

# The linkages between Biodiversity Conservation, Ecosystem Services, and Community Development in Tropical Region: A Review

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## Abstract

Most of communities depend on natural resources such as forests, land, and water for their livelihoods. Nature is the source of human health due to daily needs from ecosystem goods and services. From the relationship existing in ecological and economic systems, the aspects like improved living standards of people, livelihoods, biodiversity conservation, and human wellbeing require a multi-disciplinary collaboration between communities and stakeholders to find a good approach that integrates biodiversity conservation and human wellbeing. We are interested to know the status of community based conservation projects in the tropical region and bring the scientific contribution referring to the findings. We reviewed existing documentation on community conservation and compiled the similarities of conservation practices that involve local communities. We did a comparative study in some countries that are located in tropical region. The data show that in all mentioned countries, there is a will to integrate biodiversity conservation and community development but there is a need to improve the policies and regulations and increase the investment in community development projects. We also detected the issue of lack of conservation professionals in the decision making and this causes the reluctance in implementing community conservation projects in some countries in the tropical region. The assessment of the contribution of community conservation projects on improved livelihoods, and sustainable biodiversity conservation in and around the protected areas will help to improve community conservation. There is a need to assess the perceptions of local community towards co-management in biodiversity conservation, and ecosystem services in and around the protected areas in tropical regions.

**Keywords:** Natural Resources; Revenue sharing; Livelihoods; Sustainable Development; Investment

## Introduction

The tropical region dominated by tropical forests is the worldwide richest ecosystem in biodiversity (Gibson, 2011) and covers around 19.6 million of Sq km of the Earth's surface (Pimm and Sugden, 1994). It is the home habitat of around 75% of all world's endemic plants and animal species (Newman, 2002), and contains around a half of planetary living animal and plant species (Terbough, 1992). Besides their dominant recognition in maintaining and sustaining biodiversity, tropical forests support cultural diversity of indigenous people and provide an array of valuable ecosystem services such as carbon storing, controlling soil erosions, and reducing downstream flooding (Bradshaw et al., 2007).

High pressure on tropical forest was mainly observed in Latin America, South-East Asia and in some African countries (FAO, 2005), where a half of wetlands was lost since 1900 (Ross, 2008) and about 20% of its mangrove forests was lost between 1980 and 2005 (FAO, 2005). Human activities fostered the habitat degradation in tropical forests (Laurence and Peres, 2006; Laurence et al., 2012) through logging (Curran et al., 2004), ecosystem destruction, unsustainable hunting (Robinson and Bennet, 2000), fire (Barlow and Peres, 2004), deforestation (Richard et al., 2008), invasive species (Loope et al., 2001), and global climate change (Parmesan, 2003). Consequently, changes in these ecosystems impacted the species diversity, abundance, and genetic variety (Antonio et al., 2011).

A considerable number of amphibians had undergone the extinction (CBD, 2004) while around 20% of the world's coral reefs have been destroyed (Muir et al, 2007). The abundance of vertebrate species was reduced by nearly one-third on average between 1970 and 2006, and severe declines in freshwater species (CBD, 2004) as well as terrestrial species abundance (Butchart et al., 2011) were observed including colobus monkeys (Oates et al., 2000), great apes (Campbell et al., 2008; Greengrass, 2009), and ungulates (Brashares et al., 2001). Around 30% of fishes have been seriously damaged by destructive fishing practices, pollution, disease, coral bleaching, invasive alien species and unsustainable tourism (Wilkinson 2008).

Recent projections on the pressure of anthropogenic activities on ecosystems indicated continuing rates of species extinction, loss of natural habitats, and changes in species richness and abundance and biomes (CBD 2004). Consequently, the ecosystem functioning is negatively impacted by these changes such as provision of clean water (Hughes and Petchey, 2001), climate regulation (Ruiz and Potvin, 2011), supports for agriculture such as availing food by improved soil and land fertility, controlled agriculture from pests and diseases, seed dispersal and pollination services (TEEB, 2010), and hence impacts economic expansion, human health and wellbeing (Laurence, 1999; Sodhi et al., 2007).

To address these challenges, conservation strategies including creation of new protected areas, enlargement of current protected areas, creation of buffer zones and corridors, and empowering local communities through conservation projects were put in place. In order to safeguard tropical forests, protected areas were created across the tropics (Jankins and Joppa, 2009), and are central to conservation strategies for fauna and flora, whilst benefitting neighboring human communities (Rodrigues et al., 2004; De Fries et al., 2005; Hayes, 2006;). Nevertheless, the pressure on protected areas continues despite legal protected status (Abernethy et al., 2013). Most of the changes are brought by deforestation in tropical forests, land modification, improved and developed agriculture and urbanization (Lambin et al., 2001). This impacted severely on key species, especially the taxa with large body sizes, slow reproductive rates, and little adaptability (DiMarco et al., 2014). Many wildlife populations continue to decline and local extinctions become increasingly common (Craigie, et al., 2010).

