

PRACTICAL CHALLENGES IN MANAGING TRADITIONAL NATURAL RESOURCE COMMONS

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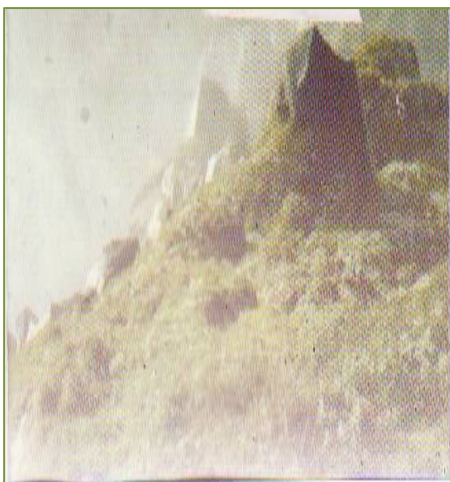
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INTRODUCTION

The total area of Ghana is estimated at 23.9 million hectares of which 15.7 million hectares lie within the Savanna Zone while the remaining 8.2 million hectares lie within the tropical High Forest Zone (Ministry Of Lands And Forestry-MLF Ghana). Ghana is located on the West coast of Africa, along the gulf of Guinea and the Greenwich Meridian. Ghana is boarded by Burkina Faso to the north, Cote de Voire to the west, Togo to the east and to the south, the Atlantic Ocean that lies precisely on latitude (4-11.5) north and longitude (3.11) west, (1.11) east. In fact it is at the centre of the earth geographically. Hence a paper that spells out practical issues which borders on its natural resources is worth presenting. Not to mention the closeness of the Akuapem Mountains to the National capital of Ghana. Managing of natural resources poses a number of practical challenges due to a wide range of factors; religious believes , location of resource, biodiversity, cultural diversity of the indigenous dwellers, just to mention but a few. Akuapem Mountain has been chosen on this basis. Akuapem is about 40 kilometers north from the capital of Ghana (Accra) it is in a region called the Eastern Region. Located here is the Akuapem Mountain.

The identification of the practical management challenges will in no doubt help give or provide effective management in and around Akuapem mountain forest. This paper seeks to use this appropriate platform to highlight the major challenges. And to help Provide effective management for the Akuapem Mountain, for maximum benefit of the Akuapem Mountain



.Akuapem Mountains at a glance

Major categories of Land use in Ghana

CATEGORY LAND AREA	(%) OF TOTAL
1. Forest Reserves	11%
2. Wildlife Reserves	5%
3. Unreserved High Forest	2%
4. Savanna Woodlands	30%
5. Tree Crop Cover	7%
6. Unimproved Pasture	5%
7. Bush Fallow and land for other uses	25%
8. Urban and others	15%

The benefit of natural resources such as the Akuapem Mountain in Ghana is recognized by stake holders. There is therefore the need to make this known to the rest of the world and to encourage and receive their support in giving or providing effective management in and around the mountain forest. The mountain forest in Akuapem has peculiar characteristics and challenges in terms of management. However, some challenges are common, comparing with other mountains in the world hence, can be replicated for others after this paper has been studied and understood properly.

Akuapem mountain Natural resources play an important role in the socio-economic development of Ghana in general and to the people of Akuapem specifically. The benefits from the Akuapem mountain areas are prominent. A few are listed below:

1. Wood fuel for domestic and industrial energy
2. Industrial wood products, which contribute 5-6% to GDP and rank 4th to Gold Tourism, Cocoa in Ghana's export earnings.
3. Foods, such as honey, mushroom, fruits and bush meat.
4. Fodder for sheep, cattle and goats.
5. Raw materials for pharmaceutical products.
6. Other non-wood products such as fibers, rubber and gums
7. In addition, it constitute a priceless ecological heritage, protecting land and water resources, controlling floods, warding off wind erosion, storing and water resources, controlling and recycling carbon and providing habitat for wildlife, as well as
8. A rich stock of valuable genetic resources.

RELIGIOUS BELIEVES



Elders and people pouring libation at the Akuapem Mountain

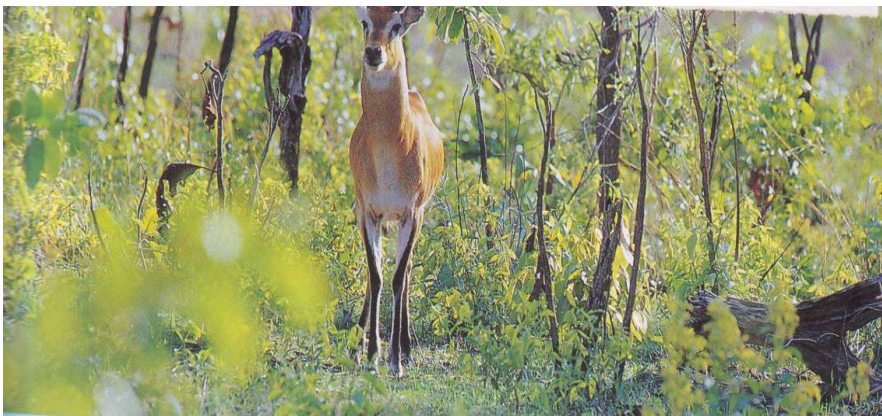
The visible mountain in relation to the surrounding landscape invokes strong feelings of appreciation, joy and awe in most of the people of the Akuapem mountain community. A major section regards the mountains as spiritual. And this is portrayed in their attitude during festivals and general pouring of libation. This over the years has culminated into serious attention and high sacredness traditionally. The people see Akuapem Mountains as that sacred hence effort to further develop it is perceived as religious abomination. The metaphysical quality of the mountains gives special responsibilities to managers, particularly since the religious sensitivity must be taken into account. Indeed, there are often serious conflicts between those to whom the mountain is sacred and those who think otherwise or propose any change to the Landscape. However the rich culture of the area is an attraction to visitors, the managers must try to control access and reduce multiple human impacts. Managing Akuapem Mountains then means liaising with the Chiefs and people to address effect in disharmony between traditional believes and management.

LOCATION OF RESOURCE

Even though The Akuapem Mountain is located 40 km away from the country's capital, administration is effectively centralized. The ministry of tourism and the Ministry of Lands and Forestry are in charge of the day to day management of the natural resource indirectly. Arguably the chieftaincy serves as the informal and localized administrative body. Co-management is a possible way out. That is the dwellers around the mountain being made part of the managing of the resource. They have to be made to understand management and the need for effectiveness. It is a practical challenge because it calls for monitoring of all afore-

mentioned (ministries and seat of local authority) which are located in Accra and community respectively. Again distance of 40km means few minutes drive from Accra which has so much population and movement of people to the mountain site.

BIODIVERSITY



Biodiversity in Display

CULTURAL DIVERSITY OF THE INDIGENOUS DWELLERS

DEFORESTATION

Deforestation is the (deliberate) removal of natural forest by human activities. It is the resultant change in forest land-use resulting from socio-economic pressures. This change has been largely aggravated by land clearing for agriculture, bush fires, excessive logging, settlements or urbanization and mining activities. About a third of Ghana's forest is estimated to have disappeared between 1955 and 1972 (a period Of 17 years).

CAUSES OF DEFORESTATION

There are several causes for deforestation in the most significant of which are:

1. Clearing more land for agriculture: As a result of declining of available agricultural lands, due largely to lack of improved farming methods (mainly slash and burn) under shifting cultivation system, has resulted in shorter fallow periods. This situation coupled with the rapid expansion of the country's population over the last few decades has

resulted in large tract of forest been encroached upon for the purposes of farming. About 70% of the deforestation is attributed to clearing land for agriculture. Such pressures are unlikely to abate and farms which prevent regenerating phases of the vegetation are likely to increase with increasing pollution growth.

