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Are we missing Synergies between Conservation and Development Objectives? Insights from the Serengeti National Park Outreach Programme

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Abstract: The contribution of outreach programme (OP) to the livelihood of communities adjacent Serengeti National Park (SNP) was investigated. Perceptions of communities on the OP were explored together with ascertaining the challenges facing the local communities. Ninety-five households and 7 key informants were interviewed. Logistic regression was used to determine the communities' perception towards effectiveness of OP in supporting livelihoods. In general, results for household survey indicated that services provided by SNP were ineffective in supporting livelihood of local communities attributable to benefit sharing antagonism between park management and the local communities. The perceived ineffectiveness of OP was significantly linked with lack of/or minimal community participation in decision making for proposed projects and not the insufficiency of funds. Crop raiding and livestock depredation are the main challenges facing the communities adjacent SNP and are perceived to impact negatively on livelihood and invariably alleged as ensnaring people into poverty traps. Mitigation measures recommended include individual guarding of livestock at night to reduce the risk of predation, forming groups for night patrol and promptly notifying the rangers about wildlife invasion. The compensation scheme on damaged crops though promising, it lacks the institutional mechanism for its implementation and thus fails to provide incentive for local communities to deliver conservation. We recommend that for the attainment of viable synergies between wildlife conservation and communities' livelihood, enhanced awareness, enhanced participation of local communities and realignment of the current financial support to community initiated projects with the fair and equitable sharing of the benefits, are essential.

Key words: *Wildlife conservation, outreach programme, perception, community livelihood, benefit-sharing.*

1.0 Introduction

The approach of linking conservation of wildlife in and around protected areas (PAs) to community livelihoods is inevitable (Holmes, 2003: Kideghesho *et al*., 2007: Dickman, 2010: Ebua, 2011: Karanth, 2012). The logic behind this approach is that living next to PAs has both advantages and disadvantages to local people. The advantages include both tangible and intangible incentives communities get from protected area management while disadvantages are destructions to human properties and life caused by wild animals (problem animals) (Kideghesho *et al.,* 2007).Globally, various literatures (Brandon and Bruner, 2008; Dudley *et al.*, 2008; Coad *et al.*, 2008) reveal that, most of protected areas distribute conservation benefits to local communities mainly through provision of social services like schools, roads, and dispensaries.

In sub Saharan Africa, for instance, Kenya earned over US$300 million per year from tourism and aimed to disburse 25 per cent to communities around the park (Dudley *et al.,* 2008) with recent report showing further increases in benefits to local communities (Stolton *et al.*. 2015).

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Uganda also made provisions for sharing 20 per cent of national park entry receipts with local communities (Dudley *et al.*, 2008). However, in the face of the policy affirmation and the current efforts aiming at making wildlife a positive development factor, these efforts had a minimal desired impact on the local economy (Schmitt, 2010). In Tanzania, the Tanzania National Parks (TANAPA) through Community Conservation Service (CCS) effects the revenue sharing policy with adjacent communities through a fund called Support for Community Initiated Projects (SCIP) in which communities prioritize the projects to be supported (Kaswamila *et al.*, 2011). However, the form in which these benefits are delivered to the local community do not satisfy them (Kideghesho, 2001) and also they are minimal. This provides little or no direct link to the economy of the individuals or households.

The TANAPA has been implementing Community Based Conservation (CBC) popularly known as "Outreach Program (OP) or *Ujirani Mwema*" over two decades now for the purpose of forging links with the local communities in conservation of wildlife and sharing benefits generated by the wildlife (Kaswamila *et al.*, 2011). The OP and more specifically the SCIP calls for community to take part in the implementation of the prioritized projects. The OP also targets to reduce Human-Wildlife Conflicts (Kideghesho *et al.*, 2007). Despite the benefits that OP has provided regarding conservation knowledge imparted to local leadership and communities (TANAPA, 2013), available information explaining the achievements attained by OP in improving livelihood of poor local communities living adjacent to National Parks indicate mixed results but mainly gloominess unless participatory approach is embraced (Gillingham and Lee, 1999; Infield and Namara, 2001; Gibbes and Keys, 2010; Nyahongo, 2010; Mfunda and Roskaft, 2011; Kaswamila *et al.*, 2011). Reasons behind the poor performance of these interventions include; inadequate benefits (compared to costs of conservation); inequitable distribution; undelivered promises and unrealized expectations, lack of, or limited participation of communities in decision-making for resource management (Kideghesho *et al.*, 2007; Mc Guinness and Taylor, 2014). For instance, in SNP the Key Result Areas (KRAs) performance stood at 48% which is below average (Kaswamila *et al.*, 2011).