Community based conservation (CBC) schemes and integrated conservation development projects (ICDPs) involving the participation or compensation of local people became popular in different countries as a response to reduce poverty and unemployment. Their main purpose is to improve human wellbeing around protected areas (McShane et al., 2011), and probably reduce their dependence on forest resources, which consequently reduce the rate of biodiversity threats. In this review, we document and analyze the linkage between biodiversity conservation, ecosystem services and human wellbeing based on what has been observed in tropical areas.

### ***Community based conservation (CBC) schemes and integrated conservation enhancement***

Community based conservation (CBC) schemes and integrated conservation development projects (ICDPs) take origin in community conservation (CC), considered as a mean for reconciling improved community livelihood and biodiversity conservation around protected areas by ensuring that the interests and knowledge for people were taken into account (Adams and Hutton, 2007). Community conservation embraces a range of initiatives such as public outreach, community development projects and community engagement in conservation projects (ICDP), CBC, and community engagement in natural resources management. ICDP approaches considered poverty of communities neighboring protected areas as the major obstacle for conservation and hence improving living conditions was assumed to be the main solution, and addressing both conservation and development was considered as a win-win solution to reduce the pressure of local people on protected areas (Hughes and Petchey, 2001).

Many countries adopted CBCs and ICDPs for poverty alleviation and hence a positive socio-cultural and environmental protection (Ashley, 2001). Different community conservation ways were applied. The examples include provision of funds to households with poor living conditions, conservation trainings, infrastructure development such as roads, schools, hospitals, water availability, formation of cooperatives, handcrafts development, revenue sharing from ecotourism, and creation of jobs (Orjala, 2006). Other interesting perspectives focused on the increase of the awareness, and psychological empowerment in order to increase self-esteem and pride for cultural and natural heritage, as well as political empowerment through the creation of a forum for the expression of local people around protected areas (Schetvens, 2000).

### ***Ecosystem benefits and community development***

The rural households get most of their income, goods and services from ecosystem services (Prager et al., 2005) and about three quarters of more than one billion people who own less than one dollar a day are found in rural settlements (Prager et al., 2005). Most of the people derive their living resources on a wide range of natural products and benefits from ecosystem goods and services and consequently their well-being is negatively impacted when biodiversity is disturbed (Duraiappah et al., 2005). Consequently, people without alternative mode of life suffer from biodiversity loss, they lose biological insurance (Sukhdev et al., 2015).

According to the Millennium Ecosystem Assessment (MEA, 2005), 60% of the most used ecosystem services are disturbed and used unsustainably, bringing an implication on community development, poverty alleviation which needs strategic approaches for the societies to adopt and address the long-term environmental changes (Haines-young, 2015). When the human well being is not improved, this results in biodiversity loss because the dependence on natural resources becomes high. We need to address the issue of poverty to ensure sustainable biodiversity conservation. (Díaz et al., 2006).

### ***Linkage between local communities, ecosystem benefits and biodiversity conservation***

Different approaches are required for managing and restoring sustainably biodiversity and ecosystems and these approaches would direct the sustainable management and policy development towards human development (Duraiappah et al., 2005). These approaches should seek to inter-relate environment management, biodiversity and human life (CBD, 2004). Biodiversity conservation and communities' needs must be integrated for sustainable economic development, and the approaches for ecosystem management form a basis for sustainable services benefiting to the people and enhance co-management of biodiversity and ecosystems (CBD, 2004). The policymakers and managers should consider the societal perceptions and their decisions have to be based on people's choice but depending on ecosystem approach, those decisions should emphasize on communities' knowledge on biophysical limits that hinder the ecological process and spatial interaction at which they operate. Depending on existing relationship between biodiversity and ecosystem function with their implications on conservation debate; it is a responsibility of everyone to conserve biodiversity because we all depend on ecosystem services for us to be healthy and perform our daily activities (Duraiappah et al., 2005).

Crucially, it is known that the ecosystem benefits and outputs are based on high range of indigenous species (CBD, 2004) and the decisions about biodiversity and ecosystem services should be based on socio-economic context (FAO, 2005). Hence, the linkage of

people's insight on the work of ecosystems to widen the understandings on how people benefit from nature's services and what can be done to sustain and improve their wellbeing (CBD, 2004). These results in a rethought of the most basic concepts and accept that rural people depend on natural resources such as forests, land, and water for their livelihoods (FAO, 2005). The linkages between socio-economic and ecological systems, the ideas like development, poverty reduction, livelihoods, human wellbeing, and biodiversity conservation need to be addressed through multi-disciplinary collaboration and addressing these systems require input from social, natural scientists, decision makers, policy makers and practitioners (Baroang et al., 2005).