2. Increased need and use of fuel wood: Large tracts of forests particularly in the transitional zone (parts of Brong Ahafo, Ashanti & Eastern Regions) are being devastated for supplies of wood fuel, mainly charcoal and firewood, which is mostly used for both domestic and commercial energy needs most of the rural population and the urban poor have resorted to this form of energy because of conventional forms of energy such as gas and electricity have gone beyond their affordable limits.
3. Commercial logging: Over the past four decades Ghana has experienced rapid expansion in its timber industry and as result more economic species of timber are needed to supply raw material to feed these industries. There is therefore the tendency to resort to over cutting of the Annual Allowable Cut through illegal logging. Coupled with this is the menace of illegal chain saw timber operations, which the country has had to grapple with as a result of the vacuum created by conventional sawmills in the domestic market. The existing sawmills have failed to supply the required timber for domestic, constructional, commercial and industrial uses.
4. Effects of bush fires: Wildfires are also one of the major causes of deforestation in Ghana. Intention fires (used as a management tool) are set in vegetations. Although this management practice has been in used since time immemorial, it has a negative influence on forest regeneration. Unintentional fire result from the activities of hunters, palm wine tappers, farmers etc. Record indicates that only 20% of the forest zone that is currently covered by forest has not burnt regularly. The dramatic increase in the number and severity of wildfires has destroyed last tract of forest in the transitional zone, part of Brong Ahafo and Ashanti Regions. Fire is perhaps the most important single threat to the integrity of Ghana. In recent years, Ghana has lost an ever-increasing percentage of its GDP to the indiscriminate ravages of fire. In 1994 alone, losses to forest fire amounted to more than \$97 million, which is equivalent to 2% of the country's entire GDP. The annual loss of revenue from merchantable timber from fire is currently estimated at \$24 million. These figures could be as much as double what is approximately half of the wildfires in Ghana go unreported. Fires are at present main threat to long-term conservation of the forest resources and biodiversity in Ghana.
5. Poor land use policies/practices: This is due to lack of coordination/collaboration between the various natural resource institutions in the implementation of their various policies and programmes as a result of the absence of the land use plan for the country. This has resulted in the duplication of efforts, waste of resources and lack of appropriate framework of combating deforestation in Ghana.
6. Mining: Open cast mining for minerals (gold, diamond, bauxite and manganese) by both small scale and large pose serious threat to forest in Ghana. Gold mining pose the

greatest threat to forest reserves in and around the genetic hotspot of the wet evergreen zone. A case in point is the large scale encroachment taken place on the northern end of Neung North Forest Reserve.

7. Settlement & Infrastructure: As towns and villages expand the roads are constructed, land (including forested lands) is cleared. Statistics show that in 1948 there were 39 towns in Ghana with a total of 525,000 people or almost 13% of the national population. The number of towns rose to 98 in the 60s and has been increasing ever since. There has been a lot of road net-works through forested areas to increase accessibility.

MEASURES TO CONTROL DEFORESTATION

Recognizing the critical role the forest play in the socio-economic development of the country, Ghana adopted a new forest and wildlife policy in 1994 and since then the ministry has put in place concrete programmes to encourage reforestation of the ecologically degraded farm lands. The measures include a forest plantation development which is private sector led and supported by the government and other foreign development partners under an adaptable ten-year lending project, Natural Resources Management Programme. The strategy is intended to supplement production of industrial timber, increase the opportunity for carbon sequestration that would reduce green house gases and global warming.

Under the forest Plantation Development Project the rate of plantation establishment should rise to about ten thousand hectares annually. This is expected to increase as resources become available and enthusiasm begin whipped up by the Ministry in plantation establishment is accepted by the private sector. To this effect the government has made available about US \$ 8million, which was generated from levies on air-dried Lumber export, for financial and technical assistance to the private sector to kick start the project.

In addition, the Ministry is enforcing the provision of Timber Resource Management Act, 1997 (Act .547) and Timber Resources Management Regulations, 1998 (LI 1649) which requires timber utilization contract holders to uptake afforestation as a condition for exercising timber harvesting rights in the natural forest. It is expected that enforcement of this measure will complement the plantation development project being executed by the private sector.

The Ministry in collaboration with Ghana National Fire Service and the local communities and with assistance of the Royal Netherlands Embassy is embarking on Wild Fire Control Project in the Transitional Zone where the incidence of fire is very high much emphasis is being given to this project because it has been realized that forest fire constitute a major threat to existing natural stands as well as the success of the forest plantation development programmes.

The Ministry with support of Danida under the Natural Resources Management programme has embarked on a project to provide sustained wood energy particularly rural energy supplies, from the existing forest estates. This programme is being implemented in collaboration with local communities and District Assemblies and also involves the

establishment of private and communal woodlots, which will provide traditional wood fuels, supply to the rural communities and also the urban poor.

The Ministry has put in place measures to widespread surface gold mining activities by restricting such mining activities to only 2% of the forest estate of the country. In addition companies which intend to operate surface mining on reserve activities are required to submit a comprehensive environmental impact assessment approved by the Environmental Protection Agency before they are permitted to operate in such areas. This measure is intended to shift most mining activities to underground in order to protect the forest estate and the environment at large.

The Ministry is also assisting the Ministry of Food & Agriculture to intensify agro-forestry programmes in all farming areas as a means of reducing pressure on the existing forest. In addition improved farming practices are being adopted to limit the effects of the prevailing slash and burn farming cultural practice by local farmers, which also contribute significantly to deforestation in the country.

In collaboration with other stake holders the Ministry has prepared a draft Land use Plan for the country and when adopted, it is expected to ensure judicious as well as sustainable management of natural resources including forests.

The Ministry has adopted other complementary policy measures to help control the rate of deforestation and to assist the sustainable management of the country's forest resources.

These include:

- Institution of strict control measures in the harvesting of timber, including heavy sanctions for forest operations offenders;
- Management and effective controls on the utilization of savanna wood land resources.
- Active community participation and collaboration in the management and utilization of forest resources.
- Institution of public educational programme on the need to plant more trees.

On the protection and management of ecosystem, the Ministry has undertaken on a programme to demarcate, manage and protect biologically significant areas within the forest areas. This includes special areas for Wildlife, ecosystem and genetic resource value and also ensuring effective partnership with the local people in the management of these areas.

Current Challenges (Forest & Wildlife)

- o Although comprehensive systems such as the VPA is being developed to reduce illegality in forest reserves, the off-reserve areas still pose as challenge
- o Laissez-faire attitude of some farming communities towards maintenance of established plantations

- Wildfire and activities of Fulani herdsmen remain a major threat in the establishment of forest plantations

Way forward (Forest and Wildlife)

To address these problems the Ministry plans to:

- All stakeholders identified in Wildlife will be brought on board as foreseen in the wildfire Policy.
- The Ministry is procuring twelve (12) for tenders as well as community fire fighting tools estimated at one million Euros (€1.0M) to suppress and control wildfires
- The Ministry will liaise with appropriate authorities on the implementation of ECOWAS protocol on movement of cattle and grazing

CONSTRAINTS TO COMBATING DEFORESTATION

There are number of constraints to combating deforestation in the country. These include;

- (a) International trade and global economic pressure. The structural adjustment programme being pursued by the country requires that we export more in order to earn enough foreign exchange to service the interest on loans contracted by the government and also pay external debt. Most exports are in variably natural resource based, such as timber, gold and agricultural produce. This has hastened the exploitation of forest resources.
- (b) Another constraint to the combating deforestation is the lack of adequate resource in terms of funds and inputs to embark on large-scale afforestation and reforestation as well as agricultural improvement programme to stem the high rate of deforestation.
- (c) Lack of public awareness of the negative impact that deforestation has on the development of the country.
- (d) Population growth .High population growth of (about 3% per annum) has brought about pressure to exploit more forest lands for farming and other economic activities.
- (e) Widespread poverty particularly in the rural areas of the country has exacerbated and intensified pressure on natural resources exploitation to satisfy basic needs.

