

Full Length Research Paper

Natural resource use conflict in Bale Mountains National Park, Southeast Ethiopia

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Conflict over natural resources including wildlife, forest, land and water is common particularly in developing countries. It is extremely difficult to sustainably manage a resource if it is under conflict. This study aimed to assess the causes of resource use conflict in Bale Mountains National Park and attitudes of local community towards the Park. Finally, to find measures to reduce resource use conflict. This study was conducted in Dinsho Woreda of Bale Zone, southeast Ethiopia from December 11, 2012 to May 10, 2013. Both primary and secondary sources of data gathering tools such as key informant and stakeholder's interview, focus group discussion (FGD) and household survey techniques were used. The result revealed that conflict of interest between Bale Mountains National Park (BMNP) and the surrounding community could be traced back to the 1970s, the time of the park establishment. The establishment of the park gradually restricted free movement of herds of those living particularly by rearing animals. Gradual expansion of agriculture and the need for more land became additional cause of conflict. Based on the household survey, causes of resource conflict were exclusion of resources access from the park and illegal activity made either individually or in a group to access resources from the park by residents living in and around the park. There was no significant difference among kebeles and wealth classes, except lack of income ($\chi^2 = 8.083$, $DF = 2$, $P = 0.018$). However, majority (63.5%) of the respondents had a positive attitude and the remaining (36.5%) had a negative attitude towards the park conservation. To reduce this conflict, different options were suggested by stakeholders: local community should be involved in the management of the park, compensation scheme should be made for crop raiding and livestock predation by wild fauna, government and NGOs should take initiatives in bringing developmental projects for local communities, and awareness creation of local community should also be made.

Key words: Attitude, illegal activity, management options, protected areas, punishment and stakeholder.

INTRODUCTION

Protected areas (PAs) are the cornerstone of national and international conservation strategies (Dudley, 2008). To date, more than 100,000 protected areas cover 12% of the Earth's land area, of which 28% (by area) are found

in the tropics (Lele et al., 2010). Protected areas fall into one of the six conservation categories ranging from areas that strictly limit human activity to those that allow for sustainable human use (Hayes, 2006). Meanwhile, protected

area management is challenged by conflict of interest between stakeholders; economic or livelihood interest of local people on one side and conservation needs by park management on the other side (Andrew-Essien and Bisong, 2009). Lack of support and conflict between people residing in and around PAs and conservation agencies are other challenges of PA management (Schweithelm et al., 2006).

In Ethiopia, PAs cover approximately 16.4% of the country's land area including 20 national parks, 2 wildlife reserves, 3 wildlife sanctuaries and 17 controlled and 7 open hunting areas and 3 community conserved areas (EWCA, 2014). These PAs are facing many challenges due to growing populations, border conflicts and recurring drought and livelihood dependency of people living in and around PAs (Tessema et al., 2010).

Bale Mountains National Park is one of the PAs found in Ethiopia. It was established by the Ethiopian Wildlife Conservation Organization in 1971 with the primary objective of conserving Afro-alpine habitat and population of rare and endemic species of Mountain Nyala (*Tragelaphus buxtoni*) and Ethiopian Wolf (*Canis simensis*) (Hillman, 1986; Alers et al., 2007; GMP, 2007). It is the largest and most important protected area in Afromontane habitat in Africa. Nevertheless, BMNP had been facing a threat due to local people vested interest (Tessema et al., 2010, 2011). Historically, Bale Oromo known as a pastoralist, locally called *Godantu*¹ was a key feature of people in Bale Mountains. They move their livestock seasonally in order to exploit areas away from their permanent settlement site and moves from place to place in search for grazing land and spring water for their livestock (Barbre, 2013). However, the establishment of BMNP restricted free movements of livestock from place to place. Consequently, in the past two-three decades, this practice had been declined. During this time, barley cultivation became more prominent. Gradually, competition between local community for cultivation and grazing lands was intensified. For those yet primarily pastoralists, it is becoming more difficult to access sufficient grazing lands without pushing into someone else's grazing area or the national park.