Several studies indicate that in order to achieve a win-win situation between communities and conservation agencies, more emphasis should be put on adjacent communities by applying projects which are double barreled, that is able to provide general socio-economic projects and those which have impact at household level (Matiko and Kaswamila, 2011; Makupa, 2013). Despite the economic importance of wildlife nationally, the local communities surrounding the protected areas barely derive benefits sufficient enough to offset the wildlife-induced costs. This greatly diminishes incentive for the local communities to show the sense of stewardship in conservation efforts. The current study aimed at unravelling the deep-rooted grievances, negative attitudes and perception, ill sentiments or dissatisfactions from adjacent communities despite almost two decades of implementing the OP. The specific objectives were to explore local communities' perceptions towards OP support on livelihood to SNP adjacent communities and to ascertain challenges facing local communities living adjacent to SNP.

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2.0 Methodology

2.1 Study Area

The study villages i.e. Tamkeri, Gwikongo, Bonchugu and Bisarara were selected from three wards which are adjacent to SNP. They are located between latitudes 1° 30' and 2° 00' and longitudes 34°50' and 35°10'E (Fig. 1). They range between 1 and 10 km from SNP. These four villages were selected because they experience human-wildlife conflicts as a result of crop destructions and livestock depredation. The climate of the study area is subtropical, with a dry and relatively cool season from May to August, a warmer and still quite dry season in September and October, and a rainy and quite hot season from November to April. As of 2012 the population of the study villages was 13,620.