These constraints need urgent attention as prerequisite for any successful programme to control deforestation in the country.

Providing effective management for these large areas of protected mountain lands presents challenge since they range from Sagamatha(the world's highest mountain) to Kailas (the most sacred), and the tropical cloud forested Rewenzoris in Uganda, to the cold temperate

pinnacles of Chile's Torres Del Paine. Each site has its own characteristics and problems, but there are some common attributes that make lessons learnt in one mountain regions transferable somewhere and enable basic guide lines for management to be proposed. This article considers the special challenges of managing protected area in mountain environments.

BIODIVERSITY CONSIDERATIONS

The three- dimensional nature of the mountains, with altitudinal zoning of biotic environments, together with differing orientations results in considerable heterogeneity in habits and hence flora and fauna, over relatively short distances. Thus, there is great biodiversity in the mountains and there may also be significant variation and speciation owing to high levels of ultraviolet radiation. This heterogeneity over relatively small areas precludes easy, broad prescriptions for management. Not only is there great biodiversity but the flora and fauna of the Akaupem mountain may be quite isolated from the corresponding zone in the next mountain in the range. This has been one of the factors responsible for high degree of endemism in mountains. Pei Shengji, who had described the facto protection given to the forests of the Holy Hills of Xishuangbanna, Yunnan, by the Dai people (Pei, 1993), reported that at the fair in Dali he identified 170 species of useful plants from the mountain forests, brought for sale or exchange (Pei, Personal communication, 1994).Mares (1992) has shown that although the eastern slope of the Andean montane forest is only 3.2 percent of the continent, it holds 63 percent of its endemic animal species.

INDIGENOUS DWELLERS

Mountains are home to a wide array of indigenous "highlands". Cultural diversity is a component of many locations where people live in or near a protected area and have tradition use and have traditional use rights. Indigenous people and traditional cultures are extremely important factors in planning, decision-making and cooperative management. The Anna-purna Conservation Area Project in Nepal is a good example of local involvement; the comanagement in Kluane National Park in Canada is another. Mountain protected areas are generally distant from the main centre of park administration. This has usually led to relative neglect in comparision with resources allocated to similar areas in lowland or marine environments. Communication between headquarters and remote areas has often been difficult, although recently introduced electronic systems tend to mitigate this. Even today, the remoteness of protected areas in the Himalaya or the kamchatka Mountain is a major administrative concern, and access is especially difficult during the season of snow accumulation which in high mountains, even in the tropics.

NATURAL HAZARDS

Natural hazards are a constant threat in mountain areas owing to steep slopes, torrents, volcanic activity, avalanches, glacier crevasses, landslides, glacial lake outbursts and earthquakes. High altitude alone is a health hazard and the dynamic landscape increases the risks of injury to visitors. Search and rescue operations are an important part of park management, and rescue attempts are greatly impeded by altitude, hostile climate and remoteness. The rapidly increasing influx into mountain areas, especially into less accessible locations, of poorly conditioned, inadequately prepared and badly equipped urbanites seeking mountain wilderness recreation is a major anxiety for park managers. The cellular phones and Global positioning system are no substitutes for good maps, a compass and good planning including contingency plans. It is interesting to note that, while in some regions avalanche control measures have focused on human safety, there is a new awareness of the positive value of recurring avalanches on natural habitats (Krajick, 1998). To ensure public health and safety, plans for possible emergencies, warning systems and rescue patrol need to be set up; such services are particularly well developed in North America and South Africa, and in some instances the costs of rescue must be paid by those who require aid.

FRESHWATER SUPPLY

As has been documented by Liniger, Weingartner and Grosjean (1998), mountains are the “water towers” of the world owing to enhanced precipitation and storage in the form of snow and ice. Protected areas play a key role in maintaining water quality and providing a naturally regulated flow, as for example in Canaima National Park in Venezuela. Managers have a clear responsibility to safeguard these upper watersheds, especially in terms of minimizing all types of pollution resulting from human impact. Eleven recommendations are presented in the publication *Guidelines for mountain-protected areas* (Poore, 1992). Where cloud forest occurs, these hydrologically and biologically important areas merit special protection, as an example on Mount Kinabalu, Sabah, Malaysia.

Mountain biotas, under constant climatic stress, are particularly vulnerable to climate changes and to exogenous air pollution, even from far away. The reduced snow cover of recent years ascribed to global warming is seriously affecting alpine flora in New Zealand and Australian parks. Severe damage by air pollution is well documented in the Czech and Polish national parks in the Giant Mountains (Flousek, 1997) and also in many other protected areas.

Illegal activities

In mountain areas the cultivation of illegal crops is uncommon—cocaine in the highlands of Peru and Colombia, opium and heroin in the Golden Triangle of Thailand/Myanmar/Loa People’s Democratic and the tribal areas of northwestern Pakistan, Marijuana on the slopes of Mauna Kea and Mauna Loa in Hawaii. Illicit activities in remote areas are a cause of concern for visitor’s safety and potential conversion of native vegetation to drug crops. Illegal hunting of

endangered or otherwise protected, wildlife is especially difficult to control in rugged remote topography.

Another common problem is the relatively poor database for design, planning and management. On account of their isolation and poor access mountain areas are usually the last selected for national survey and inventory of basic natural and cultural resources, even when local traditional knowledge is available. There is a great challenge, even in protected areas in developed countries, to capture local indigenous wisdom before the death of the community elders who serve as the repositories of such knowledge.

CHALLENGES FOR THE FUTURE

The major challenges for the twenty-first century are:

- To link together the isolated existing protected areas by conservation corridors along the mountain ranges. This not only increases effective sizes, but also provides migration corridors for gene flow and species movement. As the climate changes pole ward migration corridors in north-south ranges (e.g. The Andes) will better accommodate temperature change, and migration along the east west ranges (e.g. The Western Tien Shan) will be a response to rainfall changes
- To provide the greater altitudinal species movement, either by extending the boundaries of protected land farther down the mountain slopes or by establishing a buffer zone of protection around the core areas, as far into the lowlands as possible.

Principles and strategies for the design of more adequate protected areas to conserve habitats for rare species and to conserve biological diversity have been suggested by Noss in several publications (see, for example .Noss, 1991). There may be few new opportunities to designate additional areas that are strictly protected, such as national parks or conservancy reserves. Increasingly the task will be to advise cooperative ways of achieving and maintaining nature friendly management in areas now devoted to forestry, grazing and agriculture. New partnerships are needed between governmental agencies (e.g. common services), the private sector (e.g. ranchers.) and communities (e.g. common property areas or indigenous tribal lands in order to protect the environment (Miller and Hamilton,1998) .Proposals have recently been made to enlarge and link mountain protected areas with larger ecoregional corridors or ecozones. One of the earliest was in the central Appeninnes, using Abruzzo National Park as a neuclues with proposal to link it with seven other national or regional parks and a series of 21 small nature reserves, refuges and oasis,to create a conservation area of 600,000 ha (Tassi, 1994). One of the most ambitious projects is the Yellowstone-to –Yukon (USA/ Canada) corridor along the Mountains, at least 2100 km.

