). Kwame Nkrumah University of Science and Technology
- Adom, D. (2014). *General knowledge in art for senior high schools*. Kumasi: Adom Series Publications.
- Adom, D. (2016a). Asante indigenous knowledge systems: repositories of conservation ethics for Ghana's biodiversity. In *Proceedings of the academic conference of Interdisciplinary Approach* (Vol. 7, No. 2).
- Adom, D. (2016b). Inclusion of Local People and Their Cultural Practices in Biodiversity Conservation: Lessons from Successful Nations. *American Journal of Environmental Protection*, 4(3), 67-78.
- Adom, D., Asante, E. A., Kquofi, S. & Arthur, N. A. P. (2018). The Conservation Ethos in the Asante Cultural and Artistic Elements for the Management of Ghana's Biodiversity. *International Journal of Humanities and Social Science Review*, 4(3), 1-22.
- Adom, D., & Kquofi, S. (2016). The High Impacts of Asante Indigenous Knowledge in Biodiversity Conservation Issues in Ghana: The Case of the Abono and Essumeja Townships in Ashanti Region. *British Journal of Environmental Sciences*, 4(3), 63-78.
- Ajani, E. N., Mgbenka, R. N., & Okeke, M. N. (2013). Use of Indigenous Knowledge as A Strategy for Climate Change Adaptation among Farmers in Sub-Sahara Africa: Implication for Policy. *Asian Journal of Agricultural Extension, Economics & Sociology*, 2(1), 23-40.
- Amanor, K. S. (2000). *Civil Society Participation in Forestry Policy Dialogue, The Perspective of Farmers*. Forest Farming Series (No. 1, pp. 1-65). Forestry Department, Accra, Ghana.
- Anderson, G. (2015). Traditional Akan Ethics: Relevant or Trash to Ghanaians Today? *International Journal of Humanities and Social Sciences*, 4(1), 7-12.
- Angen, M. J. (2000). Evaluating Interpretive Inquiry: Reviewing the Validity Debate and Opening the Dialogue. *Qualitative Health Research*, 10(3), 378-395
- Asante, E. A., Adom, D., & Arthur, N. A. P. (2017). Promoting Environmental and Infrastructural Development Through Selected Cultural Practices (pp. 561-579). 6th International Conference on Infrastructural Development in Africa.
- Asare, A. B. (2000). Operational Guidelines on Community Forest Committees (pp. 6-8). ITTO/FSD Collaborative Off-Reserve Forest Management Project, Resource Management Support Centre, Kumasi.



- Attuquayefio, D. K., & Fobil, J. N. (2005). An Overview of Biodiversity Conservation in Ghana: Challenges and Prospects. *West African Journal of Applied Ecology*, 7, 1-18.
- Awuah-Nyamekye, S. (2013). *Managing the Environmental Crisis in Ghana: The Role of African Traditional Religion and Culture- A Case Study of Berekum Traditional Area*. Doctoral Thesis. United Kingdom: University of Leeds.
- Bardach, E. (2012). *A Practical Guide for Policy Analysis (The Eightfold Path to More Effective Problem Solving, 4th ed.)* Washington DC: SAGE Publications
- Berkes, F. (2012). *Sacred Ecology (3rd ed.)*. New York: Routledge.
- Betsson, C. (2010). *Protecting Biodiversity*. Retrieved from [http://www. Feelfriendly.com](http://www.Feelfriendly.com)
- Boamah, A. D. (2015). *Akan Indigenous Religio-Cultural Beliefs and Environmental Preservation: The Role of Taboos*. Canada: Queens University.
- Boateng, B. A. (1998). Traditional Conservation Practices: Ghana's Example. *Institute of African Studies Research Review*, 14(1), 42-51
- Bonye, Z. S. (2007). *Harnessing Synergies: The Role of Traditional Institutions in Natural Resource Management in The Tallensi/Nabdam District Upper East Region (Master's thesis)*. University of Development Studies, Tamale, Ghana.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27-40.
- Breuer, D. (2002). *Community Participation in Local Health and Sustainable Development Approaches and Techniques*. European Sustainable Development and Health Series 4, EUR/ICP/POLC.
- Chalk, J. R. (2006). *Genesis 1-11 and the African worldview: Conflict or Conformity (PhD Thesis)*. South Africa: University of South Africa.
- China NBSAP. (2011). *National Biodiversity Strategy and Action Plan*. China: Biodiversity Office, SEPA
- Crespi, V. M., & Richards, G. (2007). The Meanings of Cultural Festivals. *International Journal of Cultural Policy*, 13(1), 103-122.
- Cudny, W. (2013). Festival Tourism-The Concept, Key Functions, and Dysfunctions in the Context of Tourism Geography Studies. *Geographical Journal*, 65, 105-118.
- De Koninck, V. (2005). Joint management of Banteng in a Contested Cultural Landscape: Observations and Implications. *Human Dimensions of Wildlife*, 10(2), 123-135.
- Diawuo, F., & Issifu, A. K. (2015). Exploring the African traditional belief systems in natural

resource conservation and management in Ghana. *The Journal of Pan African Studies*, 8(9), 115-131.