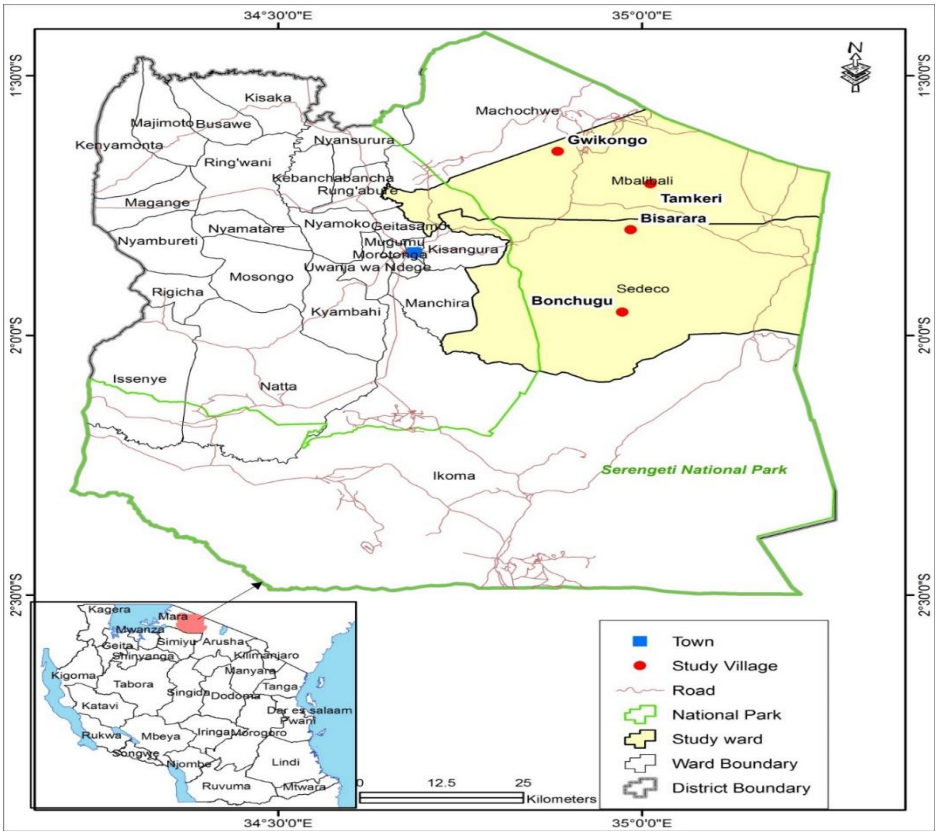


Figure 1: Location of the study area

2.2 Data collection methods and analysis

A cross-sectional research design was used together with a combination of random and purposive sampling techniques. Data were collected through key informant interviews, household questionnaire survey, physical observation, and documentary review. A stepwise forward multinomial logistic regression (Hosmer *et al*., 2013) was performed using IBM SPSS version 20 to determine which variables predict the communities' perception towards effectiveness of OP in supporting livelihoods. Multinomial logistic regression is used when the dependent variable is categorical and the explanatory variables are continuous or categorical. In the current study, multinomial logistic regression sought to unravel the relationship/strength between the dichotomous dependent variable (that is unsure (0) about OP supporting livelihood

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or sure (1) that OP effectively supports livelihood) and the 2 independent predictor variables in response to the statements whether current level of community participation in projects influences livelihood and are you satisfied with funds provided by SNP. The statements were collapsed from five categories into two for the sake of analysis.

3.0 Results and Discussion

3.1 Demographic characteristics of respondents

The socio-economic characteristics of the respondents are shown in Table.1. Approximately 70% of the respondents were in the age range of 18-45 years old. This is the group which ought to be actively involved in production and that commensurate the need for self, government or private employment opportunities. The thrust for securing employment or earning an income is further justified by the need to cater for the daily requirements of the relatively high household size (80% of households have more than 5 members). This household size in the study area is high when compared to other rural areas in Tanzania. According to the 2012 population census, the average family size in rural areas ranges between 4.2 and 5 (URT, 2014). As for education, three-quarters (74.7%) of the respondents had low level of education (primary school). This provides a precedence of for denying them some employment opportunities deemed rightful for secondary school leavers or higher. Moreover, low levels of education of respondents could imply unawareness and lack of appreciation of wildlife resources, especially harboring the engrained belief that wildlife threatens their livelihoods. This belief or attitude consequently spurs irresponsible behaviours towards wildlife conservation which could likely escalate human-wildlife conflicts similar to findings by Larson *et al*. (2016). People in the study area depend primarily on farming (50.7%) and livestock keeping (49.3%) as their main socio-economic activities. The major crops grown include maize, beans, sorghums, millet, sweet potatoes and cassava while livestock kept include cows, goat, sheep, and donkey.

Table 1: Demographic characteristics of respondents (n=95) in villages around Serengeti National Park

Variable		Proportion of Participants (%)				
		Bisarara	**Tamkeri**	**Gwikongo**	**Bonchugu**	**Average**
Age	18 - 25	9.7	0.0	10.5	27.6	12.6
	26 - 45	52.1	57.7	47.4	69.0	57.9
	46 -60	38.2	42.3	42.1	3.4	29.5
Household size	1 - 4	19.0	7.7	10.5	37.9	20.0
	5 - 8	52.4	50.0	21.1	55.2	46.3
	> 8	28.6	42.3	68.3	6.9	33.7
Education	Informal	0	30.8	5.3	6.9	11.6
	Primary	85.7	53.8	68.4	89.7	74.7
	Secondary	9.5	15.4	26.3	3.4	12.6
	University	4.8	0.0	0.0	0.0	1.1
Occupation	Farming	61.9	53.8	42.1	44.8	50.7
	Livestock keeping	38.1	46.2	57.9	55.2	49.3

3.2 Community perception towards OP in supporting livelihoods

The findings regarding effectiveness in supporting and sustaining community livelihoods revealed mixed results. Identified services are presented in Table 2. Across the four villages, respondents showed that classroom construction ranked first (29.98%) among the services provided by SNP outreach programme followed by water tank (19.45%), maintenance of teacher

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houses (15.32%), construction of village dispensary (14.50%), provision of teaching and learning material for schools (10.93%) and construction of watering point for livestock (9.83%).