The pressure posed on the park via local community was increasing with population growth. Yet, the majority of local community sees no benefits from the park rather incurs costs from the damage of crops by wild animals and restrictions on the use of natural resources from the park (Mamo, 2007; Soromessa, 2007). On the other hand, most community viewed protected areas and wildlife favorably, lack of benefits limited local willingness to aid conservation work (Tessema et al., 2007).

Various studies conducted in BMNP shows the biodiversity richness, endemism of the park and threat the park has been facing (Alers et al., 2007; Soromessa, 2007; Tessema et al., 2010; Vial, 2010). However, the causes of conflict between local community and park

management and attitude of local community towards the park were seldom studied (Mamo, 2007; Tessema et al., 2010). For this reason, this study was conducted to assess causes of resource use conflict in BMNP, to assess attitude of local community towards the conservation existence of the park and finally, to find options which will help to reduce conflict and help sustainable management of the park.

MATERIALS AND METHODS

Description of the study area

BMNP lies within five Woredas² of the Bale Zone: Dinsho in the north, Adaba to the west, Goba to the northeast, Mena-Angetu to the south and Barbare to the east (GMP, 2007; Mamo, 2007). For this study, Dinshoworeda was selected. The administrative town of the woreda is Dinsho, which is located 400 km far from Addis Ababa; the capital city of Ethiopia. The Woreda is located in the coordinates of 7°10' - 7°10'02" N Latitude and 39°55' - 39° 55' 02"E Longitude. The rainfall distribution pattern of the woreda is characterized by eight month rainy season from late March to October (Solomon et al., 2008). In general, the area receives annually 600-1000 mm rainfall in lower altitude areas and 1000-1400 mm in the higher altitude areas (Williams, 2002). It has a mild sub-tropical highland climate with annual mean minimum and maximum temperature of 2 and 20°C, respectively (Solomon et al., 2008).

Historically, people living in Bale Mountain areas were pastoralists (Barbre, 2013). The contemporary livelihood means of the residents are mixed farming (Debele, 2007; Tadesse et al., 2011; Barbre, 2013). The 2007 national census report shows the total population of the woreda was 39,124 (CSA, 2008). For this study, Dinshoworeda was selected purposively based on their proximity to researchers and where BMNP head quarter is found. The woreda has 9 kebeles, of these, 3 kebeles (Gojera, Dinsho 02 and Hora soba kebele) were selected based on their proximity to the park and accessibility for research. Gojerakebele is found inside the park while Dinsho- 02 and Horasobakebele are located outside the park boundary (Figure 1). To accomplish the intended objectives, mixed research (qualitative and quantitative) methods were used.

Data collection methods and analysis

To achieve the intended objective of the study, both primary and secondary data collection methods were used. Firstly, following Pilot survey, nine (9) key informants were selected through Snowball sampling methods. Secondly, in three purposively selected kebeles, Households were selected randomly based on the size of Household population in the three kebeles using formula developed by Yamane (1967) as cited in Israel (2012).

$$n = \frac{1}{(1 + N(e)^2)}$$

n = the intended sample size, e = level of precision (8% level of precision), N = population size. Following random selection, respondents

¹Godantu is name given to the pastoralist in the area and it implies moving from place to place (Barbre, 2013).

²In Ethiopia the highest level of governmental organization is Federal. There are 9 regions and 2 satellite cities, which make up Ethiopia. The regions are divided into zones. The zones are divided into woredas. The woreda is an important administrative level structure for bicultural diversity as they are semi-autonomous in deciding on how the natural resources of their area should be managed. The next level is kebele. Kebeles are a cluster of villages called gots (Barbre, 2013).

