



COMPLIMENTARITY NOT COMPETITION: CO-EXISTENCE OF COMMUNITY-BASED WILDLIFE CONSERVATION AND PROTECTED AREA APPROACHES IN MOROGORO DISTRICT, TANZANIA

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ABSTRACT

In sub-Saharan Africa, community-based wildlife conservation (CBC) emerged in the 1980s to complement the clearly failing protected area (PA) conservation approach. Over two decades have passed and both the theory and practice of relations between CBC and PA approaches indicate a situation of competition rather than complementarity of the two approaches. This paper uses empirical evidence from Morogoro rural district in Tanzania where a CBC project is implemented next to the Selous Game Reserve to explore why complementarity of the two approaches has remained elusive to-date. Rapid socio-economic and climatic changes have brought rural communities and wildlife even closer together further making it difficult to exclude local people in wildlife conservation. Findings from this study indicate that local communities are willing to complement Governmental efforts in wildlife conservation only when they derive benefits from their participation. The situation of unmet expectations has increased distrust and apathy among local people in participating in wildlife conservation. Governments have a bigger role to play in enhancing complementarity but so far have been reluctant to do so. In the face of predicted climatic changes impacts on wildlife distribution, human population growth, and economic changes, complementarity of the PA and CBC

approaches will even be more important. Without serious transformations on the government side to practically embrace CBC as a complementary conservation strategy, complementarity of the two approaches will remain elusive and hence continued loss of biodiversity.

INTRODUCTION

Combined effects due to climatic changes and pre-existing socio-economic stressors in situations of weak institutions for natural resources management have caused unprecedented loss of wildlife and their habitats in many tropical developing countries (MEA 2005). This interaction of socio-economic, political and climatic factors causing loss of biodiversity at multiple spatial and temporal scales renders both conventional conservation approaches such as the protected area approach and contemporary conservation approaches such as the community based natural resources management approach inadequate for sustainable natural resources management (Ostrom 2007, 2009). The debate on which conservation approach is better suited to sustainably conserve wildlife resources in a rapidly changing world has received sufficient attention. There is sufficient literature arguing for and against each approach (ref). The question of whether and how the two approaches can co-exist to achieve



both conservation and rural development goals remains understudied. This paper analyses complementarity issues between the PA and CBNRM approaches using the case of wildlife conservation in Morogoro rural district, Tanzania where a CBC project was established in 1991 to complement wildlife conservation efforts in the adjacent Selous Game Reserve (SGR). The paper is guided by the question: Is conservation complementarity between the PA approach and the CBC approach possible and if yes, what are the necessary conditions for achieving sustainable conservation under the scenario?

Evolution of the two approaches: PA and CBNRM

The protection areas approach first emerged in Tanzania in 1896 when the Germany Colonial Government established the Selous Game Reserve (SGR) in southern Tanzania. Later on more PA's of various kinds were established including National Parks, Game Reserves, Game Controlled Areas, Forest Reserves and Conservation Areas among others. Independent African states including the socialist independent Tanganyika and later on Tanzania inherited and expanded the protected area approach. For instance, in Tanzania the number of protected areas of various kinds increased significantly between 1961 and 2000 (Baldus 2002).

However, in sub-Saharan Africa, the colonial top-down protectionist conservation approach also known as the "fortress conservation" approach failed to effectively, efficiently and sustainably protect all wildlife and their habitats as evidenced by declining wildlife populations and shrinking habitats since early 1980s (Baldus 2006; Songorwa 1999; Western and Wright 1994). The realized ineffectiveness of the fortress conservation approach led conservationists to seek alternative conservation approaches to complement the failing approach,

particularly for protecting wildlife outside core protected areas (Brockington 2005). The early 1980s coincided with a period of increasing hegemony of neo-liberal tenets of democratic decentralization, free market economy and participation of non-state actors such as non-governmental organizations in managing natural resources and rural development. Such international NGOs claimed to be better equipped with resources (technical and financial) for effective and sustainable biodiversity conservation unlike the poor newly independent African States. The emergence of democratic decentralization and participation approaches provided an additional motivation for involving local communities and NGOs in wildlife conservation. Community Based Natural resources Management (CBNRM) thus emerged first in the wildlife sector and later in the fisheries, forestry, water and pastoral lands in most sub-Saharan African countries. Seeking complementary conservation alternatives was inevitable given increasing poaching pressure outside and inside PAs, increasing occurrence of wildlife outside PAs and increasing costs for poor independent African states to effectively monitor large PAs (Baldus *et al.*, 2003; Brockington 2005 IIED 1994). At the same time, the fortress approach was not abandoned altogether as evidenced by increase in number and size of protected areas at the national, regional and global level. Currently, the world has passed the target of setting aside at least 10% of global land area under PAs whereas Tanzania has dedicated about 39.6% of its total land area for biodiversity conservation (WRI 2006). Conservation complementarity was expected to integrate development and conservation in rural settings where most wildlife occur and confer management rights to local people (Baldus *et al* 2003; Nelson and Agrawal 2008; Western and Wright 1994; Hulme and Murphree 2001; IIED 1994).