Table 2: Services provided by SNP OP

Village	Services provided by SNP (%)					
	CC	**WTC**	**VD**	**WPL**	**MTH**	**TLM**
Bisarara	38.1	14.3	0.0	4.8	19	23.8
Tamkeri	19.2	26.9	23.1	15.4	7.7	7.7
Gwikongo	31.6	26.3	21.1	5.3	10.4	5.3
Bonchugu	31.0	10.3	13.8	13.8	24.2	6.9
Average	29.98	19.45	14.50	9.83	15.32	10.92

Key: CC= Classroom Construction, WTC= Water Tank Construction, VD= Village Dispensary, WPL= Watering Point for Livestock, MTH= Maintenance of Teacher Houses, TLM= teaching and learning Material for schools

The construction of water tanks in primary schools is the way through which SNP support the water services and to ensure water availability to the schools. People in the study area mostly depend on water drawn from rivers such as Tabora B River and other seasonal rivers that cross the national park. The water from these rivers is not clean and safe. As expressed by Molina-Murillo *et al*. (2016), sharing of socio-economic benefits is vitally important in maintaining a healthy relationship between local communities and protected areas and that the benefits need to be earned and distributed in an integrated way. The construction of village dispensaries is another support provided to the community to ensure smooth provision of health services to the villages around the national park as well as the maintenance of teachers' houses and provision of teaching and learning materials to primary schools are among of services provided to the community to support education in the village surrounding the national park. Villages with dispensaries in the study area are Tamkeri and Bisarara while villages which received support on renovation of teacher's houses and in receiving teaching materials were Tamkeri, Bonchugu and Bisarara.

The constructions of several watering points for livestock are also one of SNP outreach programme support. Constructed water points within and outside protected areas are meant to deter livestock from entering the protected area in search for drinking water (Kisingo, 2013). Moreover, provision of support services accentuates the understanding that for effective development of communities, then the benefits accrued from protected areas ought to meet the community anticipations and also be participatory (Molina-Murillo *et al.*, 2016). Currently water points for livestock are in Tamkeri and Gwikongo villages.

3.3 Community perception on OP effectiveness

Field findings indicate that services provided by OP were ineffective in supporting livelihoods of the adjacent communities. Regression results (Table 3) show that current level of community participation in decision making on projects was inadequate in influencing communities' livelihood and that improvement was needed to enhance participation. Even though evidence from the field suggests that insufficient funds provided by SNP outreach programme influence the effectiveness of OP and on livelihood, the regression analysis results fail to support that linkage.

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Table 3: Results of multinomial logistic regression with effectiveness of OP in supporting livelihoods

			95% CI for Odds ratio		
		B(SE)	Lower	Odds Ratio	Upper
Unsure about OP supporting livelihood	Intercept	-0.551(0.302)			
	Funds provided by SNP are satisfactory	0.188(0.441)	0.508	1.207	2.866
	I think participation in decision making on projects is adequate	1.657(0.699)*	1.331	5.244	20.658
OP effectively supports livelihood	Intercept	-3.263(0.87)			
	Funds provided by SNP are satisfactory	0.198(1.076)	0.148	1.219	10.045
	I think participation in decision making on projects is adequate	2.755(1.167)*	1.595	15.719	154.94

(*P < 0.05)

That notwithstanding, however, possible explanation could be that the funds provided cater for projects serving the whole community instead of implementing projects whose impacts can trickle down to individuals and households such as Income Generating Activities (IGA). Similar findings were obtained by Strickland-Munro and Moore (2013) who showed that local communities indicated negative attitudes when benefits of nature-based tourism did not translate into community development and contributions to livelihoods at community and household levels.

3.4 Influence of economic opportunities brought by SNP on livelihood

It is worth noting that the OP aimed at strengthening neighbouring community and local government support for conservation, and reducing threats to SNP resource values through improved community natural resource management in adjacent villages. However, lack of alternative economic opportunities leaves the communities with few options than to continue with farming and livestock keeping which lead to negative impact on the environment and the protection of the wildlife in the national park (disincentive to tourism).

Table 4 shows that on average, 12.6% of employments were found in the campsites and in hotels 10.0%, selling fruits and vegetable (14.8%), selling curio products (12.3%). These are the major economic opportunities received by the community by the virtue of neighboring the national park. These opportunities in the campsite are mainly low cadre jobs such as security guard, driving, and laundry. The aforementioned economic activities notwithstanding, the majority of respondents (50.3%) consider as not enough to justify their being close to the national park. These results align with findings of Homewood *et al*. (2012) and Mbaiwa (2003) who indicated local resentment and negative attitudes to nature based tourism and protected areas (PAS) due to lack of integration of tourism into the local economy that would allow local people to participate and benefit from tourism.