### **The relation between ecotourism, CBCs, and ICDPs for sustainable biodiversity Conservation**

Always, it is good to create a win-win approach in conservation to be successful. The ecotourism project practices influenced many people to think on CBCs and ICDPs because of the funds paid by people who visit the ecosystems. It is clear that protected areas contribute to development through tourism industry enhancement which bring special benefits to the local communities and generate sustainable local benefits (Goodwin et al., 1996). Ecotourism in around 1980s was explained as direct special rewards to the world's conservancies and ecological practitioners who always show their deep engagement in sustainable environmental and ecological management practices. Ecotourism can be defined as moving in and around a well-protected and managed natural habitat with specific interests such as entertainment and recreation, biodiversity or environment study Ceballos-Lascurain (1996).

The CBCs and ICDPs rely on funds from ecotourism and involve local communities in decision-making and they choose what is comfortable with them. When CBCs and ICDPs are well planned and implemented, the people who were used to threaten the protected areas become the protectors. The beekeeping, handcraft projects, construction of schools, and health centers around the protected areas have created jobs for local people and have helped them to have access to education and health care. However, there is a gap in sustainability, monitoring and evaluation to ensure the effectiveness and efficiency of those programs (WTO, 2006a).

The ecotourism is based on maintenance of special and attractive natural landscape rich in flora and fauna and then support people for earning money from ecotourism through provision of incentives for conservation and develop alternative solution to reduce pressure on natural reserves (Salafsky, 2001).

Ecotourism has expanded with different incorporated ideas from different responsible practitioners, environmentally friendly destination management, and sustainable development of local human populations (Torquebiau and Taylor, 2009). Different authors argued that ecotourism should be done in a way that sustains the environment as it is a home to many worlds' rare and threatened species (Brooks et al., 2006).

The existence of interrelation between biodiversity conservation and ecotourism development can be of crucial importance as they benefit each other by supporting one another for their sustainable goals (Boo 1992; Ceballos-Lascurain 1996). Community based ecotourism (CBET) can be taken as one way of biodiversity conservation. Despite this, it also reduces threats on biodiversity such as land degradation, illegal plants and animal harvesting and stops people from killing wildlife that raid their crops (Kiss, 2004).

This is significant to the employment provision, economic growth and foreign exchange. It is estimated that tourism is contributing to more than 75 million direct jobs around the world for the communities and this include direct jobs, and indirect jobs which induces employment opportunities to the communities and this has also enhanced women empowerment (UNWTO, 2012).

The existence of different meanings of sustainable tourism that are referred to the touristic activities respect and conserve a location's economy, environmental, and social balances. Sustainable tourism refers to the tourism that meets the needs of the present tourists and host regions while protecting and enhancing opportunities for the future (WTO, 1999).

The sustainable tourism concept is informative in the sense that tourists learn about the destination and how to help sustain conservation while deepening their own travel experiences. The people learn that the ordinary and familiar means of life may be of interest and value to foreigners and it is supportive of the integrity of the place and is beneficial to local residents and the conservation of resource, respects local culture and tradition, and strives for quality. Hence the use of all the means for guidelines and criteria to

reduce environmental impacts through benchmarks and improvement of tourism contribution to the sustainable development and environmental conservation and the only way to enhance sustainable tourism requires enhanced cooperation and concrete partnerships among tourism actors that include industry, government at all levels, local communities, protected areas managers and planners, and the tourists themselves (Eagles et al., 2002).

The Ecotourism cannot be successful without consistency in conservation. Community based conservation has a meaning because of the availability of the natural resources. The variables of Ecotourism, CBCs, and ICDPs are interconnected because one depends on another. This relationship includes humans as we are on the forefront to manage all those resources. It is understandable that we all have to be accountable to conserve biodiversity because when we will have healthy ecosystems and human capital, we will for sure have healthy people to sustain the management of the natural resources.

### **Comparative studies**

For most of the cases, in different countries poor conservation, intrusive resource management strategies and planned development have forced policy makers and scholars to reconsider the role of community in resource use and conservation through Community Based Conservation. In some decades ago, it was hard to change the mindsets of people and engage them in biodiversity conservation but because of education programs that were decentralized, people have started to understand their role in biodiversity conservation. (Chambers and McBeth, 1992; Chitere, 1994; Etzioni, 1996).

To achieve this, there are direct enormous sums of money and effort invested toward community-based conservation and resource management programs and policies (Arnold, 1990; Clugston and Rogers, 1995; Dei, 1992; Douglass, 1992; Perry and Dixon, 1986; Raju, Vaghela and Raju, 1993; Robinson, 1995). In addition to that empirical and historical works that have helped resurrect community and local participation in conservation, a choice-theoretic foundation for the role of community in conservation has become available as well. The researches have shown communities to be successful and sustainable alternatives to state and private sector in the management of resources (Berkes, 1989; Bromley, 1992; McCay and Acheson, 1989; McKean, 1992; Ostrom, 1990, 1992; Peters, 1994; Wade, 1987).