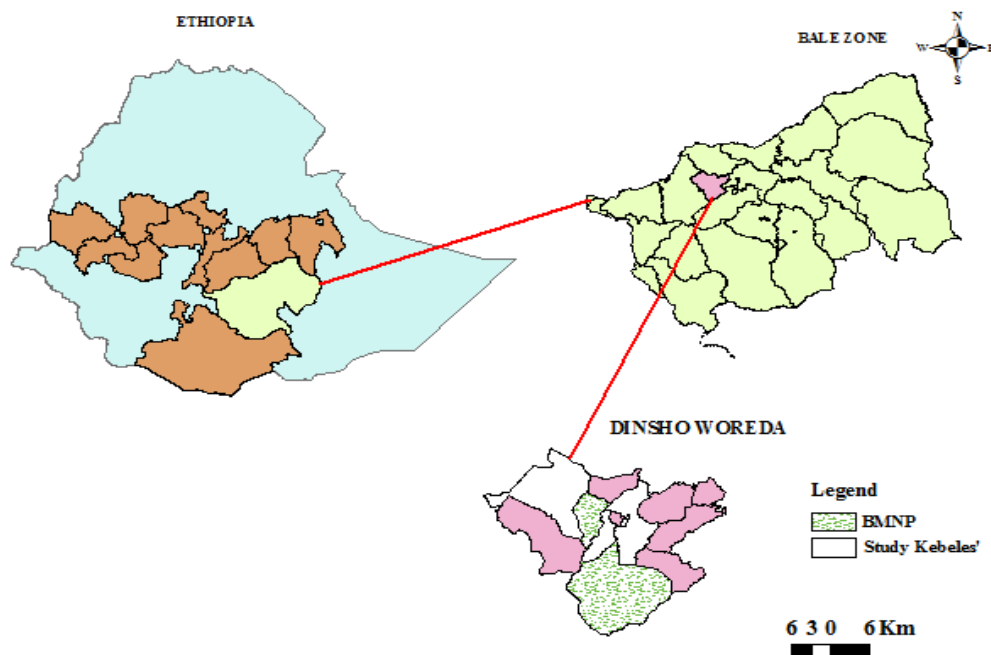


Figure 1. Location map of the study area.

were grouped into three wealth classes. Accordingly, 148 HHs were selected for interview. Thirdly, semi-structured interview were conducted to get detailed understanding of the major issues of the study and to triangulate data obtained through questionnaire. This helps to identify the stakeholders their vested interest (Thorsen et al., 2009). Lastly, a focus group discussion (FGD) was conducted to collect in-depth information from a group of people which represent the population of interest. Totally, Five FGD was held with local communities from three kebeles. FGD were held with the household heads (two individuals from each wealth classes) and youth who do not have a job (from the three kebeles). Three FGD were carried out with household head in each kebele separately and one with young member of the society, those found in the age of 18-28, totally 8 individuals participated in the discussion (2 from Gojera and 6 from the other kebeles). Finally, selected female household head from all kebeles were grouped under one group.

The collected data were analyzed using SPSS version 16.0. To understand underlying motives of conflict in relation socio-economic condition, their home and the attitude of people towards BMNP Pearson Chi-square test (two tailed) was used.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

From the total of 148 respondents, the average ages of household heads are 38 years, the minimum and maximum ages of household head were 24 and 57, respectively. This shows that all the respondents were in the productive age group. The average landholding size of the

household is 2.3 ha. The maximum land holding size was 5 ha while, the minimum was 1 ha. Though, they had large tracts of land, unpleasant cold climate condition made the area known unproductive unlike other highland area of Ethiopia by crop production. As result, their priority livelihood means are livestock rearing than crop productions which corroborate with Asmamawu and Verma, (2013) and Barbre (2013). However, the land holding of households is not statistically different between kebeles ($\chi^2 = 20.35$, DF = 2, P = 0.62). Livestock mainly raised in the area were cattle and sheep. The average size of livestock owned by respondents was 13. Majority of the respondents livestock size ranges in 1-15 (65.5%), followed by 16-25 (27%) and lastly, greater than 26 (7.4%). Concerning their occupations, all respondents have been engaged in livestock rearing as their livelihood means while, 95% of them were engaged in crop cultivation. In addition, 7.4% of them were employed in the park and 5 respondents were employed in other government offices.

Based on information gathered from key informants, households were grouped into three wealth classes for this study which takes into consideration the landholding and livestock size. Accordingly, rich household should have greater than 4 ha of land and more than 15 livestock (more of cattles), while the medium had more than 2 ha of land but less than 4 ha and less than 15 livestock and the poor classes had less size of livestock

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Table 1. Resource types, functions and /or uses and stakeholders of Bale Mountains National Park.