While the two approaches were expected to complement each other, they had and still have fundamental differences. Whereas the CBC approach combines conservation and sustainable utilization of wildlife resources as incentives to motivate local people to participate in conservation, the fortress conservation approach prevents local people from accessing and utilizing wildlife resources through establishing strict protected areas or “conservation fortresses” such as national parks (Berkes 2004; Fabricius *et al.* 2004; Hutton and Leader-Williams 2003; IIED 1999; Western and Wright 1994). Moreover, decades of implementing top-down exclusionary conservation approaches resulted in enmity, distrust and hatred between conservation authorities and local people who were all of a sudden expected to achieve long-lasting cooperation in conservation (Songorwa 1999; IIED 1994). Conservationists believed that granting user rights as conservation benefits was necessary and sufficient to transform previous perception of local people as threats to conservation into conservation partners and therefore achieve sustainable management of the resources (Baldus *et al.* 2003; Hutton and Leader-Williams 2003; Jones and Murphree 2004; Murphree 1994; Nelson and Agrawal 2008; Metcalfe 1994). However, conservation threats still remain despite three decades since the introduction of CBC as a complementary conservation strategy to fortress conservation in sub-Saharan Africa.

CBC Implementation in Tanzania

There are two forms of CBC projects based on their location in relation to protected areas. There are those that are established adjacent to a protected area and those that are established elsewhere without sharing borders with protected areas (Songorwa 1999). The first five CBC projects in Tanzania were established in the early 1990s as part of a multi-strategy approach to protect the Selous Game Reserve which was named the Selous

Conservation Programme (SCP). CBC proponents argued that involving local communities in wildlife conservation would reduce costs of monitoring protected areas in the country following rapid decline in wildlife populations in the 1980s. For example, elephant population declined from more than 110,000 in 1976 to less than 55,000 in 1986 and by 1989 the population was less than 30,000 (Baldus *et al.* 2003). More CBC projects were established in the mid-1990s. However, introduction and implementation of the CBC approach was difficult for several reasons including lack of legislation and policy guidelines on CBC; inadequate financial resources by the government to implement the CBC approach; and lack of stakeholder interest, particularly local people following decades of top-down conservation approaches. By 1999, most CBC projects were not delivering promised benefits to local people and therefore local people were not interested anymore in the projects (Songorwa 1999). However, the failure of CBC projects in the mid-1990s did not discourage CBC proponents.

Conservationists, particularly local and international environmental non-governmental organizations lobbied the Tanzanian government to have policy guidelines on CBC and get rid of the old and only policy document; the Wildlife Act No. 12 of 1974 which was not supportive of the CBC approach. Consequently, the Tanzanian government developed and adopted the Wildlife Policy in 1998 which was reviewed in 2007 (URT 2007) three-quarters of whose objectives focus on CBC to emphasize the change in conservation approaches in the country. The Wildlife Act No. 12 of 1974 was reviewed to enact the new Wildlife Act No. 05 of 2009 which provides legal authority to the CBC supportive Wildlife Policy (1998 revised 2007). The policy and legislation documents describe Wildlife Management Areas (WMA's) as the



mechanism for community based wildlife conservation in Tanzania. While the policy and legislation review processes were in progress, the Minister for Natural Resources and Tourism issued Wildlife Management Areas (WMA) Regulations in 2002 (reviewed in 2005) that provide a process for the implementation and legal support for establishing WMAs on village land (WMA Reference Manual 2003; WMA Regulations 2005).

Following the issuance of WMA Reference Manual and Regulations, sixteen pilot WMA projects were established in the country. The guidelines called for a fresh start of all CBC projects irrespective of past arrangements so as to have a uniform approach countrywide. In brief, the eight-step procedures for establishing a WMA begin with local people forming and registering a community based organization (CBO), then prepare land use plans (LUPs). Thereafter project implementers develop a natural resources inventory (NRI) of all wildlife resources occurring in the demarcated area followed by developing Resource Zone Management Plan (RZMP) and mapping the area. Finally the formed CBO applies for the Authorized Association Status (AA) to the Minister for Natural Resources and Tourism. If granted the AA status, the WMA is published in the government gazette and local people will be granted User Rights giving them full management rights over wildlife in their WMA. The Government retains wildlife ownership rights (Wildlife Act No. 5, 2009). The process is complex and requires huge financial and technical capacity to establish. Environmental NGOs and District Councils have so far provided financial and technical support to local communities in establishing WMA's. Before attaining the AA status, the Wildlife Division supervises the implementation of CBC projects including entering contracts with investors.

The re-start of the CBC approach in 2002 following policy and legislation reforms in the late 1990s raised local people's expectations once again despite a situation of unmet expectations from CBC implementation between 1990 and 1999 (Mshale 2008). As of July 2009, twelve of the 16 Pilot WMA Projects had been granted the AA status, two had withdrawn from the process and two are still in process. JUKUMU Society –the study site for this research – has not been granted the AA status despite being the first to finish all requirements and being the first to apply for the status. In the past, corruption was mentioned by several conservationists both from the government and non-governmental organizations to be the main barrier to effective adoption and implementation of the CBC projects (Siege 2001). The JUKUMU WMA has the highest diversity and abundance of wildlife in the country and therefore has the highest economic value, influencing corrupt officials to delay conferring full management rights to local people. However, there have been major changes in the Tanzanian ministry responsible for natural resources management and deliberate efforts to get rid of ineffective government officials were evidenced by the President's decision to make major changes in the ministry (Nipashe Newspaper, 04/19/2009). With the new Act and new leadership in the Ministry, CBC has a promising future in Tanzania.

MATERIALS AND METHODS

Study Area

This study was conducted in the Morogoro District WMA also known as the JUKUMU Society. JUKUMU is the Kiswahili abbreviation for this CBC project which translates to "*the Society for Preservation and Sustainable Utilization of Wildlife Resources in the Ukutu Valley*".