Falasi, A. (1987). *Festival: Definition and Morphology*. In A. Falasi (Ed.), *Time Out of Time* (pp. 1-10). Albuquerque: University of New Mexico Press.

Fraenkel, J., Wallen, N., & Hyun, H. (2012). *How to Design and Evaluate Research in Education* (8th ed.). New York: Mc Graw-Hill Companies

Gadzekpo, A. (2013). *Cultural Innovation for Sustainability in Ghana: Back to Proverbial Wisdom*. Dubrovnik: Inter University Centre. Retrieved from <http://www.ceres21.org>

Ghana National Biodiversity Strategy and Action Plan (NBSAP). (2016). *National Biodiversity Strategy*. Ghana: Ministry of Environment, Science, Technology and Innovation.

Gumo, S., Gisege, S. O., Raballah, E., & Ouma, C. (2012). Communicating African Spirituality through Ecology: Challenges and Prospects for the 21st Century. *Religions*, 3, 523-543.

Hedlund-de Witt, A. (2013). *Worldviews and the Transformation to Sustainable Societies* (PhD Thesis). Amsterdam: Vrije Universiteit Amsterdam.

India NBSAP. (2008). *National Biodiversity Strategy and Action Plan*. Ministry of Environment, Forests and Climate Change. India: Government of India

Infield, M., & Mugisha, A. (2013). *Culture, values and conservation: a review of perspectives, policies and practices*. Fauna & Flora International, Cambridge UK, 2.

Ingold, T. (1992). *Culture and the Perception of the Environment*. In E. Croll, & D. Parkin (Eds.), *Bush Base, Forest Farm*. London: Routledge

International Institute for Environment and Development (IIED). (1992). *Indigenous Knowledge, Biodiversity Conservation and Development*. Retrieved from [www.iied.org](http://www.iied.org)

Johnson, M. (1992). *Research on Traditional Knowledge: Its Development and Its Role In* M. Johnson (Ed.), *Lore: Capturing Traditional Environmental Knowledge* (pp. 3-27). Ottawa: International Development Research Centre.

Kehinde, O. (2013). African Religion and Environmental Dynamics. *Journal of Studies in Social Sciences*, 4(2), 199–212

Kenyan National Biodiversity Strategy and Action Plan (NBSAP). (2000). Ministry of Environment and Natural Resources. Nairobi-Kenya: The National Environment and Natural Resources.

Kumekpor, K. B. (2002). *Research Methods & Techniques of Social Research*. Ghana: SonLife Printing Press and Services.

- Lacono, J., Brown, A. P., & Holtham, C. (2009). Research Methods- A Case Example of Participant Observation. *Electronic Journal of Business Research Methods*, 7(1), 39-46.
- Leedy, P. D., & Ormrod, J. E. (2010). *Practical Research: Planning and Design* (9th ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.
- Materer, S., Valdivia, C., & Gilles, J. (2002). *Indigenous Knowledge Systems: Characteristics and Importance to Climatic Uncertainty*. Department of Agricultural Economics Working Paper No. AEW2001-2003. Columbia: University of Missouri.
- Mertens, D. M. (2007). Transformative Paradigm: Mixed Methods and Social Justice. *Journal of Mixed Methods Research*, 1(2), 212-225
- Milton, K. (1996). *Environmentalism and Culture Theory: Exploring the Role of Anthropology in Environmental Discourse*. London: Routledge Taylor and Francis Group.
- Moller, H., Berkes, F., Lyver, P. O. B., & Kislalioglu, M. (2004). Combining science and traditional ecological knowledge: monitoring populations for co-management. *Ecology and Society*, 9(3), 2-8.
- Msuya, T. S., & Kideghesho, J. R. (2009). The Role of Traditional Management Practices in Enhancing Sustainable Use and Conservation of Medicinal Plants in West Usambara Mountains, Tanzania. *Tropical Conservation Science*, 2(1), 88-105
- Odotei, I. (2002). Festivals in Ghana: Continuity, Transformation, and Politicization of Tradition. *Transactions of the Historical Society of Ghana, New Series*, 6, 17-34
- Olaide, I. A., & Omolere, O. W. (2005). Management of indigenous knowledge as a catalyst towards improved information accessibility to local communities: a literature review. *Chin. Librarianship Int. Electron. J*, 35, 87-98.
- Osei, J. (2006). The Value of African Taboos for Biodiversity and Sustainable Development. *Journal of Sustainable Development in Africa*, 8(3), 42-61
- O'Sullivan, D., & Jackson, M. J. (2002). Festival Tourism: A Contributor to Sustainable Local Economic Development? *Journal of Sustainable Tourism*, 10, 325-342.
- Pietkiewicz, I., & Smith, J. A. (2014). A Practical Guide to Using Interpretative Phenomenological Analysis in Qualitative Research Psychology. *Psychological Journal*, 20(1), 7-14.
- Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative Research: Analysing Qualitative Data. *British Medical Journal*, 320, 114-116.
- Rasul, S. (2015). Gender and Power Relationships in The Language of Proverbs: Image of Woman. *FNU Journal of Social Sciences*, 9(2), 53-62.
- Rim-Rukeh, A., Irerhievwie, G., & Agbozu, I. E. (2013). Traditional Beliefs and Conservation of