Different decision makers suggested that if communities are involved in conservation, the benefits they receive will create incentives for them to become good stewards of resources. This vision of community engagement as the centerpiece of conservation and resource management is attractive. It permits the easy contestation of dominant narratives that favor state control or privatization of resources and their management (Li, 1996). From there, there is a need of such negotiations to advocate long-term goal of increasing the role of community in natural resource management (Li, 1996). The Community Based-Conservation concepts were taken in consideration through different countries regarding the existing challenges in conservation and environmental hazards.

### **Rwanda**

In Rwanda, tourism revenue sharing was ever known in the 1950s during the Belgian colonialists who used the revenues for ensuring cooperation from indigenous Rwandans that were living in areas around the country's game reserves (RDB, 2012). During this period, the money was given to the local communities and they received the direct share of meat from wild animals and this was limited by the game departments as they wanted people to understand that they have to be accountable to protect the biodiversity (Naughton- Treves, 1999). Since 1996, political stability and strong conservation policies in Rwanda were strong and maintained. And over the last ten years, tourism industry development was identified as having significant growth potential with great contribution in high growth rate of the country's GDP (Mwandosya, 2007). The strong collaboration of the government, institutions and private sectors has resulted from the joint efforts in promoting the tourism industry and this is serving as the country's key drivers of economy and marketing the country as the quality nature destination, the industry's contribution to national output (GDP) has shown a steady increase from 0.5% in 1995 to 17.2% in 2010 (RDB, 2012).

Through outreach programme in Rwanda, for the Tourism Revenue-Sharing (TRS) programs, Rwanda Development Board (RDB) usually distributes 5% of the amount of revenue earned from tourism to assist local community's development around the national

parks in the construction of infrastructures such as schools, dispensaries, and water supply, among others (Archabald and Naughton-Treves, 2001). TRS programs promote tourism development and ensure that local communities enjoy tangible benefits from the industry while participating in wildlife conservation (Archabald and Naughton-Treves, 2001). The Rwanda Development Board has established the Revenue Sharing Scheme to create a win-win approach in protected areas conservation and management. Through this scheme, RwF 1,133,195,986 has been invested in 152 Community Based Conservation Projects (CBCs) and Integrated Conservation and Development Projects (ICDPs). However, there is still a problem of how local communities are involved and there is a need to improve the approach used because the effort hasn't yet had major impact in terms of socio-economic development. The amount of revenues shared with local communities is still at low level in Rwanda when you compare to Uganda and some South African Countries. There is also an issue of corruption at local administrative entities when distributing funds to the beneficiaries and many funded projects are no longer on ground.

### **South African Countries**

The CBCs can be defined and implemented according to the conservation policies in the countries. Due to different biodiversity programs and situations in many countries the concept used in relation to CBCs can vary from one country to another. In Zambia, they mostly use the concepts of Community Based Natural Resources Management, Community Based Forest Management, and Community Based Wildlife Management to show how biodiversity conservation and ecosystem services are linked to community development (Li, 2002).

The general failure of the centralized approach to natural resource management to arrest irretrievable losses of biodiversity in the South African Countries including Zambia, Zimbabwe, Botswana, and South Africa during colonial and post independent periods led to a search for an alternative natural resource management (NRM) regime. For such an approach to be widely accepted and adopted it had to be capable of addressing ecological, social and economic concerns. The concept of community-based natural resource management (CBNRM) arose specifically to address the goals of environmental, economic and social justice. CBNRM, which integrates wildlife conservation and rural development objectives in a single program package, has been adopted as a win-win approach to wildlife management in South Africa, Zimbabwe, Botswana, Swaziland, Zambia, and Mozambique (Getz, et.al, 1999).

CBNRM attempts to reverse resource degradation and thus at least begin to counteract the long history of impoverishment, political-economic subordination and disenfranchisement of traditional resource users (villagers). In other words, community-based wildlife management (CBWM) emphasizes on benefits to natural resource dependent communities and/or pursuers of subsistence livelihoods that are closely dependant on wildlife management (Lynch and Talbott, 1995 quoted in Li, 2002).

The community-based wildlife management strategy as a policy tool recognizes that local communities could be motivated to adopt benign and sustainable wildlife management practices. It is based on the assumption that local communities are interested and willing to adopt and implement wildlife conservation programs as long as they are legally entitled to any resultant ownership of resources and to associate benefits. In view of these benefits, CBNRM emphasizes social fencing as a mechanism for conserving the natural resource in question and perpetuating the flow of benefits associated with it (Li, 2002).

For example, game is traditionally an important source of protein to local communities. If properly managed, targeting smaller mammals as a protein source at subsistence level is unlikely to cause depletion of wildlife stock. However, subsistence hunting as urged by Jachmann (1998) and in more general terms by Baland and Platteau (1996) can have adverse impacts on wildlife population.