JUKUMU Society is located in the northern most part of the Selous Game



Reserve in the Ukutu Valley on the dry side (leeward of the Uluguru Mountains. It is one of the 5 WMAs surrounding the Selous Game Reserve. (Figure 1: shaded area number 1)

The study area was selected based on the author's prior visit to the area in 2004 while interning for the Selous Game Reserve. Repeated visits to the study sites in 2005, 2007 and 2009 enabled the author to establish good relations and trust with local people necessary in this kind of research that involves probing into illegal activities, e.g. poaching. The JUKUMU Society provides an opportunity of a comprehensive assessment of the

implementation of the CBC approach given its various features including: it is the oldest CBC project in Tanzania (was established in 1991 and got registered in 1996); it is the largest CBC in Tanzania in terms of number of participating villages, land area set aside for conservation (approximately 42% of its land), and has the highest diversity and abundance of wildlife thus high economic value; moreover JUKUMU was the first to complete the process for applying for the WMA status and yet has not been gazzeted and therefore local people still do not have full management rights of wildlife resources occurring in their area.



JUKUMU and CBC in general. Semi structured household questionnaires were used to conduct about 350 household surveys. Use of semi-structured questionnaires allowed for respondent's flexibility in responding to the questions and capturing information that would have been missed using structured questionnaires (Bernard 2000).

Sampling strategy and effort

Systematic sampling strategy was employed and conducted at three levels: village level, sub-village level and household level. This multistage sampling was a result of previous findings in 2005 whereby differences in interests to participate in the CBC project and attitudes towards wildlife conservation were observed at these different levels (Mshale 2008). Factors used in village selection included location in relation to the Selous Game Reserve, amount of village land contributed to the WMA and village size in terms of population and area. These factors affect the village's participation in the CBC project whereby: proximity to the Selous Game Reserve corresponds with more human-wildlife conflicts and therefore more negative attitudes towards conservation; size of village land contributed to establish the WMA influences villages' perception of benefits to be received whereby those villages that contribute larger portions believe that they should receive more benefits than others. Proximity was categorized into near and far villages: near is defined as within 20km from the border and beyond 20km as far. Sub-villages were categorized into near and far based on their walking distance from the village center whereby those beyond 30 minutes walking distance were categorized as far-households. All the 22 villages in the JUKUMU society are connected by one unpaved main road and each village has a village center that is within 0.5km from the road (Figure 2). Several factors were used in selecting households including different socio-

economic activities, gender of the household head, duration that the household members have lived in the village, highest education level attained by the household head, and socio-economic status determined by locally acceptable indicators of wealth/poverty status such as farm size, household size and house type.

RESULTS

The first section of results presents conservation and demographic information to provide basis for the need for complementarity: that is the two areas border each other and therefore protect essentially the same animals. The second section presents information on local people's access and utilization of natural resources to stress on the point that separating local people from wildlife resources is a costly endeavour given their dependence on the resources. The third section of results presents information on benefit sharing through CBC since complementarity relies on providing benefits as incentives for local people's participation in conservation. Benefits include village hunting quota, development fund and reducing human-wildlife conflicts. Moreover, in order to achieve complementarity, there must be readiness and willingness for cooperation not only from the local people but also from conservationists, particularly the central government. Findings on the government's readiness to cooperate with local communities in conservation are included in the discussion. No quantitative analysis was conducted on government's readiness; instead text analysis of various important government documents related to the CBC implementation in Tanzania documents was used. The author also used public statements made by influential officials in the Ministry of Natural Resources and Tourism and individual interviews with government officials. .

Conservation Information



About 27% of the total area of Morogoro District is under some form of protected area (Table 1). The JUKUMU Society is a joint CBC project of 22 villages in the District. While the WMA area as a proportion of the entire district area seems

small (3.7%), if at looked in terms of the proportion of land area for only member villages, it accounts for about 42% of the total village land for the 22 member villages.

Table 1: Extent of protected areas in Morogoro District

Total area sq km	Total protected area and (proportion)	Area and (proportion) within SGR	Area and (proportion) within MINAPA	Area and (proportion) of the WMA	Area and (proportion) of forest reserves
19,316	5329 (27.59%)	1,600 (8.2%)	1,200 (6.2%)	709 (3.7%)	1,820 (9.4%)

Source: SGR General Management Plan (2002)

Table 2: Population and area of the 8 sampled villages (Source SGR GMP 2002)

Village Name	Population	Number of Households	Area km	sq Wildlife area	% of wildlife area
Nyarutanga	3,670	612	98.3	48.8	50
KisakiKituoni	2,225	371	179.2	100.5	56
Sesenga	1,357	339	82.5	11.4	14
Milengwelengwe	1,404	281	16.2	00	00
Mbwade	3,509	585	128.8	78.5	61
Bonye	2,625	384	164.5	51.1	31
BwiraJuu	881	220	38.5	21.6	56