An excellent example of an altitudinal “corridor” is the recent establishment of controlled forest management units and conservation area that almost link Jigme Dorji National Park in the High Himal with Black Mountain and Royal Manas National Parks (All in Bhutan) and with India’s Manas Tiger Reserve in the subtropical lowlands (Minga Sherpa, personal communication, 1997). These initiatives and others were presented as global overview by Hamilton (1997). There appear to be about 38 proposals worldwide to establish mountain conservation corridors.

Jim Thorsell, senior adviser on world heritage with IUCN, envisions an inter hemispheric conservation corridor of the Americas, from Tierra Del Fuego to the Bering Strait; then, perhaps, through Beringia and on to Asia and into Europe (Thorsell, 1996). This may be a daunting challenge for proponents and managers of protected areas, but without vision little progress will be made. The Mountain Theme of the World Commission on Protected Areas within IUCN has adopted this concept, as well as the task of increasing management effectiveness of existing protected areas.

“Protected areas” as defined by IUCN include much more land than national parks and strict reserves, and managers or researchers working in any category of mountain “protected” areas are invited to join the Mountain Theme Network. For further information, please contact WCPA Vice-Chair for Mountains, 342 Bittersweet Lane, Charlotte, Vermont 05445, USA; e-mail: LSx2_Hamilton@together.org.

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The potential implication for climate change for culture, sacred landscapes and human spiritual activity receive little attention from the media, the scientific community, or the public. However most of the world cultures place significant value on the landscapes which depend on fragile ecosystems. In many cases people act as stewards and protectors of such ecosystems; their cultures and beliefs depend on such landscape and its particular form. Often the landscape

depends on their maintenance and protection of it, especially in a rapidly changing world. How will this change affect human interaction with the environment? What age-old knowledge and practices will be lost?

Mountain environments and societies that inhabit them are profoundly impacted by global warming. This threatens not only to destroy not only the natural environment but change the very nature of believe and ritual and even to alter sacred practices in these places. However, local knowledge can be tapped and mobilized in the service of conservation and environmental protection. Local communities are likely to be motivated activists and they know the landscape better than anyone else. They can thus work in close partnership with scientist and conservationist. Moreover, heightened awareness about the destruction of mountain ecosystems can help to motivate the wider concern for the survival of their cultures.

While it is sometimes large co-operations or states that directly threaten mountain peoples' societies, the perpetrators are more often invisible and their effects on mountain environments are indirect. Thus the actions that can be taken by mountain peoples' to protect the environment they consider sacred are often to take the form of publicity about their plight. Sacred mountain sites and landscapes hold a great deal of potential for generating awareness about climate change. In them we find a unique nexus of culture and environment through which it may be demonstrated how global warming affects people and culture.

Impacts

How does climate change affect human interaction with sacred mountain landscapes? Potential effects of climate change are of course diverse. To begin, changes are likely in the form, appearance and status of sacred lakes. This may include a potential water level rise or in the case of increased aridity or an irrigation, an evaporation and fall in water levels. A related process is in the decline of snowfields and glaciers associated with high-altitude sacred sites or with local beliefs about sacred mountains. A change in vegetation and greenery, whose intensity is often associated with particularly special sacred sites could be a culturally relevant impact of climate change. Among transhumant cultures we might see a different range of seasonal or daily movement between village and pasture, defined by snowmelt and therefore in altitude based zones of purity such as those found in Northern Pakistan. Other environment processes salient for cultural interaction with the landscape include deforestation, including that in highly-valued jungle and forest area; desertification, including formerly verdant mountain-sides; change in the course and water level of important and revered rivers; and the disappearance or diminution of certain animal species associated with spiritual beliefs and practices.

A through field examination of these dynamics would require an exploration of indigenous explanation for global warming, involving an in-depth ethnographic and ecological analysis of (1) local Cultural perceptions of climate change; (2) above and beyond perceptions alone , the

way that climate change has led to adaptations of behaviour and practice; and (3) the actual ecological that have occurred and are likely to occur.

Examples and manifestations

While research on the topic is scarce, it is not hard to find real examples of the many ways that climate change is likely to affect cultural interactions with the landscape. Examples of actual impacts of climate change on sacred landscapes, discourses and perceptions of such change and strategies and solutions for dealing with it are abundant. The Amarnath cave in Kashmir houses an ice lingam associated with Shiva. A yearly pilgrimage, a yatra, has as its destination the cave. Climate change has purportedly been associated with a diminished lingam. In the past two years, there was reported to be insufficient snowfall which, coupled with glacial recession, failed to form a full-fledged lingam. In 2006, a lingam suddenly appeared which some believed to have been fabricated. In 2007, only a very small one formed, which then melted before the yatra began. While there has been some controversy on this matter, locals and yatris have blamed global warming. The important point here is, the perception of the role of climate change in the realm of the sacred. Peru's Qolqepunku Glacier provides us with a particularly interesting example of the nexus between global warming and sacred mountains. The wall Street journal of 15th July 2005 ran an article entitled "The Ukukus Wonder Why Sacred Glacier melts in Peru's Andes: It could portend World's End, So Mountain Worshippers Are Stewarding the Ice. A Quenhua traditional pilgrimage of some 40,000 people, called El Senor de Qoyllur Rit'i, involves climbing to 16,000 feet to harvest large blocks of ice from a glacier to use as part of a festival. The glacier has retreated 600 feet recently and its retreat visible by the year. To appease the apu mountain gods here, pilgrims are now forbidden to extract ice from the glacier. They believe that the disappearance of the glacier is associated with the mountain god's departure. The water derived from the mountain ice is thought to have magical powers and to form the apu's semen for the fertilization of Mother Earth (Pacha Mama). Some indigenous Peruvians are said to associate the loss of the snow from mountain peaks with the end of the world.

In similar situation in Northwest Yunnan, the sacred Mingyong Glacier (Kawagebo to Tibetan Buddhist) on Mount Khawa Karpo(Meili Snow Mountain), whose presence is heralded by long threads of prayer flags, is disappearing. The Nature Conservancy point out a retreat of some 200 meters in four years with an increasing shrinkage rate. Mountain trees are slowly moving up the slopes. The faces not only the disappearance of the glacier but also treats to the villages down valley. The Nature Conservancy is with the villagers to adjust their activities in alpine areas to changing conditions.

In India, the sacred Ganges river is threatened by glacial retreat. The Washington Post ("A sacred River Endangered by Global warming," 17 June 2007) points out that the glacier at Gaumukh Gangotri supplies about 70 percent of the rivers water and that is shrinking by

about 120 feet per year. Predictions hold that the river will eventually become seasonal. As can be expected, many Hindu environmentalist movements have emerged around this issue.

A Mountain Forum electronic discussion points to a very interesting indigenous approach to climate change. In Northern Pakistan, the practice of artificial glacier grafting, in order to create a new glacier, is widespread. The conditions for this activity are very particular, and local people are beginning to understand and describe it as a counteracting measure to climate change. Glaciers provide water through ancient carved slopeside channels in these areas. Such practices as glacier grafting, and their preservation are essential for the provision of water in arid areas and are excellent ways to think about indigenous practices which can resist global climate change. Many of The contributors to the discussion broad from a number of mountain regions explicitly tied the attempt to take an action against global warming and made observations about the ways that it has changed in the context of climate change.