There are a number of obvious simplifications in the assumptions, design and implementation of CBWM waiting to be addressed. In fact, some CBWM assumptions are actually flawed (Leach et al, 1999). Failure and success of CBWM stems not from weaknesses in program assumptions alone but from the real priorities of some stakeholders. While, some interest groups are indeed genuine in their participation in CBWM many others have lopsided objectives predicated by their political aspirations or environmental conservation priorities that may or may not be congruent to the needs, belief and expectations of local communities. The approach used in community conservation programs is almost the same in all mentioned South African Countries and the ecosystem composition, function,

and structure is almost the same. There is a need of consistency in those CBCs approaches used in the South African region and always the political will and bottom up policies are helpful to succeed in community conservation. The challenge in this area is the cultural behavior of hunting and many hunters are illegal. The wildlife trafficking is a big issue where some government officials are behind that illegal trade.

### ***Uganda***

Like many other countries of Africa, Uganda, located in Albertine rift, faced different conflicts between local people and protected areas. The Uganda National Parks (UNP) was created in November 1995 to solve this problem and has implemented a revenue sharing scheme with people adjacent to national parks. The Uganda Wildlife Act of 1996 and the Uganda Wildlife Authority (UWA) have legally ordered to give 20% of its park entry fees to the local communities surrounding the protected area where it was collected. This was based on the acknowledgment that communities around the protected areas endure a contribution to reduce costs associated with the conservation of protected areas, and yet the benefits they gain are minimal (UWA, 2000).

This was to motivate and encourage communities around the protected areas to join community-based conservation and raise their understanding on their benefits from conservation which help them to improve their livelihood, welfare and living conditions. The specific objectives of revenue sharing were to provide clear understanding and create proper relationship between protected areas with surrounding adjacent communities, to highlight the benefits of protected areas to the surrounding people, and to solicit support and acceptance of protected areas and conservation from adjacent communities (UWA, 2000).

This also ensures their involvement in partnership with the wildlife managers and local leaders for better natural resources management and its sustainable use in and around protected areas. With this goal and the objectives in mind in 2000, UWA has implemented guidelines for its revenue sharing programme. They explained the goals and objectives for revenue sharing, strategies for its implementation, roles and responsibilities of various parties, established procedures for selecting projects and where they would be located, the approach for disbursement of funds, as well as the monitoring and evaluation mechanisms (UWA, 2005).

The guiding principles of the UWA revenue sharing programme was basically the geographic focus of the programme in the communities bearing the brunt of the conservation related costs for protected areas. UWA decided to partner with the surrounding communities around the protected areas to ensure the efficiency and effectiveness of their management. The people were significantly engaged in Uganda wildlife management as the Authority in charge found high potentials in establishing the community based conservation approach (UWA, 2005). The prescribed strategies for UWA revenue sharing programme implementation include collaboration with local government institutions, building the capacity of adjacent communities, developing a working relationship with local communities, establishing guidelines and procedures for the programme's implementation, managing the programme funds and accounts in collaboration with local government partners, monitoring the use of the programme's funds and evaluating its impacts (UWA, 2005). The challenge of community conservation in Uganda is the cultural behaviors and low mindsets of some people who are still poaching. Also corruption has affected the effectiveness of the community conservation programs therefore some local communities are still poor and depend highly on biodiversity resources.

### ***Democratic Republic of Congo***

The Democratic Republic of Congo (DRC) has many ecosystems but the community-based conservation is not well set in the country and this affects the wildlife and tourism industry. Many international organizations expressed their will to support conservation efforts in Democratic Republic of Congo but the security issues in so many forests in DRC challenged them (Molenge, 2014).

Through a USAID supported partnership the Jane Goodall Institute (JGI) has collaborated with Conservation International (CI) and the Dian Fossey Gorilla Fund International (DFGFI) in the design and implementation of a community-centered conservation (CCC) program in the Maiko-Tayna-KahuziBiega Landscape of eastern DRC. The DRC-CCC Program is designed to complement DFGFI's conservation and community mobilization work and to take advantage of JGI's unique model of community-centered conservation which

links sustainable development activities in household livelihood, health, family planning prioritized by the community as part of their work to conserve and sustainably manage natural resources (USAID, 2015).

In a 7.4 million-acre conservation corridor stretching from Maiko National Park and the Tayna Gorilla Reserve to Kahuzi-Biega National Park reside an estimated 5,000 eastern lowland gorillas and 15,000 chimpanzees. Despite its high ecological and biodiversity value, this region is experiencing a severe conservation crisis due to agricultural/pastoral expansion, high levels of subsistence hunting, bushmeat extraction, exotic animal trade, extensive gold, coltan and other mining. The uncontrolled exploitation of the resources in this region is driven by socio-economic depression resulting from more than a decade of civil war (USAID, 2015).

Collaborating with the partners mentioned above as well as other local civil society and government stakeholder groups, JGI organizes and helps to implement community-centered conservation initiatives modeled after JGI's TACARE (Lake Tanganyika Catchment Reforestation and Education) Project, which supports socio-economic development and sustainable natural resource management in western Tanzania. The DRC program improves health care, provides family planning training and methods, and supports local people in the development of sustainable and more efficient agricultural and livestock practices that contribute to economic growth. The program also focuses on improving local governance, empowering communities, and the use of information technology to support sustainable practices (Molenge, 2014).