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Table 4: Economic opportunities brought by SNP

Village	Economic opportunities by presence of SNP				
	EIC (%)	EISE (%)	SFV (%)	SCP (%)	NEV (%)
Bisarara	14.3	14.3	14.3	9.5	47.6
Tamkeri	15.4	11.5	15.4	15.4	42.3
Gwikongo	10.5	10.5	15.8	10.5	52.7
Bonchugu	10.3	3.5	13.8	13.8	58.6
Average	12.63	9.95	14.82	12.3	50.3

Key: EIC= Employment in Campsite, EISE=Employment in SNP, SFV= Selling Fruits and Vegetable, SCP= Selling Curio Products and NEV= No Economic Venture.

3.5 Identified livelihood challenges and their influence to poverty of people

Crop raiding was identified as one of the challenges faced by the local communities in the study area. The main crops affected are mainly maize, millet and cassava. Other crops affected include sorghum, sweet potatoes and beans. Elephant is the major wild animal involved in crops destruction. Crop raiding by African elephants (*Loxodonta Africana*), blackbuck (*Antelope cervicapra*), and wild pig (*Susscrofa*) erodes local tolerance and thereby impedes conservation efforts similar to results by Bayani et al. (2016).

In Bisarara village respondents indicate crop damage from raiding (71.4%) as the most important accelerator of poverty, while for Bonchugu village livestock invasion by wild animals (41.4%) appears as the leading accelerator of poverty among local communities (Fig. 3). Paying fines (21.1%) and shortage of the grazing land (15.8%) in Gwikongo village are important accelerators of poverty. The damage of crops by the wild animals accelerates poverty attributable to the food insecurity. Meanwhile the livestock depredation by wild animals also accelerates poverty because livestock are considered important capital assets.

During the dry seasons, there is shortage of pasture and water for livestock which at times tempts the herders to graze their livestock inside the national park and by so doing; they expose themselves to being apprehended by park rangers. Therefore, while conservation and poverty reduction are ought to be tackled together, but the surrounding communities perceive activities meant to implement conservation initiatives as accelerating instead of reducing poverty. These perceptions are similar to findings by other scholars who indicated that conservation can accelerate poverty (Brockington and Wilkie, 2015; Ariya and Momanyi, 2015).

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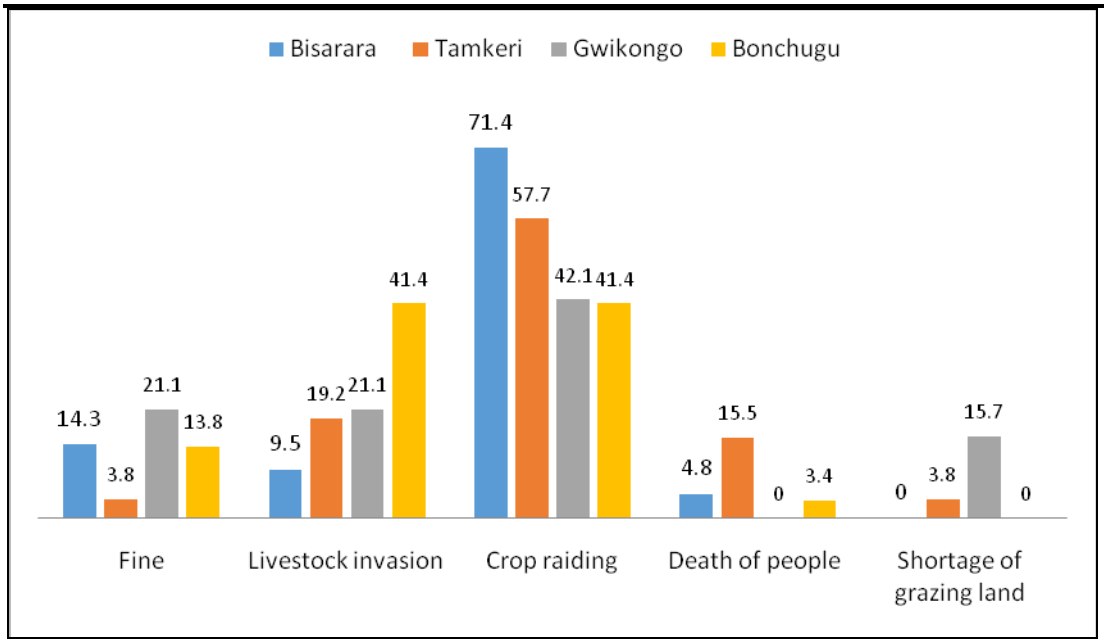