Resources in the park	Function and/ or uses	Who uses, involved and Interested from the Park	Who affected
(i) Land	(i) In direct : Ecosystem Maintenance, Climate regulation	(i) Park management	(i) Local community
(ii) Forest (trees)		(ii) Local community	
(iii) Grasses (Grazing land)		(iii) Cooperatives (iv) NGOs: FZS, EWCP	
(iv) Water	(ii) Direct: Income Biodiversity, conservation, Education, Fodder	(v) Local government: Woreda administration, ARDO, CTO	(ii) The Park (Wild life)
(v) Wild animals			
(vi) Birds and other organisms			

Frankfurt Zoological Society (FZS), Ethiopian Wolf Conservation Project (EWCP), Agriculture and Rural Development office (ARDO) and Culture and Tourism office (CTO). Source: Field observation and interview of park management (2012).

and land than the medium classes. Accordingly, majority (55.4%) of the household were grouped into poor class and followed by medium class which represent 33.16% and the least part, which only takes 11 of them or 7.43% of the respondents were considered as a rich.

Stakeholder identification and conflict of interest

Stakeholders of BMNP identified based on their level of involvement, interest and impact or impacted. Stakeholders are those who are affected either negatively or positively, or those who can affect the outcomes of a proposed intervention (Karl, 2000). Identified local stakeholders of BMNP were; local community, Park management, NGOs such as Frankfurt Zoological Society (FZS) and Ethiopian Wolf Conservation Project (EWCP), local government administration, and sectors that is, Agriculture and Rural Development office (ARDO) and Culture and Tourism office (CTO), cooperatives and higher education (College or University) (Table 1).

Accordingly, primary stakeholders are local community and Park management. They have direct interest in the resource; either because they depend on it for their livelihoods or they are directly involved in its exploitation (FAO, 1998; Karl, 2000). While, identified Secondary stakeholders were local Government, cooperatives and Higher Education Institution; they involved in the Park management through financial, technical and logistic support and interested in the protection of endemic and biodiversity of the park. Local government administration and sectors (ARDO and CTO) have been less involvement but interested to conserve resources sustainably and enhance livelihood of community, cooperatives engaged in tour guide and provision of cultural handicraft and finally, universities or higher institution interest for education and research and participated in Fire breaking considered as a Secondary stakeholders. Generally, secondary stakeholders have indirect interest in management and conservation of natural resources and/or depend at least partially on wealth or business generated

by the resource and intermediaries in the process of delivering aid to primary stakeholders (FAO, 1998; Karl, 2000).

Local community living in and around BMNP had historical interest of resource use from the park due to livelihood dependency. Thus, BMNP have been facing major threat because of growing strain of two contradicting interest of stakeholders (local community and the park management). Biodiversity conservation on one side and economic needs on the other side. According to elder's, interest clash started earlier when the park established and local community denied resource access from the park. The community depends on livestock rearing and moves from place to place in search of fodder for their cattles. Local community had more agricultural land for cultivation as compared to other places in Ethiopia. Unsuitable weather condition limited crop cultivation except Barley, as a result, local community still practice livestock rearing as first priority.

As clearly described above, the primary interest of local community was restricted via the establishment of the park. Though it is illegal and punished by the park, local community does not stopped resources access from the park yet. Consequently, revenue collected through punishment from 2006/07-2012/13 shows increasing trend (Figure 2).

The main resources which local community need to access are land, grass, forest product and water from the park while, the park planned to conserve endemic and other biodiversity of the park by excluding local community. This interest clash of stakeholders is the manifestation of conflict. Illegal activity (livestock grazing and cutting trees) and higher punishment, crop raiding and domestic animal damage and lack of compensation for losses, lack of benefit from the park and low participation of local community in the park affairs created claims and lack of sense of ownership were factors that exacerbated conflict.