### **Tanzania**

Tanzania has the second highest proportion of national protected areas among the Basin states, after Zambia, with 28 per cent of the country set aside for national parks, conservation areas, game reserves, and controlled and protected areas. The Tanzania National Parks (TANAPA) initiated the Serengeti Regional Conservation Strategy in 1985 to ensure community based conservation. They realized that the intuitional framework is necessary to implement the Community Conservation Practices (CCP). They initiated the Community Conservation Co-ordination Committees (C4) in 1991 to ensure collaboration, coordination, communication, competence, and partnership (C4P) around the National Parks (MEA, 2005).

Poaching is still a problem in Tanzania but the programs of involving local communities in biodiversity conservation were strengthened (WTO, 1999). To ensure protected area management, tourism development sustainability in Zanzibar was taken as the priority through sharing of tourism revenues (Watkin, 2003) and this is the main form of tourism across the country and bases on active conservation of natural and cultural heritages including local and indigenous communities in its planning, development, operations and benefit sharing (WTO, 1999).

While the traditional system of reserve the administration in Zanzibar has been using the revenue from protected areas for general economic development, and thereafter, the advocacy has been made to share some tourism revenues for management and community development. As a result, awareness towards biodiversity conservation and wildlife conservation was increased in local people (WTO,1999). In Tanzania they believe that CBC are win-win solutions and that are equal to decentralization because the communities adjacent to the national Parks find easily the revenues from the Parks and are highly motivated to conserve them (Balduis R.D, et al, 2001).

### **Community development measurement approaches**

Measuring outcomes remains a challenge for many community development organizations. A widely held belief among development practitioners is that each community has unique goals, so progress is difficult to measure using only one scale (Blanke and Walzer, 2013).

Most of the time, economic development has a more clearly defined set of goals including employment and income growth and these are indicators of community development even though it depends on the country (MEA, 2005). Even if community development advances the goals of economic development (Blakely and Leigh, 2010), it also needs to empower communities for their basic requirements (Archabald and Naughton-Treves, 2001). Many social scientists have defined development in different perspectives and there



will be other definitions according to the change in developmental processes all over the World (Hoffer and Levy, 2010).

According to Blanke and Walzer (2013), the root of the evaluation problem is due to the lack of specific definition of community development. They suggested that community development success be measured in terms of poor citizens gaining the skills and confidence required to overcome social barriers to economic success, and community institutions making policy decisions and resource commitments that help sustain such success-seeking behavior (MEA, 2005). Generally, this community development may be defined as means of integrating people into socio-economic development aspects (Hoffer and Levy, 2010).

This definition has also been stated by Blanke and Walzer (2013) as a real framework like human capital, financial capital, natural capital, social capital, produced capital, and capabilities needed to maintain livelihoods. Given the broad definition of community development, two broad strains of thought have emerged as to how outcomes can best be monitored. Different academic disciplines and practitioners highlighted the better means for their economic engagement by allowing them to identify own approach for economic development and intervention (Hoffer and Levy, 2010). Others have proposed a universal, operational model for creating community wealth (Emery and Flora, 2006).

### **Global Significance of Tourism Development, CBCs, and ICDPs**

It is obvious that sustainable tourism has shown to be an effective instrument for the realization of Millenium Development Goals (Frangialli, 2006). It serves as tool for poverty alleviation, sustainable development and provides opportunities to poor communities. It contributes significantly to the nations' Gross National Products (GNP). Tourism sector can reach the production of 4.4% of the total gross domestic product (GDP) and employs around 200 million people (WTO, 1999). It has resulted in increase in tourists per year for the international destination from 1 million in 1950 to 808 million in 2005 and incoming revenue of more than US\$800 billion(WTO, 2006a). Especially in Africa, international tourist arrivals have increased from 28 million to 40 million between 2000 and 2005 with an average growth of 5.6% a year, compared to a worldwide 3.1% a year and has resulted in a doubling of receipts from US\$10.5 billion to US\$21.3 billion (WTO, 2006b).

Tourism, CBCs, and ICDPs contribute to the socio-economic aspects by infrastructure development through roads construction, communication enhancement by telephones, increase in water supply, waste disposal and recycling and sewage treatment (Benavides and Perz-Ducy, 2001). This infrastructure development contributes to the increase in opportunities for community development and profit maximization from tourism sector.

This profit maximization and community development can in turn intervene in sustainable conservation and protected areas management with related natural resources. From this, local communities will grant the value of assets through shared revenues. Tourism industry was taken as non-benefitable economic sector and with less contribution to community development but after it was promoted; it has become one of the world's greatest export industries to develop community and country economy. Despite this, the enhancement of tourism sector through community advancements, transportation and free movement on global market environment, tourism has shown consistent growth with an average annual growth rate of 7% per year (UNWTO, 2012). Globally, tourism has been identified to contribute to the socio-economic development of many countries and improving community livelihood and development through tourism revenues (Binn and Nel, 2002). Tourism has contributed to different perspectives including social perspective by promoting the respect and preservation of the communities' cultures around the world (Global education center, 2005) and promotes social exchange (Simpson, 2008) and from the environmental perspective, tourism has the ability to recover the degraded areas (Ryan et al, 2009).