Strategies, Approaches, and Solutions

Mountain societies and the organizations that work with them are powerless to do something about this catastrophic transformation. It is imperative that experts in mountain areas begin to imagine and devise possible solutions and approaches to address the cultural implications of climate change. Potential awareness-generating activities and effective and strategies for advocacy can be modeled on past successes. Indigenous reforestation and ecological restoration programs such as those pursued by Chipko in India or the WWF in Northern Pakistan have proven powerful. National parks can be an excellent vehicle for demonstrating the natural and cultural value of landscapes and the mobilization of sister park relationships between national parks can exploit the solidarity inherent in that partnership. Sister park relationships can provide a forum for mountain people's to share a common experience and network common solutions, and for wider public audience to learn more about mountain areas.

Other effective solutions may include publicity campaigns demonstrating the loss of cultural heritage, which will accompany ecological destruction and sustainable tourism programme raising money for enhancing visibility of the struggle of cultures whose landscapes are being changed by global warming. Perhaps most promising however, are programmes which empower local societies to take action against climate change. Local inhabitants of affected areas can be mobilized as stewards of the environment with motivations for such couched in terms of cultural beliefs on sacred landscapes. Moreover, educational programme by inhabitants of threatened landscapes for outsiders explaining methods for sustainable resource use and to protect the environment from their perspective to generate concern among outsiders. Such programmes highlight the inseparable and intimate connection between people and landscape, between natural and cultural ecologies; they show that the fate of the environment and the fate of the human habitats are inextricably intertwined. Stewardship of one is stewardship of the other and both demand our attention

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The Mountain institute's mission is to advance mountain cultures and preserve mountain environment. Core initiatives includes conserving high priority ecosystems in the Andes, Appalachains and Himalaya mountain ranges, promoting environmentally and culturally sustainable livelihoods for the mountain communities and supporting the mountain agenda through advocacy, education and outreach for mountain communities.

Resource Conflict in Mountains:

Sources and Solutions

Conflicts in mountain develop when different needs compete with each over limited space and time and a more severe level, when international boundary issues arise in remote areas. From a political and geographical point of view, mountain represents a special environment in terms of topographic, social and economic constraints. Increasing pressures induce by anthropogenic change and uncertainty if climate change fosters the emergence of double-loop conflicts. These characteristically develop at the local scale. Often conflicts occur at the interface between traditional, primary activities and new developing economical activities that have a less environmentally sustainable approach towards natural resources. Nowadays the strain on sharing resources accelerates the tip-over point towards conflicts.

In this article the sources of conflict will be analyzed, a case study between a farmer and a tourism industry describe and possible conflicts resolutions and prevention suggested. The conclusion summarizes the current dimensions of the conflicts.

Sources of conflicts

There are many sources of conflicts in mountains and they have a number of common sources. Conflicts usually occur when some or all the physical, ecological, societal, cultural and economic fields confront each other. In the absence of shared knowledge of problem

and/or consensus major distress, resource shortage or even war can result. For example in the year 2000, 18 of the world's 28 armed conflicts took place in mountains (Smethurst, 2000). Conflicts characteristically occur at a very scale, as a result of increasing population pressure or from new problems associated with climate variability and uncertainty. They are typically caused by lack of cooperation between the public and the private sector and enterprises as well as opposing economic and ecological values. Moreover, long term versus short term visions can hide the dimension of a conflict.

Cultural, societal and ecological sources

In the Himalayas conflicts have developed between natural resources, private enterprise and government policies. For example, areas that have been transformed into nature reserves can no longer be exploited for gathering naturally medicinal herbs or for allowing tourists to traverse certain areas, so that the livelihood of locals is menaced.

Other societal conflict sources include population migration and immigration, resulting in population de-concentration and concentration and unequal age distribution with growing expectations versus needs (Zucca 2006). In this situation new incoming population can menace the cultural or economic value of local communities. Conflict often develops where there is lack of awareness, perception, understanding, acceptance, and evaluation of different needs or lack of information and communication. Indeed, stereotypical conservative approaches versus stakeholders participative approaches often result in clashes.

Physical, ecological, economical resources

Often it is the limited availability or misuse of natural resources that leads to conflicts, in particular where demand is higher than supply. Thus, for example, in order to maintain and ameliorate the tourism industry in mountains, more and more natural resources are exploited (Hudson, 1996) since climate change is simultaneously changing the supply and snow and more water resources have to be exploited to produce artificial snow to compensate for the decreasing supply of snow resources (de Jong 2007 b). Increasing water consumption by tourism is already putting a high pressure on water resources in addition to water intensive techniques compensating for lacking leaving less available for local communities and tourist resorts (de Jong 2007 a). At the same time, climate change is causing greater variability of water resources in the winter months so that less is available for different activities. Finally, once the demands for natural resources associated with these economic activities have surpassed the threshold of supply, a lack of the resource occurs and a conflict develops. An additional strain is imposed on the aquatic ecosystem when the minimal ecological discharge is not respected during time of water conflicts. Since mountains are important water suppliers for the lowlands

(Viviroli et al 2003) water conflict in the upper catchment may have far-reaching impacts.

Other example of conflicts concern land claims for pasture versus tourism infrastructure, such as housing and snow making infrastructure. The zonation and disintegration of core zones may involve conflict with wild life habitats. Other types of conflicts commonly develop between the requirement for minimal ecological discharge and the discharge of artificially regulated by hydropower and energy prices.

Case study of conflicts between farmer and tourism industry.

An actual example of conflicts in mountains is the case study of Courchevel, French Alps. Here a conflict has arisen over pasture size and quality between an alpine farmer and the tourism industry, more specifically the ski lift operators of the Trois valles (Casanova 2007) with increasing uncertainty of snow depth and duration due to climate change, more and more artificial is manufactured to compensate for lack of natural snow. This requires ever increasing amount of water which is increasingly derived from the explicit construction of artificial reservoirs. In this case study, two major points are associated with the conflicts. The first concerns the surface occupied by the construction side of large

Conflicts, resolution / prevention

Conflicts identification, prevention and resolution remain one of the most difficult tasks. Some issues that are important for resolving conflicts include the development of the creation of opportunities for multi stakeholder discussion, effective communication and planning, the creation of actual and potential scenarios for solving of conflicts within their environment.

One primary problem of conflict related to climate change and population pressure in mountain is the social denial of problem (Norgaard 2006). Scale comparisons dominate and conflicts are often trivialized locally due to over simplified statistical or divisional comparisons. Although sources of are frequently known, the problem is often ignored and an adaptation strategy resembling as a much as possible the business as usual scenario is selected. This often occurs independently of the environmental or economic cost-benefit consideration.

NATURAL RESOURCES AND ENVIRONMENTAL GOVERNANCE PROGRAMME (NREG)

Introduction

This document summarizes the major objectives and strategies that the Government of Ghana (GoG) is implementing in order to increase the contribution of natural resources (forestry, wildlife and mining sector) and the environmental sectors to the socio-economic development of Ghana.

Contribution of Natural Resource Sectors

In reviewing the broad spectrum of the natural resources sector, it should be noted that about 50% of Ghana's GDP is derived from sectors that are closely related to the natural resource base: agriculture & livestock (29%), forestry (7%), mining (5%), fisheries (4%), electricity and water (3%) and tourism (5%). The natural resources sector also provides significant employment to the economy. The timber industry for example provides direct employment to over 100,000 people. Besides, more than 2.5 million Ghanaians derive a livelihood from forestry. While the mining sector employs about 20,000 people in large scale mine and an estimated number of 500,000 operators in small scale mining. Additionally, the country's wildlife and woodlands provides critically important environmental services such as water, soil protection, protection of head water and water courses, micro climate regulations, habitat for endemic fauna and flora.