Local community directly affected by the establishment of park than any other group. As it stands now, they could not consider the park as a source of benefit rather incurs

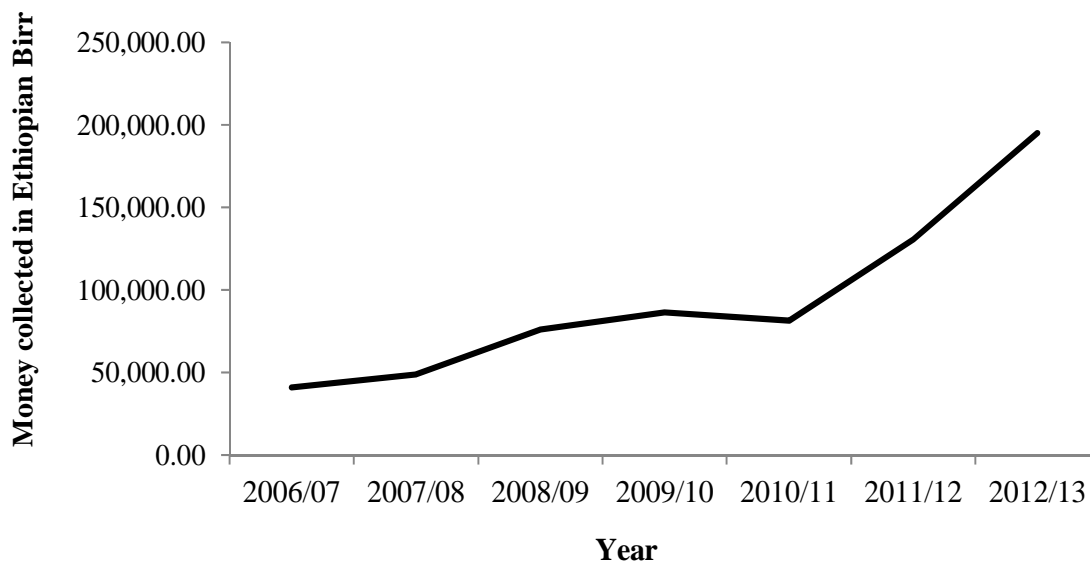


Figure 1. Money collected from local community fines (Source: BMNP, 2012).

cost. As a result, they are considered to be a primary stakeholder. Park management who stands to guard the wild life and have an authority to protect and manage the park is a primary stakeholder, because they are the ones who made decision concerning the park and took responsibility to handle issues pertinent to them (Table 2).

The livelihood dependency and vested interest of local community coupled with park management approach³ underlying causes of conflict. BMNP had been following the so-called 'Yellowstone Model' of parks as wilderness areas, which is conventional and exclusionary. This management approach does not give due consideration to the interest of local community living in and around the park. Such an outcome can undermine protection policies through conflicts between park managers and local communities (Andrade and Rhode, 2012).

Conflicts in PAs can be seen to be the result of competing and diverse interests, goals and aspirations that individuals or groups within legally established and secluded environments have (FAO, 2000; Andrew-Essien and Bisong, 2009). The same is true in the cases of BMNP on which local community depends historically on the resources for their livelihood and conservation interest of the park management on the other side. This is similar to study conducted in Senkele Sanctuary (Tewodros Kumssa and Afework Bekele, 2013).

According to 88.6% of the respondents, causes of park-people conflict were resource use exclusion by the park. This corroborates study made by Asmamawu and Verma (2013) in BMNP. Though, most of the respondents do not heavily dependent on the resources of the park, about 31.1% of them need to access resources from the park to

sustain their lives. As a result, local community illegally accessed resources in the park. Such illegal acts of local community inevitable result in disharmonies relation between local community and the park. Money collected via punishment from 2005/07-2012/12 from local community was a good indicator of increasing illegally activity. Increasing population and illegal activity to access resources from the park were the main factor that instigated conflict. Population living in the park was minimal when the park was established but, currently the size of population increased by 20 folds (GMP, 2007). Thus, put heavy pressure on the management of the park. Studies conducted in Digya National Park in Ghana and Royal Chitwan National Park in Nepal's shows resources use exclusion approach, the PA following and illegal activity made individually and in group in PAs are the main causes of park-people conflict (Nepal and Weber, 1995; Ayivor et al., 2013).

The need of local community to access resources from the park depends on their wealth and Kebele. The poor household head and Kebele found in the park need to have more land for agriculture than medium and rich classes and kebeles outside the park boundary. Household having less size of agricultural land are less likely to be positive regarding conservation of the park (Ngabonziza, 2010). In addition, lack of benefit from the park was underlying causes of park and people conflict. Study conducted by Mamo (2007) in BMNP shows that "local community currently does not see the park, as it stands now, as source of substantial benefit".