Economically, tourism, CBCs, and ICDPs create a crucial opportunity for community development through job provision (Lee and Chang, 2008) and tourism industry contributes significantly to the foreign exchange of many nations (Lee and Chang, 2008). Tourism development has generated revenue equivalent to US\$944 billion in 2013(UNWTO, 2013). It is shown that the tourism industry is taken as a lead sector for export that accounts for 30% of the total export service worldwide and nearly 45% in developing countries (UNWTO, 2010). In Rwanda since 1998, tourism has been growing in terms of tourist's arrivals and revenues and tourism industry has

shown to be an important export industry representing 47% of total foreign exchange from the export of goods and services compared with 2% in 1995 (Rwanda Tourism Master Plan, 2009). According to recent statistical data, tourism industry is the number one foreign exchange earner for Rwanda, overtaking agriculture, formerly the country's leading export sector (RDB, 2012) and such data indicate that export from tourism have already exceeded earnings from gold and have nearly tripled the amount the agriculture industry has contributed to Rwanda's economy (UNCTAD, 2013). Statistics stated that in 2012 the tourism industry has employed 250,000 people as compared with 132,000 recorded ten years earlier (NISR, 2013).

Apart from its contribution to community and country socio-economic development, there are some challenges indicated by different people that are undermining the socio-economic development of communities whereby they are giving the idea of community restriction from natural resources. In China, the 1994 regulations on nature reserves banned local residents from quarrying, hunting, mining, and logging in protected areas (Ma, 2013).

This is also the case in Rwanda where residents around the reserves are restricted from resources access while they were accessing freely before conservation policy were introduced to protect natural resources for sustainable development (Roe, 2004). Although communities do not understand the idea of restricting them from resources access it is one of the means to ensure that resources are used sustainably and sustainable use of fragile resources. Some of them can respect this restriction for resources but due to poverty and poor living standards, it is noted that people are forced to claim for resources access and this restriction should be communicated to all and from this, revenues should be shared with local community around the protected areas for satisfying basic needs and as poverty alleviation which will in turn change communities mind set to the understanding of the concepts (Roe, 2004).

Different programs in various protected areas in Africa are aiming at benefiting local communities through developmental projects and most of them are related to benefit-sharing mechanism with local communities especially poor families. Like in Jozani National Park in Zanzibar where 29% of tourist revenue are used in community development projects such as schools, health services, pure water supply and so on (Orjala, 2006).

### **The future of biodiversity and ecosystem services**

If we continue the current development path and maintain today's patterns of resource exploitation, the world is likely to continue to lose biodiversity and many ecosystem services will be further reduced. However, it is difficult to predict the exact rates at which biodiversity and ecosystem change will occur. The MEA analyzed four scenarios for the period 2000-2050. All four scenarios indicate a general increase in provisioning services, achieved primarily through land-use change, but at the cost of further degradation of ecosystems which support, regulate and provide cultural services (MEA, 2005).

Predictions by the OECD suggest that agriculture will continue to be a major source of pressure on biodiversity; they highlight the risk of a business-as-usual scenario that would result in the loss of additional mature forests around the world by 2030: 68% in South Asia, 26% in China, 24% in Africa and about 20% in Eastern Europe, Australia and New Zealand (OECD, 2008).

### **Context of Rwanda: Case of Nyungwe National Park**

The Revenue Sharing Program was put in place to build the socio-economic development of the local community through tourism conducted in Nyungwe National Park. Biodiversity conservation and community development must go hand in hand. The Government of Rwanda has put in place the environmental laws and policies and the wildlife policy to promote the sustainable biodiversity conservation (MINICOM, 2013).

Stakeholder analysis is a crucial element in all community conservation projects. Participatory processes have also been proposed as a way to build the capacity of individuals and groups to respond adaptively to new information and circumstances related to environment and this may enhance the effectiveness of conservation projects to develop community around protected areas (Richards, 2003).

Nyungwe forest reserve was updated as a national park since 2004 and the areas around Nyungwe are among the most populated

in Rwanda (RDB, 2012). The historical background of these communities show that most of them used to deliver their living facilities and needs from the forest natural resources like timber, wild meat, mining, honey and land cultivation and other non-timber forest products like medicinal plants and handcraft materials. After decision that this forest be a national park, there were a restriction to the resources access and community have started claiming loss of income (Namara, 2005).

The government of Rwanda has taken tourism revenue sharing programs as one of the best approach to ensure rural development in terms of poverty alleviation, health promotion and education enhancement. Tourism industry is one of the major sectors in Rwanda, with the highest growth potential and it is largest sector for employment provision and major source of substantial foreign exchange (Richards, 2003). It is through this observation that many people consider tourism industry as the major means through which development of local communities can be achieved (Beeton, 2006).