However, the performance of these productive sectors depends upon proper environmental governance and management.

Challenges Facing the Sectors

The natural resource and environmental sector are however faced with a number of challenges which has limited realization of their full potentials and also threatened sustainable use of the resources.

Ghana's natural resources, upon which so much of the country's activity and population livelihood depend, are being depleted at an alarming rate: according to Ghana Country Environment Analysis (CEA) Report in 2006, 50 percent of the original forest area has been converted to agricultural land by clearance for perennial or annual cropping and burn cultivation practices. Crop yield have stagnated, and productivity has declined because of rampant soil erosion. Fish, timber, and non-timber forest product stocks are decreasing rapidly. Coastal towns are facing severe water shortages during the dry season. Wildlife population and biodiversity are in serious decline. Health related pollution – indoor and outdoor air, water and sanitation issues have emerged as serious health threats for the majority of the population.

Recent estimates of the cost of natural resource and environmental degradation revealed in the Ghana Country Environmental Assessment (CEA) suggest that the equivalent of 9.6

percent of GDP is lost through unsustainable management of country's forest and through health cost to water supply and sanitation, indoor and outdoor air pollution.

Other challenges faced by the natural resource sector are, weak capacity of sector institutions to enforce good governance and lack of effective inter sectoral collaboration among the natural Resource sector leading to institutional inefficiencies.

Natural Resources and Environmental Governance Program (NREG)

In order to address these challenges, Government in the past embarked on a number of policy interventions and significant improvement have been made. These efforts will be complemented under the current sector support programme through the natural resources and environmental Governance Programme.

The objective of the Natural Resources Environment Governance Programme (NREG) is to address governance issues as regards to natural resources and environment with overall objective of ensuring sustainable economic growth, poverty alleviation, increasing revenues and improving environmental protection.

Through the development of a natural Resources ad Environmental Governance (NREG) programme, the World Bank, The Royal Netherlands Embassy (RNE), the French Development Agency (AFD), the EC and the Swiss (SECO) will support the forestry and wildlife, mining, and environment sector Ministries with funds channeled through the Ministry of Finance and Economic Planning. Within the framework of the NREG programme, these agencies will use these funds to implement priority actions to enable them to address the issues described above.

The programme expected to be financed with a 5 year sector budget support of approximately USD 60-80 million. The Sector Budget Support will consist of (i) transfers of financial resources to the national Treasury of the Government of Ghana (**GoG**) and (ii) a joint policy dialogue conducted by (GoG) and the signatory Development Partners (DPs) as regards to a number of crucial policy and strategy issues and the targets to be achieved in the (sub) sectors covered by the NREG programme. Progress assessment framework (PAF) will be used for measuring progress towards achieving the sector development goals and the annual targets. The PAF consist of three sector matrices; one for forestry, one for mining and one for environmental protection.

The Natural Resources and Environmental Governance (NREG) programme will address the challenges faced by the three natural resource sectors by the following strategies:

- (i) Improving governance of the sectors through capacity development and strengthening of the institutions to ensure effective policy formulation, implementation and law enforcement.

- (ii) Securing a predictable and sustainable financing mechanism responsible for the three sectors to ensure adequate availability of funds to carry out their functions effectively.

These strategies are consistent with government macro-economic policies as well as the growth and Poverty reduction Strategy (GPRS) II.

In line with government environmental policy as stated in GPRS II, government will promote an integrated ecosystem management as well as human resource diversity conservation initiatives. Other environmental policies as specified in the GPRS include enacting relevant environmental laws to protect the environment at all times, as well as enforcement of the existing environmental laws; and development of multi agency approach to enhance resource management and the environment. Government will also encourage reforestation of degraded forest and off-reserved areas.

With regard to the mining sector government will sustain the sector through continues exploitation and management of mineral resources; to improve the environmental and natural resources management for health and safety; collaborative management of mineral resources; and to promote the use of international best practices to enhance the competitiveness of the mining sector as a whole.

Sector Policy and Framework

1. Forestry and wildlife Sector

Natural resources management in Ghana is governed by

- (i) the forest and wildlife policy of 1994
- (ii) The Forestry Department master plan of (1996)
- (ii) The National Land Policy of (1999) and
- (iii) The National Wildlife

Policy of (2007).

The thrust of these policies is to ensure the conservation and sustainable development of the nation's natural resources for the maintenance of environmental quality and perpetual flow of optimum benefits to all segment of society.

Apart from the policies mentioned above the forestry sector is governed by a number of forest laws and regulations. The most prominent and widely used are the Timber

Resources Management Act, 1997 (Act 547 and its (amendment), Act, 2002 (Act 617), as well as the Timber Resources Management Regulations 1998 (L.I 1649) and its amendment, Timber Resources Management (Amendment) Regulations, 2002 (L.I 1071).

Specific challenges faced by the sector are, high illegal harvesting of Timber resources, ineffective sector law enforcement, insufficient involvement of communities in resource management and no predictable financing for the sector to carry out their required functions effectively. The result of these challenges is loss of biodiversity, critical revenue to government and finally reduction in economic growth.

2. Mining Sector

The general policy framework of the mining sector is to ensure that the country's mineral resources are managed on a sustainable economic, social and environmental basis by encouraging local and foreign private participation in the exploration and commercial exploitation of the country's mineral resources and ensuring an equitable sharing of financial and developmental benefits of mining between investors and all Ghanaian Stakeholders.

Secondly, to ensure that the administration of mining laws and regulations are carried out in a transparent manner is by developing streamline and effective institutional arrangement for a mining sector, that is integrated with other element of national economy, thereby contributing to the economic empowerment of Ghanaians by generating opportunities for local entrepreneurship, including small scale mining and increase demand for local goods and services in the mining sector.

The mining is governed by a ne more investment friendly Act; the minerals and mining Act 2006, Act 703. This Act is in line with international best practices in the industry as well take cognizance of stakeholder views. This and associated legislation combines regulation of the mining industry with fiscal incentives for investors.

One of the major challenges of the mining sector is the environmental damage resulting from mining activities especially by illegal small scale operators. Even though there are govern policies and institutions in place to ensure the protection of environment during and after mining operations, the issue is still a source of worry to Government because mined out areas are not rehabilitated.

Another area of grave concern is the lack of geologically viable area and financial support to small scale miners in Ghana, realizing the significant contribution to the in terms of employment generation. In fact, the regularization of small-scale mining needs to be deepened to ensure that all minable deposits in the country is in the country, especially gold, are exploited using appropriate technologies available.

3. Environmental Protection Agency(EPA)

The mandate by the EPA is protected by Act 490(1994), which stipulates nineteen Environmental Governance and Management functions that EPA has been established to perform.

The EPA mandate enjoins the agency to pursue an effective partnership and collaboration within relevant institutions and agencies. However the relationship between EPA and other partner organizations especially the MDAs is very weak. Environmental functions are dispersed across sectors and therefore require an effective inter-sectoral which is lack. There is also weak capacity of sector institutions to enforce environmental governance.

Sector Strategies

1. Forestry Sector

In order to ensure good governance in the forestry sector, the government has prioritize it's actions under four strategic policies as follows:

- * Securing the resource base
- * Developing the resource
- * Optimizing revenue from the resource and
- * Ensuring equitable benefits flow to all segments of society especially the resource owner.