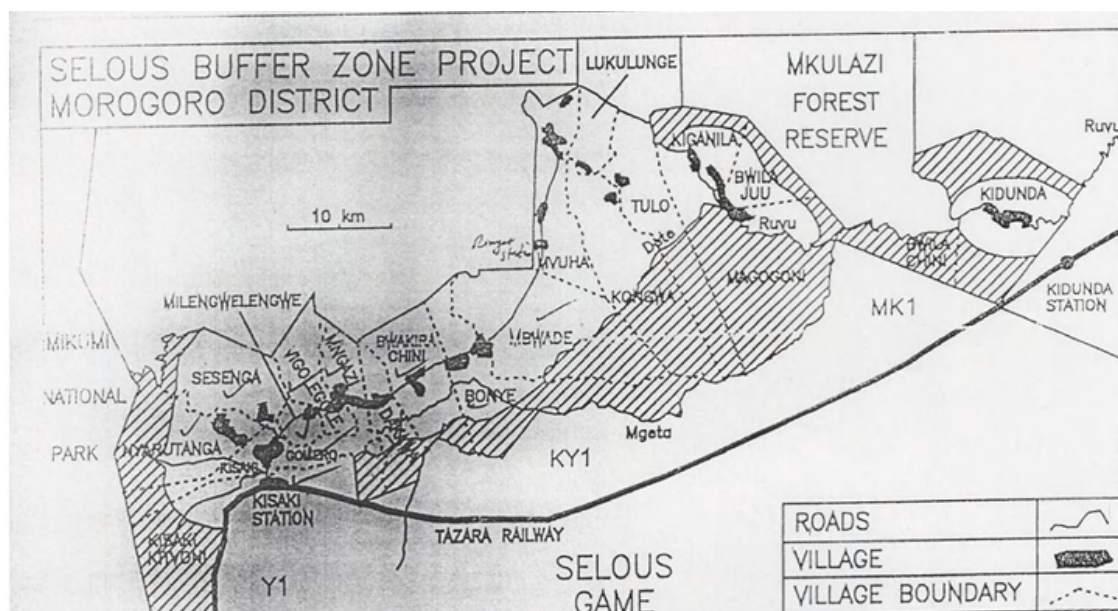


Figure 2: Member villages of the JUKUMU WMA (Source: SGR General Management Plan 2002)

Not all villages have contributed the same amount of land to constitute the WMA. Of

the 22 member villages, five have not contributed any land for the WMA, seven



have contributed less than 50% of their village land and ten villages have contributed more than 50% of their village land to constitute the WMA. Table 3 presents this information for the eight villages covered in this village. Those villages that have not contributed any land to the WMA were included in the project because they are almost surrounded by villages that have contributed land for the WMA. The reason given for their inclusion was that, if they are not included they could potentially harbor poachers. This decision however, was not done by the villagers but by the Wildlife Division following advice of the GTZ Technical Advisor.

Total population in the 22 villages that compose the JUKUMU Society is 47,135 in 8,322 households with average household size of 6 people ranging from one person to a maximum of 22 members per household. JUKUMU society is a diverse community in many aspects. Although the proportion of each ethnic group was not available, three ethnic groups are native to the Ukutu Valley namely Waluguru, Wakutu and Warufiji. Other ethnic groups include Wamaasai, Wapogoro and Wachaga who migrated to this area from their native places elsewhere in the country for various livelihoods related reasons. Main socio-economic activities in the area include small-scale farming and livestock keeping.

Demographic Information

Table 3: Crops grown in Morogoro Rural District

Ethnic Groups	Waluguru, Wakutu and Warufiji
Subsistence Crops	Rice, cassava, millet, maize, beans and bananas
Cash Crops	Rice, maize, sesame
Plantations	Sisal, cotton and sugarcane
Livestock	Ranching, agro-pastoralism 0.5 cattle per household and 0.35 sheep/goat per household

Source: SGR General Management Plan (1995)

Table 4: Sources of funds for JUKUMU (sources: JUKUMU annual reports 2004-2005)

Source of fund	USD*per annum
Anti-poaching fund from Intercon Hunting Safaris. Intercon is the only company with a hunting lease in the JUKUMU WMA	5,224
Rent charges from Sable Mountain Lodge	9,000
Revenues from sale of crocodile skins through a crocodile hunting quota	1,493
Funds from the retention scheme (through a retention scheme, 25% of revenues from tourist hunting is retained for the district and 75% accrues to the national treasury)	1,493
Visitor camping charges of \$ 5 per night per person	Indeterminate (no data)
Total	17,210

(US \$ 1 = TZS1340 BoT Exchange rates of March 2009)



Natural resources utilization

Local people in the JUKUMU society obtain various natural resources from village land and the WMA for household consumption and sale outside the area. Conservation rules prohibit local people from obtaining forest products from inside the Selous Game Reserve and from the WMA in order to prevent destruction of wildlife habitats. Wild meat can be hunted through organized hunting by village game scouts using an annual quota provided by the Director of Wildlife. All respondents were aware of the three protected areas bordering their villages which are the JUKUMU WMA, Mikumi National Park (MINAPA) and the Selous Game Reserve. Most respondents (89%, n= 348) are familiar with wildlife conservation regulations including being prohibited from killing wildlife and obtaining any forest products from the protected areas. Nevertheless, illegal utilisation of wildlife and forest products is taking place.

Wildlife

None of the respondents reported consuming wild meat in their homes other than the occasional meat sold at the village obtained through the village hunting quota. However, 80% (n=314) of the respondents claimed to know someone consuming wild meat at their homes obtained from illegal hunting. The author confirmed this information with observations of meat being sold selectively to customers at several small restaurants. Illegal wild meat is usually sold very early in the morning and to specific people who are not likely to report the sellers to the game scouts. Wild meat hunting and sale has created a sub community within the larger community. Common wild meat includes impala, wildebeest and buffalos. The price for wild meat is slightly lower than beef and goat meat. The reason for the lower price is to ensure quick sale of the meat. No one is willing to keep the meat for long for fear

of being reported and arrested by village game scouts.