One approach to enhance this development through tourism is to share revenues with local communities and ensure that their potential role is tapped and maintained through active participation in the industry (Beeton, 2006). It is imperative to note that revenue sharing with these communities is central to the sustainable development of the industry not only because tourism has had a close connection with the local communities, particularly as hosts and guides but also because “the destinations of tourists are communities and it is in the community that tourism happens”(Scheyvens, 2002).

To avoid dissatisfaction and conflict with local communities, RDB ordered to use 10% of the park entry fees every year to fund various community projects for their development. Every district that is adjacent to the boundaries of a protected area such as Nyungwe has a secretary for the environment and natural resources who is designated as a representative on the board that manages tourism revenue.

Research conducted on the revenue sharing in Rwanda has shown that revenue sharing program had improved the quality of life of people living nearby Nyungwe National Park, and particularly, there was an improvement of living standards and sustainable livelihood due to increase in income levels for residents as a result of establishment of various projects and revenue sharing support (Kiss 2004). Unfortunately, threats on resources are still noted within the park.

Different authors have identified the root of the problem in the process establishing the revenue sharing policy. It was found out that beyond getting money and change in livelihood, ecotourism requires that life of local communities adapt themselves to a different regime of wildlife exploitation, which imposes a view of the local life that is not necessarily in agreement with the real livelihoods of the local communities (Lindsey et al., 2005).

A previous study of ecotourism in NNP indicated that the limited involvement of local communities in the park’s conservation and protection is based on a lack of community empowerment through community conservation outreach and unfair tourism revenue sharing projects (Umuziranenge, 2012). In some cases, some people around protected areas deliberately protect biodiversity in order to protect the income generated from ecotourism and draw local labor and capital away from biodiversity unfriendly activities (Wunder, 2000), and when ecotourism benefits are sufficiently high and wide spread to out-compete basic livelihoods (Kiss, 2004).

The upgrading of the forest reserve to national park status increased the restrictions on access to these natural resources leading to substantial loss of income diversification for the communities (Namara 2005). On the other hand, human capital weaknesses restrain the fraction of the community members who participate in the benefits of ecotourism to only those who are semi-skilled in planning, business management, financial management, marketing, and product research and development, while those who are not skilled in this domain are often placed in a poverty trap (Ashley and Jones, 2001).

For making sure that ecotourism is linked to effective conservation; all the Government and non-government organizations, communities, private sector, and all other stakeholders should take time for participating in implementing ecotourism projects leading to a sustainable community development around the protected areas (Sofield and Li, 2007; Zeppel, 2006).

This is achieved through the development of an integrated biodiversity conservation and development projects (ICDPs) in and around NNP through community based eco-tourism (CBET), an approach used to involve local communities to have ownership in natural resources management (Kramer et al., 1997; Oates, 1999; Ferraro and Kiss, 2002; Ferraro and Simpson, 2002;).

This approach is the community based natural resources management (CBNRM) and it is used to effectively involve people in integrated conservation and development projects, which in turn shall bring solutions to the threats facing the biological diversity (Kiss, 2004).

## Conclusion and Recommendations

Looking at these case studies we realized that the similarities in all countries are the political will to engage local communities in biodiversity conservation but the common challenges are the few number of conservationists in decision making, corruption at local administrative entities while distributing funds, idle and unsustainable projects, and human wildlife conflicts that are not well managed. We specifically realized that DRC doesn't have a consistent revenue sharing scheme at national level and that in South African Countries, some government officials participate in wildlife trafficking using local communities in illegal hunting and some deaths and imprisonments affect the local people therefore, this becomes a challenge to community conservation. DRC also has a specific challenge of wars and this has affected many community conservation efforts in this country. There are many countries in tropical region which don't have the policies on CBCs and ICDPs. There are so many threats to the ecosystems through those countries. To reduce the threats to biodiversity, there is a need to create more ecotourism facilities, CBCs, and ICDPs, and other economic opportunities together with good co-management of protected areas for improving livelihoods and food security, reducing reliance on park natural resources. This can contribute a lot to stop illegal activities in the natural ecosystems. This can work if biodiversity conservation, eco-projects, and ecotourism are encouraged and strengthened for providing economic incentives for natural habitats preservation and only when tourism revenues are enough and accessible with the target populations and it can promote the socio-economic development of local communities if used effectively and efficiently. There is a need to improve the revenue sharing program so that it motivates the local communities to protect the parks in tropical regions. Further research activities are needed to assess the perceptions of the people around the protected areas on the role of biodiversity conservation, how the co-management can be improved, and also assess how the conservation projects that have been conducted around the parks have helped people to improve their livelihoods. In addition to that, community outreach for conservation education should be ensured for increasing understandings and skills of people about conservation concepts and management and biodiversity conservation for sustainable success of Integrated Conservation and Development Projects.

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