The other causes of conflict between the park and local community in BMNP were crop raiding by wild fauna, that is common with Warthog and Mountain Nyala (92.1%) and associated lack of compensation for the damage was the major claims local community raised (Asmamawu and

³Strategies adopted by park management in integrating local residents in the overall management framework (Ayivor et al., 2013)

Table 2. Interest, role and claims of BMNP stakeholders.

Stakeholders	Interest	Involvement/role	Claims/ challenges
Local community	Resources use and access. Income (job and other off-farm activity).	Fire breaking Exposing illegal activities Protection of wild animals.	Resource use exclusion Crop and domestic animal damage Participation and benefit Punishment
Park management	Sustainable management of the park	In all affairs of the park Responsible and accountable	Pressure via Grazing, forest harvesting and settlement.
FZS	Conservation of indigenous and other biodiversity of the park.	Providing technical , logistic and financial support	Lack of financial and technical support by government Population pressure Less support of local government
EWCP (Ethiopian wolf Conservation Project)	Protection of rare Ethiopian wolf from extinction.	Creating awareness about the impact of domestic dog on Ethiopian wolf	Anthropogenic activity(settlement, grazing, fire, agricultural land expansion, Deforestation Disease transmission)
Local government	Sustainable management and livelihood improvement	Less involvement	Illegal activities Local community Claims
ARDO	Natural resource management	Increasing community awareness and cooperation	Conflict
CTO	Enhancing ecotourism activity and income generation		
Cooperatives	Income	Tour guide (horse rent and provision of cultural artifacts)	Decreasing trend in tourist

FZS (Frankfurt Zoological Society). Source: Data obtained from stakeholder's interview (December, 2012 and May, 2013).

Verma, 2013). This phenomenon is common in most protected areas in the world, where communities live in and around protected areas. Crop raiding is the common causes of conflict between local community and wildlife, that is, Koshi Tappu Wildlife Reserve in Nepal and Akegera National Park in Rwanda (Limbu and Kariki, 2003;

Ngabonziza, 2010). Study conducted in Uganda also revealed that wild animals near protected area destroyed 85% of the crop grown (Kagoro-Rugunda, 2004). Likewise, a survey conducted in Nepal showed that wild animals were responsible for 32% of the crop loss (Limbu and Kariki, 2003). Generally, resources access (park-people) conflict,

benefit sharing and human-wildlife conflict are the conflict type between local community and the park (Crawford, 2012).

Attitudes of local community towards BMNP

Majority (63.5%) of the respondents had a favorable

or positive attitude towards BMNP existence and conservation while, 36.5% of respondents had a negative attitude. This is contrary to community living surrounding Ajai Wildlife Reserve in Uganda (Richard, 2006). Positive attitude of respondents linked with benefit is received via involvement in the park and awareness of the role and values of the park. The benefits were expressed in terms of money gained from different temporary employment of local people in the park. This is similar to study conducted in Nepal and Myanmar (Allendorf, 2007; Macura et al., 2011). Participation in the park and associated economic benefit, awareness of the role and values of the park were the underlying factors for positive attitude of respondents, which is similar to study conducted in Marsabit National Reserve in Kenya (Shiba, 2010). Communities surrounding protected areas in most cases could not support biodiversity conservation, because the establishment of these protected areas leads to loss of their traditional economic and subsistence opportunities (Richard, 2006; Bosak, 2008; Andrade and Rhodes, 2012). Though local community currently does not see the park as a source of substantial benefit, most of the respondents living in and around BMNP had positive attitude towards the park.

On the other hand, negative attitude of respondents associated with resource use exclusion, crop raiding and domestic animal damage and lack of compensation for, and higher punishment is posed on local community while doing illegal action. This is similar to study conducted in three upper Myanmar protected areas (Allendorf et al., 2006). Statistically, no significant difference prevailed over attitudes of local community via wealth status of household, respondents living in the park showed their negative attitude than respondents living outside the park which is related to fear of eviction for that matter, they support the removal of the park and unlikely to support the conservation. This result corroborate with study of Ngabonziza (2010). In addition, the proximity of household to the conservation area also brought an impact on the attitude, because communities living closer or with the boundaries of the park suffered from crop raiding and animal damage by wild animals. Furthermore, communities settling in nearby areas to the park had fear of eviction for that matter, they support the removal of the park and unlikely to support the conservation (Ngabonziza, 2010).