Forest Products

Information on forest products is included here since extraction of certain of these products may have adverse impacts on the wildlife habitat quality. People obtain several forest products for household use and for sale. Forest products and their response frequencies include fuel-wood (100%), building poles (35%) and thatching grass (50%), trees for charcoal production (5%) and timber (1%). The low frequencies in trees for charcoal and timber are because these activities require specialized skills, therefore only a few people obtain them and sell to others. Therefore, the low frequencies do not imply that fewer trees are cut for timber and charcoal, rather these two are the main concern for villagers that supply of timber and charcoal to nearby big towns of Morogoro and Dar es salaam have resulted into serious loss of their forests. Also, charcoal production and timber involve illegal cutting of trees in the protected areas, which could further explain the low frequencies because no one is willing to self-report illegal activities. Thatching grass and building poles have low frequencies because these are one time products and usually people would re-thatch or cover leaking parts of their roofs once every other year or two years. Fuel-wood requires special attention. Majority of respondents (98% n=349) reported using fuel-wood for household energy for cooking (100%). On average, each household uses one bundle of fuel-wood in three to four days (a bundle has 30 pieces with a diameter of about 10cm and about 150cm in length). Most respondents (67%, n = 349) reported decline in the amount of fuel-wood near the village, necessitating moving far away in search of fuel wood. None of the respondents reported collecting fuel-wood inside the game reserve but occasionally collect inside the WMA (7%, n=349).



Benefits from Conservation to Local People

Following the issuance of WMA Regulations in 2002 by the Minister of Natural Resources and Tourism, 16 pilot projects were identified and the implementation plan was adopted at a stakeholder workshop that was held in Bagamoyo, near Dar es Salaam in 2002 (reference). Local people were not present at this important workshop. Instead, they were represented by technical assistants and project coordinators from different conservation organizations who worked with different CBC projects in the country. JUKUMU society was represented by the GTZ Technical Advisor to the JUKUMU project. Workshop stakeholders agreed on two main forms of benefits: improving social services and reducing impacts of human-wildlife conflicts. In addition, the Director of Wildlife agreed to provide a hunting quota of 13 animals for the five CBC projects surrounding the Selous Game Reserve (Figure 1). For the JUKUMU Society, each village was to receive a flat rate village development fund of approximately \$373 per village per year to be used at the discretion of the village (USD 1 = TZS 1340; BoT exchanges rates of March 2009). Social services to be improved included renovating and building new classrooms for schools, health centers, drilling water holes, constructing bridges and improving the main road connecting the 22 villages with Morogoro town.

The pilot phase was for three years (2002-2005) and the results from the evaluation of the pilot projects were to be used in scaling up the CBC approach at country level. JUKUMU was one of the 16 pilot projects. The new CBC design named WMA and its implementation plan ignored any previous arrangement for each of the selected WMAs. It should be remembered that JUKUMU was established in 1991 and registered in 1996, therefore the new plan required a fresh start for JUKUMU including new registration and land use

planning. The implementation of the pilot phase was delayed for about 10 months due to inadequate financial resources to start the pilot phase. None of the 16 pilot projects was evaluated by September 2005. By 2008, twelve of the 16 pilot projects had been evaluated and upgraded to full WMA status called Authorized Association (AA) Status. JUKUMU has not reached the AA status yet. Two of the pilot projects decided to withdraw from the complex process of applying for the AA status.

Status of benefit sharing

As of 2009, none of these benefits have been provided as promised in 2002. Instead, benefits have been declining over time. Provision of wild meat from the village hunting quota and provision of the development fund have been decreasing over time from 2003/04 to 2008/09. Human-wildlife impacts have been increasing over time. Declining benefit provision corresponded with increasing disinterest to participate in conservation thus affecting any cooperation intentions/plans. Interestingly, in the JUKUMU WMA one village has been receiving more benefits than any other village in terms of the number of animals hunted and the development fund distributed. This village is called Kisaki Station. When asked to explain the situation, JUKUMU leaders stated several reasons for providing more benefits to Kisaki station village including: Kisaki has contributed the second largest land for the WMA; the Sable Mountain Lodge which generates more than 50% of JUKUMU revenues is located in this village and also the village has very aggressive leaders. Before joining JUKUMU, the lodge owners paid the village directly but now the village is getting a small fraction of the revenues since the revenues now have to be shared with 22 other villages. Kisaki Station is the only village that is actively pursuing to withdraw from the CBC project claiming that it will have more



revenues and would manage the wildlife resources better than being part of the JUKUMU society. Kisasi Station leaders complain that the JUKUMU Society took more land than what the village had agreed to provide. The author had the opportunity to read minutes of the village assembly that agreed to allocate land for the WMA and also several correspondences between the village, district officials, JUKUMU, investors, director of wildlife and minister of natural resources and tourism regarding their land conflict. The issue is not resolved yet. The Wildlife Division is forcing establishment of one large WMA instead of several smaller village level WMAs as Kisasi Station prefers. Clearly, in the view of the wildlife division, wildlife conservation takes precedence over livelihood improvement since the situation of establishing a single large WMA adversely affects livelihood benefits that were obtained by Kisasi Station in the past. This situation might have compelled JUKUMU leaders to make sure Kisasi Station receives all benefits in order to keep them interested in the CBC project.