Under the Natural Resources and Environmental Programme (NREG), specific policy actions will focus primarily on the following:

- i. Strengthening institutional capacity of the sector to ensure effective policy implementation and law enforcement; and
- ii. Securing predictable and sustainable financing of the forestry sector.
- iii. Promoting collaborative resource management.
- iv. Promoting forest and wildlife investments.
- v. Increasing supply of legal timber on the domestic market.
- vi. Securing the natural ecosystem.
- vii. Strengthening the monitoring and evaluation of information and communication technology.

Performance of the sector will be measured by the following specific expected outcomes:

- * Improved law enforcement in the forest sector evidenced by reduced level of illegality and at least 90 percent of timber exports verified as legal.
- * Secured and predictable revenue flows for the Forestry Commission.

- * At least 90 percent revenue collection rate achieved.

2. Mining Sector Strategy

The goal of Ghana mining sector is to “maximize the production and development of Ghana’s resources and create employment and wealth for the advancement of the Nation”. Government wishes to secure the continued development of a thriving mining industry that will contribute to the sustainable economic development based on the following objectives:

- Diversify the country’s export base and thereby increase foreign exchange earnings;
- Generate tax revenue to support development;
- Generate skilled employment
- Create demand for local goods and services
- Contribute to infrastructure development
- Produce raw material for local usage
- Contribute to the transformation of rural communities; and
- Serve as a catalyst for wider investment in the economy.

3. Environmental Protection Agency

The Environmental Protection Agency under the Natural Resources and Environmental Governance Programme are to:

- Improve environmental management
- Apply **SEA** to inform decision- making and mainstream environment in sectors
- Improve **EIA** procedures and compliance
- Effective decentralized environmental management
- Secure funding for **EPA**
- Strategic planning for **EPA** within **MLGRDE**
- Environmental monitoring and effective dissemination
- Civil society participation

Environmental policy

The government is very conscious of the implications of environmental degradation and has therefore signed a number of international conventions and treaties which guide environmental management in Ghana. In addition the Country Environmental Analysis (**CEA**) for Ghana (2006) provides estimates of the cost of environmental degradation and this has firmed up government’s commitment to reduce this cost-effective manner.

While increasing mineral production, Government has made it a priority to continuously address environmental issues, the more effective mitigation of negative environmental impacts of mining through the use of environmental impact assessment and strategic environmental plans is one area that is being addressed. Furthermore, adequate mine closure and post closure policies need to be developed.

It is Government firm resolve to institute without delay, this package of policy actions and strategies, described above so that it may start to have immediate bearing on the performance and productivity of Ghana's natural resources and environmental sectors. It is also hoped that the **NREG** programme will further strengthen the foundation and pave the way for an economically effective and finally stabilize the natural resource management sector.

There is the need for new approaches to sustainable management of the forests. The government has therefore reviewed its policies forestry agriculture, mining and energy sectors in order to address this problem with view to conserving and developing in Ghana's forest estate for the benefit of all segments of society.

1. Involvement of rural people in forest based industries.
2. Promotion of industries that use forest residues including local cottage industries.
3. Development of ways of using forest residues for energy generation.
4. Provision of training and demonstration on use of residues
5. Setting up market intelligence services.
6. Raising the quality of produce and the standard of processing and encourage high value added export and discouraging the export of unprocessed wood.

CONSERVATION OF FOREST ECOSYSTEMS (BIODIVERSITY)

Forest ecosystem are essential and plant species and plant and hence of wild genetic resources. Unplanned clearance or conservation of these forest leads to loss of entire species and their potentially useful genetic variation.

These forests can be conserved only if the human pressures on them are reduced and their use is guided by continuous careful management. The forces responsible for forest destruction are complex but the most urgent issue is the relationship between forest and the people living in or around them.

Local population is the principal agents of destruction but they are only responding to outside pressures. Force or legal compulsion does not appear to be the answer. The solution appears

to be in working with the local people and responding to their needs as well as to those of conservation. Forest cannot survive as Conservation Island amid seas of hungry people.

Forest provides a wide range of locally used goods and services. The value of these must be included in forest management plans and share of economic benefits passed back to the local communities through improved availability of goods and services from the forests. These include job creation, investment and expanded social benefits.

- The need to preserve biodiversity is self evident conservation issue than polluted beaches, burning forest or expanding deserts. But it is as critical, if not more so. Conserving agriculture biodiversity is essential for long term food security. Because wild plants are genetic sources of resistance to disease, drought, and salination.
- Biodiversity is not only important for agriculture, plants based medicine provides more than 3 billion people with their primary health care and comprise a multi-billion dollar a year industry. But as scientific and commercial awareness of the value of plant base medicines grow, the plants are coming under increasing threats.
- According to a recent survey of nearly a quarter of a million plant species, one in every eight is at the risk of extinction. The survival of 25% of the world mammal species and 11% of the bird species is also threatened. As long as deforestation, land and water degradation and monoculture cropping continue to increase the threats to biodiversity will continue to grow.

The strategy being adopted for the conservation of forest ecosystem involves;

- a. The improving and expansion of forest management for sustainable production
- b. The protection of special areas for wild life ecosystem and genetic resource value, and
- c. Ensuring partnership with the people.

Under the strategies the following measures are being adopted.

- 1) Expansion of research silviculture.
- 2) Provision of professional and technical training.
- 3) Development of professional and technical training.
- 4) National conservation strategies.
- 5) Integration of protected areas into national land use planning.
- 6) Management of protected and adjacent areas for contribution to rural development.
- 7) Research on species of potential economic value
- 8) Development of conservation.
- 9) Increasing awareness of value of genetic conservation

The ministry of Lands, and Forestry and Mines is mandated is to ensure the sustainable management and utilization of the nation's lands, forest, wildlife resources as well as the efficient management of mineral resources for the country's socio-economic growth and development. In carrying out this mandate, MLFM aims at achieving the following goals;

- Wealth creation
- Revenue mobilization

- Employment generation and
- Environmental sustainability

Sector Agencies

Presently, the lands Sector is made up of the following agencies:

- a. Lands Commission (LC)
- b. Land Valuation Board (LVB)
- c. Land Title Registry (LTR)
- d. Survey Department (SD)
- e. Office of the Administrator of Stool Lands (OASL)

However, institutional reforms that the Ministry is currently pursuing seek to merge all these agencies into a one-stop shop to cooperate organizations soon.

The forestry Sector agencies have since 1999 been successfully merged into the Forestry Commission with the following divisions;

- a. Forest services Division(FSD)
- b. Wildlife Division
- c. Timber Industry Development Division (TIDD)

The mines sector agencies are:

- a. Minerals commission
- b. Geological Survey Department
- c. Previous Mineral Marketing Company Limited (PMMC).

Collaborating Ministers and Other Stakeholders

MLFM collaborates with other key ministers. Among them include

Minister of local government, Rural Development & Environment; Water Resources Works and housing, Food And Agriculture, energy and Finance & Economic Planning pursuant of its mandate.

Stakeholders which are actively involved in the implementation of sector projects include;

- Traditional Authorities
- Ghana Chamber of mines
- Ghana Timber Millers Organization (GTMO)
- Ghana Timber Association (GTA)
- Furniture and Woodworkers Association of Ghana (FAWAG)
- Academic and research Institutions And
- Civil societies including NGOs

THE LANDS SUB-SECTOR

Situation As at Year 2001

As at the beginning of year 2001, there were various challenges facing the lands sub- sector which includes the following;

- Fragmented land Sector Agencies (LSAs) with entrenched identities and interests performing overlapping and duplicating functions
- There were 166 land Laws and Regulations, some of which were conflicting, and/or inconsistent with new policy directives of Government;
- Land Information Management regime was mostly manual comprising of graphical maps cadastral data and textural records without any systematic linkages thus made records accessibility a very lengthy task
- It took more than three(3) years with high cost to register a title to land as there were only two (2) Deed Registries nationwide located in Accra and Kumasi.
- About 35,000 backlog cases at the formal courts concerning litigation over ownership of land.