Figure 3: Contribution of SNP to the poverty of communities

3.6 Compensation for crops damage caused by wildlife

Communities affected by crop raiding are normally compensated as per Wildlife Policy of 1998 (as revised in 2007) and the compensation range between TZS 100,000 and 1 million. In recent years, compensation schemes for damages caused by wildlife have gained popularity (Bulte and Rondeau, 2007). While compensation for crop raiding losses have been instituted, the receiving communities claim dissatisfaction emanating from the amount paid which is considered not enough and procedures for implementation perceived too bureaucratic. On compensation, the Agricultural Extension Officer (AEO) for Mbalibali ward argued that communities are not satisfied with the compensation rate, others complain of the elongated process they have to undergo (assessment procedures) which takes up to a year or more. The long process involved could probably be insufficiency of the number of AEOs in the study area. During the study we observed that one AEO can serve up to three or more villages. Results of compensation for crop damages caused by wildlife are in agreement with the results of other studies (Kideghesho and Mtoni 2008; Ogra and Badola 2008; Kwaslema and Roskaft, 2015).

3.7 Measures to combat the wildlife damage to crops and livestock

Crop damage and livestock depredation problems have increasingly become severe in villages bordering SNP. As a result, villagers have adopted a number of strategies (Table 4) to minimize the problem which include individual night guard (44.65%), forming groups for night patrol (31.95%) and informing the Rangers for wildlife invasion (23.4%). Though many households are guarding their farms, the methods are becoming less effective season after season. Therefore, the villagers have to keep changing the strategies to protect their crops from wild animals. As it is unlikely that a single solution would work for mitigating the problem, an integration of multiple measures was deemed appropriate, similar to the insights by Watve *et al.* (2016) who discourage the dependence on certain mitigation measures due to the possibility of those measures being counterproductive under some conditions. They are also in agreement with results by

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Mwakatobe *et al.* (2014) which indicated that communities developed and adopted different strategies to protect their farms because they realized that no single approach was efficient enough to deter the crops raider.

Table 4: Measures to combat the wildlife damage to crops and livestock

Village name	Measures to combat crops and livestock wildlife damage			
	Individual night defense	Forming group for night patrol	Informing wildlife ranger	Total
Bisarara	47.6	33.3	19.1	100.0
Tamkeri	46.2	19.2	34.6	100.0
Gwikongo	15.8	68.4	15.8	100.0
Bonchugu	69.0	6.9	24.1	100.0
Average	44.65	31.95	23.4	100.0

Source: Field data, 2017

4.0 Conclusion and Recommendations

The study aimed at assessing the contribution of OP in enhancing the livelihood of communities adjacent to SNP. Results indicate that SNP through its OP provides the funds to support income generating activities, but the funds do not appear to provide substantial benefits in terms of long-term conservation or poverty alleviation. The lack of/or poor involvement of local communities to decision making in community-based conservation projects was reported a contributory factor to ineffectiveness of OP in enhancing community livelihood. Crops raiding and livestock depredation were reported as the main threats to the livelihood through effects on local people's food security and were considered as significant ingredients ensnaring them into poverty traps. Mitigation strategies adopted by villagers to minimize the problems include watching crops at night (44.65%), forming groups for night patrol (31.95%) and informing the Rangers for wildlife invasion (23.4%). Communities have developed and adopted the different mitigation strategies to protect their farms due to the realization that no single approach was efficient enough to deter the crops raiders. Despite the challenges brought about by crop raiding and livestock depredation, enhanced awareness of the value of wildlife conservation is still required to promote pro-conservation attitudes. Our findings highlight the potential to synergize OP and efforts to promote wildlife conservation whilst mitigating human-wildlife conflicts. The success of this potential could be brought by increased awareness of local conservation issues and enhanced participation in community-based conservation projects. Moreover, the focus would be on the realignment in the current financial support to the projects and the current benefit sharing mechanisms with the aim to ensure equitable distribution and bias avoidance. Results further indicate the need to revisit the current participatory approach in decision making of projects with a view to allow more participation of the local communities. By increased awareness and enhancing participation to projects, the OP has the capacity to address most of the challenges and the local communities could reciprocate in wildlife conservation initiatives.

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