Wild meat

While the village hunting provided by the Director of Wildlife was 13 animals, review of hunting JUKUMU and villages' hunting records reveal that the actual number of wild animals hunted and supplied to the villages was significantly low. On average, the number of wild animals actually hunted and supplied to each village has been declining over time from 6 animals during the 2003/04 hunting season to 4 animals in 2005/06 and zero animals in 2006/07. There were no records from both JUKUMU and the villages on the numbers of wild animals hunted during 2007/08 and 2008/09 although villagers and leaders reported that wild-meat was sold during the reported period. This situation of hunting less than the quota provided is termed "quota underutilization" and the Wildlife Act (2009) allows the Director of wildlife to

re-allocate the underutilized quota to other users such as tourist hunters. Similar to the un-equal distribution of development funds between JUKUMU villages, some villages have been receiving more wild meat than others. The main reason for the differential distribution of wild meat given by the technical assistant and JUKUMU leaders was that some villages are located further away from where the hunting was conducted and since they did not have enough fuel, they could not reach distant villages. Other reasons for the underutilization of the hunting quota include insufficient ammunition, inadequate manpower in terms of game scouts who had to conduct other duties such as anti-poaching and were thus not available for the hunt, and difficulties in sighting animals particularly in July and August when grass is very tall. Moreover, the start of the hunting season depends on the issuance of the annual hunting quotas by the Director of Wildlife division. The hunting season was changed by the Director in 1999 from nine months to six months, thus reducing the time for conducting hunting. Sometimes the Director delayed communication on the annual hunting quota by a month or two, thus further limiting the amount of time available for hunting. Interestingly, in 2007 the Director of Wildlife reduced the village hunting quota from 13 animals to 5 animals per village. In his communication, the Director said that villages missed out potential revenues since they underutilized their quota for various reasons in the past and therefore the unutilized quota should be added to the tourist hunting quota and the revenues generated from tourist hunting would go to the JUKUMU Society. However, because JUKUMU has not been granted the AA status yet, the revenues accrue to the national treasury instead of the JUKUMU society.

Development fund

Similar to the hunting quota, the amount of development funds distributed to each



village has been decreasing since 2003. The average amount per village was US \$ 223 in 2003/04 and US \$ 149 in 2004/05 (1USD = TZS 1340; March 2009reference?) reference?. There was no data for subsequent years for most villages. Most of the leaders had records of funds received in 2003 and 2004 but had no records for subsequent years. Some said that they had received some funds but they could not remember how much and when since they had no records. There was no data at the JUKUMU headquarters since the society does not have an accountant anymore following the end of the GTZ support in 2005. For villages that received some of the development funds

complained that the fund was provided in very small installments with no proper documentation, resulting in misappropriation of the funds. However, JUKUMU received its revenues from various sources as presented in Table 5 but did not distribute among villages, arguing that the revenues were all spent for administration activities such as conducting anti-poaching patrols and for JUKUMU leaders to attend meetings in Morogoro and Dar es Salaam. All village leaders in the eight villages visited in this study complained that there is no transparency and accountability in the way JUKUMU leaders manage the organization.

Table 4: Farmers response on wild mushrooms processing and storage

Parameter	Category	Masasi		Ndanda		Mean	
		n	%	n	%		%
Process wild mushrooms	Yes	9	7.3	36	17.6	12.5	
	No	114	92.7	168	82.4	87.6	
Mode of processing	Drying in the sun and store	9	95.5	30	83.3	89.4	
	Blanching with salty water and drying in the sun	0	0.0	6	16.7	16.7	
Reasons for wild mushroom processings	Increase shelf life	3	33.3	0	0.0	33.3	
	Hygienic	3	33.3	12	57.1	45.2	
	Easy to handle	3	33.3	6	28.6	31.0	
	Consumer preference	0	0.0	3	14.3	14.3	
Package dried mushroom	Yes	9	75.0	21	70.0	72.5	
	No	3	25.0	9	30.0	27.5	
Packaging materials	Plastic bags	3	33.3	18	85.7	59.5	
	News papers	3	33.3	0	0.0	33.3	
	Clay pots	3	33.3	3	14.3	23.8	

Note: NS=not significant at $p \leq 0.05$; * significant at $p \leq 0.05$; ** significant at $p \leq 0.001$. For numbers not adding up to 333, values are missing.

Table 5: Farmers response on wish for training on oyster mushrooms production technology

Parameter	Category	Masasi		Ndanda		Mean	
		n	%	n	%		%



Ever received training on oyster mushrooms production technologies	No	87	67.4	204	100.0	83.7
	Yes	42	32.6	0	0.0	16.3
Wish for oyster mushroom production training	No	12	9.5	39	19.4	14.45
	Yes	114	90.5	162	80.6	85.6
Reasons to lack of knowledge on oyster mushroom production technology	No training has been offered	72	55.8	198	97.1	76.5
	Too occupied to learn on new crop	9	11.1	3	1.5	6.3
	Not interested	0	0.0	3	1.5	1.5
Reasons for wish for oyster mushroom production technology	New crop	18	14.3	24	12.7	13.5
	Income generation	12	9.5	15	7.9	8.7
	Household food security (relish)	93	73.8	111	58.7	66.3
Areas of interest if training is to be offered	Production	9	7.1	24	11.9	9.5
	Utilization	3	2.4	3	1.5	2.0
	Production and utilization	114	88.4	162	80.6	84.5
	Processing	0	0	12	6.0	12.0

Note: NS=not significant at $p \leq 0.05$; * significant at $p \leq 0.05$; ** significant at $p \leq 0.001$. For numbers not adding up to 333, values are missing.

Reducing impact of human wildlife conflicts

Human-wildlife conflicts are common in Morogoro District. These conflicts take many forms including crop damage, property destruction, occasional injury and deaths to humans and livestock predation by wild animals. One of the benefits promised to local people from participating in wildlife conservation was provision of assistance to local people to control problem animals. This assistance was not inform of compensation. Instead, village game scouts are expected to go to the place where the incidence is taking place and chase the animals away from the farm. Local people are not supposed to harm or kill wildlife for any reason. They are supposed to use scare tactics to chase away the animals.