Institutional or policy options available to overcome the problem

In order to reduce resource use conflict and improve the relationship between local community and the park, different options were forwarded by stakeholders. According to respondents, 124 (83.8%) of the respondents supported local community should be involved in different activities of the park. Ashley (1995) stated that the success and sustainability of a rural development project depends on

local people's participation in different phases of the project. About 120(81%) respondents raised, more job opportunity should be created and they should receive benefit from the park. Active participation of local communities in developmental projects plays a significant role in providing them with financial benefits for enhancing their livelihoods (Mehta and Kellert, 1998; King, 2007; Andrew-Essien and Bisong, 2009).

The impact of participation clearly observed on the attitudes of local community, where the protected are managed by the state with little local community involvement and community based conservation in which local community took the lion share. Under the some risk, local community supported community based conservation than state based conservation (Andrew-Essien and Bisong, 2009; Lepp and Holland, 2011). Though, local community living in and around BMNP was involved in different conservation activities of the park, their participation was not genuine, only involved during emergencies rather than actively participating in planning and management decisions (Asmamawu and Verma, 2013). Furthermore, household respondents need the park managers to follow their deeds and damage they encounter via wild animals and resource access during the long dry season. To overcome the claims of local community, the park should take measures in paying compensation for crop raiding and domestic animal damage made by park fauna which is supported by 117 (79%) of the respondents. Crop raiding is a real problem faced by farmers around PAs (Fungo, 2011). Study conducted in southern Kenya, regarding predator-damage compensation, Maasai community bears positive attitudes towards the conservation of wild life, though they claim unfair and inequitable compensation scheme (Rodriguez, 2007).

According to key informants and informal interview made with different stakes, punishment rate were decided by community but, they had been complaining the increased punishment per cattle. Local community, NGOs and park management agreed that the current park-people relation is poor and to reverse the current trend, supported idea of awareness should be created for local community. Likewise, to create good relationship between local community and conservation agencies, creating awareness of community was recommended as an essential measure (Allendorf et al., 2006). In addition, focus group discussants affirmed that the presence of the park should bring development of infrastructural activity for the benefit of the local community. The provision of institutional and infrastructure development is the basic options to reduce conflict between park and local people (Andrew-Essien and Bisong, 2009). While strict enforcement of rules and regulation, enhancing local community awareness about values of the conservation and management of the park, encouraging and allowing local community participation and finally, government should pay attention and support the park technically and financially was some of management solution forwarded by park managers (EWCA, FZS

and EWCP).

Conclusion and recommendation

Historically, people living in BMNP area depends on rearing livestock as their priority livelihood means and moves from place to place in search of grazing lands. However, park establishment restricted free movement of livestock by endorsing strict rule enforcement and preventing resources access. Concurrently, local people do not stop access resource from the park though it is considered illegal and liable for punishment. That was the underlying cause of resources use conflict between local community and park management. The identified causes of conflict were: Resources use exclusion approach the park have been following and illegal activity made by local people either individually or in a group to access resources from the park, crop raiding and domestic animal damage by common warthog and hyena, lack of income from the park and dispute with park scouts. In addition to the fore mentioned factors, absence of local community involvement in park affairs, unfulfilled promises of the park in integrating local community in different affairs of the park, higher punishment posed for illegal activity were the main claims raised by local community. Consequently, the park obliged to reduce the park area by 50 km² with the aim of reducing pressure and better management.

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Concurrently, majority of local community could not receive benefit from the park rather they incur costs from wild animal's damage on their crop and domestics animals. Nevertheless, majority had favorable attitude towards BMNP existence and conservation. Participation and benefit received from the park, awareness of the values and roles of the park in for the country is the underlying factors for prevalence of positive attitude.

To reduce the resource use conflict between local community and the park, different options were forwarded by different stakeholders. Accordingly, benefit scheme should be developed for residents, encouraging and supporting participation, and awareness creation of local community and following up their deeds and strict rule enforcement for sustainable park management was some of the essential measure forwarded by the stakes.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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