Policy Intervention & Strategies (Lands)

IN order to address the problems facing land administration in the country, MLFM instituted measures to streamline policies and legislative frame work and establish an efficient and cost effective one stop corporate organization to handle land management in order to reduce time and cost of land registration and titling.

Current Challenges Lands

One major challenge that the Ministry faces the ongoing reforms in land administration is how to ensure the sustainability of the customary Land Secretariats (CLS) being established. Presently the CLS are being supported by Government and other development partners through the land Administration Project. However the question is whether the traditional authorities managing these secretariats would continue to financially support them when the Land Administration project comes to a close.

Way Forward (Lands)

The success of land administration in the country depends largely on an effective administrative set up at the local level. For this reason the Ministry would conduct a study and come up with recommendations for effective and effect and sustain management of the Customary Land Secetariat now being established

THE FOREST AND WILDLIFE SUB SECTOR

Situation as at 2001

The problem with the forest and Wildlife sub-sector as at 2001 was also gloomy. The resource base and revenue generation of the sub-sector were dwindling as a result of the factors

- Discretionary allocation of timber rights
- Inadequate capacity of the Forestry Commission (FC) to enforce forest laws and regulations
- Lack of momentum to carry out institutional reforms of FC
- Increased incidence of illegal timber operations
- Dwindling stock of traditional wood species for export
- Deforestation (due to farming, fuelwood harvesting illegal logging and wildfires)
- Inadequate forest plantations development to non-existence of a technical department within FC responsible for plantation development
- Inaccessibility to degraded but fertile forest lands for agro-forestry purposes
- Neglect of Bamboo as a useful wood resource and viable alternative to traditional timber species
- Lack of promotion of ecotourism strategy with wildlife subsector

Strategies and Policy Interventions (Forest & Wildlife)

In addressing the problems facing the forest and wildlife sub-sector, the Ministry adopted the following strategies;

- Policy reviews on allocation of timber rights through a Competitive Bidding process to ensure fairness, equity transparency and prevent substantial loss of revenue to the state.
- Development of cooperative customer focus and business oriented organization located in a common building to facilitate needed team work for improve service delivery
- Implementation of a Voluntary Partnership Agreement (VPA) with European Union on legal timber to ensure legality in timber export trade.
- Implementation of a various plantation development programme through a number of strategies namely Modified Taungya System (MTS), Community Forestry Management Project (CFMP), private Commercial Plantation Development and Forestry Commission Initiative to reduce poverty, encourage employment generation and restore loss of forest cover.
- Institution of a benefit-sharing scheme for parties involved in plantation development to make it economically attractive to both local and foreign investment

- Implementation of a wildlife Management Project to address the menace of wildfire in the Transitional Zone of the country
- Promotion of eco-tourism focusing on public-private sector partnership in wildlife resources development
- Promotion of the use of bamboo as a useful alternative wood resource to reduce the pressure on the traditional exploited wood species

Progress (Forest and Wildlife)

These are the highlight on the achievement in the forest and wildlife sub-sector.

- The Ministry since 2001 has introduced competitive bidding as process of raw material allocation to processing mills. This process is more transparent and efficient in the allocation of timber resources, using price as determinant factor. It also enhances the economic value of the resource and promotes its prudent usage and protection.
- **The ministry is implementing a Validation of Legal Timber Scheme to monitor logging and wood processing activities. The strategy behind this initiative is to introduce a certification scheme to ensure that only legal timber enters the European Union through Voluntary Partnerships Agreement (VPA) with Ghana.** This process will prevent illegal logging and loss of revenue to government control wastage and prevent overexploitation of timber resource
- **To address** the rapid deforestation, the Ministry is implementing various forms of forest plantation programmes with communities and private sector under the newly established Plantation Department within the Forest Services Division. To date an area of over 107,000 ha have been planted. This programme employs about 46000 fulltime and approximately 1.1 million workers as part-time
- The modified Taungya System of plantation development has made temporal available fertile and productive agricultural lands within degraded forest reserves to farmers to boost food production. Food production from such areas for the year 2006 yielded 23,000 metric tons of Maize and 850,000 of Plantation
- Furthermore Cabinet has improved a benefit- sharing scheme for parties involved in Modified Taungya System (FC-40%, Farmer -40%, Land owner-15%, local community-5%)
- The attorney General is considering for approval , a reviewed benefit- sharing scheme for parties involved on Commercial Plantation Development

- To ensure effective community involvement in resource management and protection , the Ministry through various projects has instituted livelihood schemes that has benefited over 1,000 people within forest fringe communities. An amount of over ₵25 billion has been disbursed so far to individuals in the beneficiary communities for this purpose.
- The extensive promotion of the use of bamboo and rattan as substitutes for timber has yielded positive results. Now more people are using these raw materials in the manufacture of furniture and other wood products.
- Tourism concession agreement has been negotiated with private investors for management for management of Mole and Kakum National Parks to Promote ecotourism.
- For the first time in the history of Ghana, the Ministry in collaboration with its stake holders has developed a national Wildfire policy which was launched in February 2007. It is envisaged that this current policy would enable us to manage wildfires effectively.

MINING SECTOR

Situation As at 2001

The situation of the mining sub-sector as at 2001 was not different from the other two sectors already highlighted. There were problems limiting efficient mining operations such as:

- Over-reliance on few traditional minerals (gold, Diamond, Manganese and Bauxite)
- Outmoded Legal and Fiscal regimes
- Hostile relationship between mining companies and host communities
- Environmental degradation (Mercury Pollution Of Water bodies)

Strategies and Policy Interventions (mines)

In dealing with the problems the ministry adopted the following strategies:

- * **Development of new mining policy and review of legal and fiscal regimes to attract more investments in the mining sector**

- * **Implementation of forty Million Euros(€ 40 Million) European Union supported (Grant) mining sector programme to uptake the following projects:**
 - **Institutional reinforcement and capacity building**
 - **Development of geological data including airborne geophysical survey of the entire Voltaian Basin for mineral and other resources**
 - **Conducting a Mining Environmental Impact Assessment to measure the effects of large scale mining operations and future consequences of mine closure throughout the country in order to find appropriate solutions**
 - **Abatement of mercury pollution resulting from Small Scale Mining**
 - **Upgrading mining infrastructure in the Western Region**
 - **Information Management system to link the various sector agencies to facilitate information sharing**
 - **Implementation of alternative Livelihood Projects (ALP) in mining communities to improve relationship between mining companies and their host communities.**

Natural resources such as mountains in the world are recognized by the world conservation union. Various mountain forests in the world have their peculiar characteristics and challenges in terms of management. However, some challenges are common hence, can be replicated for others after they have been studied and understood properly.

Again, this is due to the nature of the mountain, documentation is limited. Notwithstanding, all necessary- areas touching presentation covers and shows the relevance of the paper title.

Governmental agencies, relevant personnel, elders of the community with history related non-governmental organizations (NGOs) and other related books were consulted.

Conclusion

Although the Government of Ghana has seen great improvement over the years, there is still more room for improvement. It is therefore imperative to continue addressing the various challenges identified for the benefit of the country and the world over.