Crop damage by wild animals was reported by all respondents (100% n=350). Elephants, hippopotami and monkeys were mentioned as the major problem animals. On average, wild animals destroy about 20% of the crop yield with the amount being higher in some villages than in others depending on the proximity to the

protected area. Crop destruction was reported higher in farms close to the game reserve than in farms close to the village center. Three villages namely Sesenga, Dakawa and Mngazi reported the highest levels of crop destruction by wild animals averaging between 25% and 35% of the crop yield, while Kisasi, Gomero and Nyarutanga reported the lowest levels of below 10%. These levels were self-reported levels triangulated through field visits and using averages. Most respondents used metrics such as a quarter, one-third or a half as a measure of loss in crop yield due to destruction by wild animals. Some respondents compared harvests between different years to estimate loss in yield while others used estimate of area of land that was trampled on or destroyed by wild animals as a measure of the loss. The author reduced the reported percentages by 15% to take into account climatic factors that affected crop yield. For instance, heavy and earlier than normal rainfall in 2007 destroyed crops and also drought in 2005 destroyed crops as well. Bitterness expressed by the villagers can also be used to stress the seriousness of the human-wildlife conflicts. For instance, one old man in



Dakawa village, sarcastically commented that:

“...yes, conservation is working because more wild animals are destroying our crops...what should we do? in this area they (wildlife) have more rights than people ...”

Such a statement hints at the bitterness local people have over their damaged crops. Incidents of crop raids are however not necessarily due to increased number of animals but by behavioural responses of the animals since they are not harmed when they invade farms. There is no animal census data to know whether wildlife population has increased or not for the past 10 years.

When asked whether they get any assistance from JUKUMU or the Selous Game Reserve in case of problem animals, 76% (n=350) of the respondents stated that they never get any help. When the 24% that responded affirmatively were asked whether help arrives in time, all of them stated that the JUKUMU Game scouts are always late, coming 2 to 3 days after the incident by which time the animals would have destroyed their crops and left already. Villages near JUKUMU Headquarters have the advantage of getting help in time because they can communicate through easily to the JUKUMU headquarters. These include Mbwade, Bonye and BwakilaChini.

Injury and occasional human deaths: On average at least five people get injured per annum and one person dies per annum as a result of attacks by wild animals in the 22 JUKUMU villages. In 2004, at Milengwelengwe village two people were killed by crocodiles and 6 attacks by hippos were reported in Mngazi, Dakawa and Nyarutanga villages. In 2007 one villager was attacked by a leopard. Interestingly none of the villagers mentioned the incidence of deaths and injury by buffaloes. Reports from the

health centre, the technical advisor and JUKUMU leaders indicated there are more injuries and deaths due to buffalo attacks than any other wild animal. On further probing I learned that most buffalo incidences involve illegal hunting in the protected area and therefore local people did not report those to avoid being implicated in undertaking illegal activities. Similar results were recorded in 2007 about buffalos. Most respondents either agreed about buffalo incidences or just laughed and avoided the discussion when I deliberately attempted to bring the buffalo discussion up.

DISCUSSION

While CBC was designed to complement the PA approach, particularly for protecting wildlife occurring outside PAs, past implementation of the CBC approach has been perceived by both practitioners and theorists as a competing strategy rather than complementing the fortress conservation approach. The competition perception stems from the assumption that if a conservation approach has failed then it has to be abandoned and replaced with an alternative approach. On the ground, competition is manifested by several factors including distrust, enmity and hatred between local people and conservation authorities. Complementarity of the two conservation approaches is inevitable and not optional because the approaches protect essentially the same animals since the animals move between the two protected habitats. This is because, wildlife, unlike humans do not recognize PA boundaries set by humans. Compared to other natural resources such as forests, wild animals are mobile and can move between places over time. In future, wild animals are projected to expand their habitat ranges in response to expected climatic changes (Parmesan 2006; Hannah and Salm 2005). Based on observations made over time by local people, game scouts and professional hunters in the



JUKUMU WMA and inside the Selous Game Reserve, already wildlife occur in higher numbers outside the Selous Game Reserve than inside. In recent years, professional hunters inside the Selous Game Reserve have been complaining about difficulties in sighting animals during hunting while local people outside the reserve complain about increased human-wildlife conflicts, claiming it is due to increased wildlife populations outside the reserve as a result of implementation of the CBC project. Like the fortress conservation, JUKUMU society lacks adequate resources to effectively manage the WMA. Enmity between local people and conservation authorities leads to declining wildlife populations and destruction of habitats.

Although complementarity is inevitable, it requires proactive and sustained efforts by both government conservation authorities and local people with non-governmental conservation organizations providing the needed support. At the centre of all these efforts is the need to rebuild trust between conservationists and local people that has been eroded following decades of top-down conservation approaches (Songorwa 1999, Baldus and Siege 2001). Rebuilding the trust is not achievable through benefit sharing alone, but through addressing several issues. Berkes (2004) identifies five important characteristics for CBC to operate effectively. These are the importance of cross scale interaction, adaptive co-management, incentives and multiple stakeholders, use of traditional ecological knowledge and development of cross cultural ethics. As presented in the results section, the CBC project in the Morogoro District does not satisfy any of the characteristics. It has been shown that local people are willing to cooperate in conservation if they receive benefits from conservation (Mshale 2008; Songorwa 1999; Metcalfe 1994; Murphree 1994). For instance, following the re-establishment of the CBC approach in Tanzania in 2003

with renewed promises, decrease in poaching was recorded in the JUKUMU WMA as indicated by fewer poachers arrested and fewer traps set in the protected area. Over time, poaching and encroachment resumed because local people were not provided with the promised benefits while their lives still depend on natural resources. Government officials blame local people for the failure of CBC to achieve its intended goals while local people blame the government for not providing the needed support in establishing CBC projects. Governments have the role of building the capacity of local people in order to be effective wildlife managers once they are conferred with full management authority. However, there were no deliberate efforts by the government to enhance JUKUMU's management capacity. The JUKUMU society has very low capacity to manage wildlife resources including inadequate financial resources, insufficient human resource, and lack of organizational management skills among JUKUMU leaders. Some authors for example Baldus *et al.* (2003) point out that governments have been a hindrance to achieving cooperation between conservationists and local people in many countries.