- Natural Resources: Evidences from Selected Communities in Delta State, Nigeria. *International Journal of Biodiversity Conservation*, 5(7), 426-432
- Sanauddin, N. (2015). *Proverbs and Patriarchy: Analysis of Linguistic Sexism and Gender Relations among the Pashtuns of Pakistan* (PhD Thesis). Scotland: University of Glasgow.
- Schultz, P. W. (2002). Environmental Attitudes and Behaviours Across Cultures. *Online Readings in Psychology and Culture*, 8(1), 1-13.
- Silka, L. (2005). *Building Culturally Competent Research Partnerships*. Paper presented at the annual meeting of the American Psychological Association, Washington, DC.
- Sinclair, J. R., Tuke, L., & Opiang, M. (2010). What the Local Know: Comparing Traditional and Scientific Knowledge of Megapodes in Melanesia. In S. Tidemann, A. Gosler, & R. Gosford (Eds.), *Ethno-Ornithology: Global Studies in Indigenous Ornithology: Culture, Society and Conservation*. London: Earthscan.
- Smith, E. A., & Wishnie, M. (2000). Conservation and Subsistence in Small-Scale Societies. *Annual Reviews Anthropology*, 29, 493-524.
- Smith, J. A., & Osborn, M. (2008). *Interpretive Phenomenological Analysis*. In J. Smith (Ed.), *Qualitative Psychology: A Practical Guide to Research Methods*. London: SAGE Publications.
- Soini, K., & Dessein, J. (2016). Culture-Sustainability Relation: Towards a Conceptual Framework. *Sustainability*, 8, 167.
- Taringa, N. (2006). How Environmental is African Traditional Religion? *Exchange*, 35(2), 191–214.
- Teye, J. K. (2008). *Forest Resource Management in Ghana: An Analysis of Policy and Institutions* (Ph.D Thesis). England: The University of Leeds
- U.S. E.P.A. (2002). *Community, Culture and the Environment, A Guide for Understanding a Sense of Place*. Washington DC: United States Environmental Protection Agency.
- UNESCO. (2003). *Cultural Diversity and Biodiversity for Sustainable Development*. Retrieved from <http://www.unesco.org>
- UNESCO. (2012). *Culture: A Driver and An Enabler of Sustainable Development*. Retrieved from [www.un.org](http://www.un.org)>pdf>2\_culture
- Warren, D. M. (1991). *Using Indigenous Knowledge in Agricultural Development*. World Bank Discussion Paper No.127. Washington DC: The World Bank.
- Wilder, B. T., O'Meara, C., Monti, L., & Nabhan, G. P. (2016). The Importance of Indigenous Knowledge in Curbing the Loss of Language and Biodiversity. *BioScience*, 66(6), 449–509.

Witoszek, N. (2013). *Religion and Ecodmodernity*. Oslo: Norwegian University Press.

Xue, D. (2008). *Categories of Traditional Knowledge Associated with Protection and Sustainable Use of Biodiversity in Minority Areas of China*. College of Life and Environmental Science, Minzu University of China, Beijing.

Yanow, D. (2000). *Conducting Interpretive Policy Analysis*. Thousand Oaks, California: SAGE Publications