CBC perceived as competing with fortress conservation

The failure of the fortress conservation approach has been used to argue for the emergence of community based conservation by many authors. Using this line of thinking, yields two outcomes: either fortress conservation has to be abandoned and replaced by an alternative approach or an alternative approach has to be adopted to complement where the fortress conservation has failed. Theorists (Adger *et al.* 2001) have argued that the emergence of CBC implies a paradigm shift from classical conservation through populist to neo-liberal approaches. Even more because the fortress conservation has "failed", then CBC is held at higher



standards expected to outperform the fortress approach. This line of thinking is wrong because while numerous CBC projects have been established in many countries, no single PA has been replaced by a CBC project. Instead, the two approaches co-exist either side by side or on the same landscape or ecosystem. Therefore, there has been no clear paradigm shift in wildlife conservation, instead two or even more paradigms coexist at a point in time but in different spaces. Moreover, fortress conservation has not failed completely rather it operates under very high costs. However, it is worth noting that much of the current tropical biodiversity enjoyed today is a result of setting aside strict PAs.

The perceived competition is evident on the ground as well. It is further exacerbated by the lack of trust between government conservation officials and villagers. Each side is worried that the other side cooperates with poachers, particularly commercial poachers coming from outside the area. Selous Game Reserve officials said that they do not organize joint anti-poaching patrols with JUKUMU leaders because JUKUMU leaders would leak information to poachers about anti-poaching plans and therefore jeopardize the good intentions. When the author mentioned this to JUKUMU and village leaders, some leaders agreed that there is some illegal cooperation between some villagers and poachers but they do not have full details. However, JUKUMU and village leaders responded by saying that some government officials also collaborate with commercial poachers. Each side even went as far as to mention names of specific individuals involved in illegal hunting. This study found evidence of cooperation with commercial poachers both among villagers and among government officials. In order for anyone to get to the JUKUMU WMA or Selous Game Reserve by car, one has to use the only main road that leads to this area (Figure 2). Therefore, commercial

poachers have to pass through several villages to get to the protected areas. Some villagers harbour poachers and in return they receive wild-meat or monetary payments. On the other hand, some of the poachers who go to these areas collaborate with government officials or are sent by some corrupt government officials. Allegations of government officials collaborating with poachers have been reported several times in local news media. For instance, recently, the Minister of Natural Resources and Tourism called for a press conference to share findings from her recent visits to several PAs in the country. In her statement, the Minister said that there are government officials who are involved in illegal hunting of wildlife and export of live wildlife (Nipashe Newspaper 04/19/09). When there is no cooperation between the two parties, conservation effectiveness is seriously affected.

Complementarity is possible

In order to achieve complementarity, both local people and government conservation officials must agree to cooperate and make deliberate efforts to enhance the cooperation. Given past implementation of conservation approaches, the government has a bigger role to play in enhancing this cooperation. Local people have practically expressed their willingness to cooperate if provided with benefits from conservation. Poaching levels declined following the establishment of CBC projects in the early 1990s but resumed following a situation of unrealized expectations. Similarly, the second episode of re-introduction of CBC in Tanzania in 2003 saw a decline in poaching which resumed because benefits were not provided to local people. Local communities have been cheated twice; will a third episode of CBC win their support now that Tanzania has a new Wildlife Act and new leadership. Similarly, CBC projects such as CAMPFIRE in Zimbabwe, ADMADE in Zambia and LDP in Namibia have failed to protect wildlife and have not contributed to improving rural livelihoods



mainly due to lack of conservation authorities' pro-activeness in enhancing conservation capacities and rebuilding trust with local people (Songorwa 1999). The introduction of these projects in other countries also saw a new zeal and motivation by local people to participate but over time communities became disinterested in the projects since raised expectations were not realized. Governments have been responsible for delay and ineffectiveness of most of the CBC projects in eastern and southern Africa. In Tanzania, the government through the Ministry of Natural Resources and Tourism provided guidelines for the establishment of CBC projects through WMA. The procedures for the establishment of WMA are not only written in English but also in technical terms that local people cannot understand. To prove reluctance of the government in embracing the CBC approach, the Tanzanian Director of Wildlife stopped the circulation of translated WMA guidelines to local people (Baldus 2006). Complementarity is possible if significant reforms are made regarding governance, particularly central government changes (Nelson *et al.* 2007).

CONCLUSION

CBC and the fortress conservation approaches have been perceived as competing instead of complementing each other. Evidence of competition is found both in literature and in practice. The two conservation approaches should complement each other, especially since they essentially protect the same wild animals that move between the two types of protected areas when they are connected. Complementarity is possible but needs to take into considerations concerns of local people and reluctance of governmental officials. Given past experiences, each side is wary of the other. However, past distrust should not hinder potential future cooperation in order to

achieve effective wildlife conservation. CBC is becoming inevitable given the increase in number of wildlife outside PAs due to various factors and the difficulties in expanding or shifting PAs to correspond with new habitat ranges for wildlife. CBC was not designed to compete and/or replace the fortress conservation. CBC is not a conservation panacea. CBC is one other conservation strategy that can be effective in human dominated landscapes since it integrates rural livelihoods and wildlife conservation.

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