



Assessing Factors Influencing Local Communities' Compliance with Wildlife Conservation Regulations in Tanzania: A Case of Burunge Wildlife Management Area

¹J. Tang'are and ²I. Mwanyoka

¹Department of Geography,
University of Dar es salaam,
Dar es Salaam, Tanzania

²Department of Geography and Environmental Studies,
University of Dodoma,
Dodoma, Tanzania

Corresponding Author ccjoant@gmail.com

ABSTRACT

Reducing conflict in wildlife resource use is critical to institutions overseeing community compliance with wildlife regulations. While understanding of community compliance to wildlife conservation regulations and the contributing factors is important, this area is yet to be adequately explored. We collected quantitative and qualitative data in villages adjacent to Burunge Wildlife Management Area using household surveys, in-depth interviews and focus group discussions. We then used SPSS statistical software and NVivo as tools to analyse our quantitative and qualitative data respectively. Results showed that majority (77.5%) of the respondents complied with the wildlife regulations and the rest (22.5%) violated the regulations. The relative importance of the factors influencing compliance varied considerably between the observed regulations. The detection probability was statistically significant to influence the regulations. Moreover, descriptive norm in WMAs regulations and by-laws, compatibility of WMAs regulations and fisheries regulations, and participation in the formulation of regulations had significant influence on compliance with the regulations. Thus, the Burunge WMA establishment has contributed to deterioration of community's conservation norms. Relevant government agencies should therefore enhance collaboration with other stakeholders to enhance communities'

compliance with the regulations, as well as ensuring community participation in decision making.

Keywords: Wildlife – Conservation – Regulations – WMA – Compliance – Burunge.

INTRODUCTION

Since the 1980s, several countries in the developing world have witnessed a change in the management of wildlife resources from fortress conservation to community-based wildlife conservation (CBWC) (Bluwstein 2018). The former approach, which was inherited from colonial rule, operated under strict rules accompanied by severe punishment that prohibited human activities, and direct utilization of resources but allowed activities such as tourism and research to take place, which are not directly related to neighbouring communities (Parker and Bleazard 2001, Kideghesho 2008). This exclusion of local communities caused detrimental effects on the wildlife resources, including illegal hunting, illegal fishing, settlement and farming encroachment (Ogotu *et al.* 2011, Rai *et al.* 2021).

In this regard, developing countries in particular have increasingly taken measures to curb the situation by adopting CBWC, with much expectation that they could increase the effectiveness, legitimacy, and sustainability of wildlife resource



conservation (Cockerill and Hagerman 2020, Benjaminsen *et al.* 2013). Tanzania, in particular, took an approach that allowed local communities living near wildlife resources to participate in conservation and benefit from the process by introducing Wildlife Management Areas (WMAs). WMA is a community-based conservation model developed specifically to ensure sustainable conservation and utilization of wildlife resources (Cockerill and Hagerman 2020, Nelson *et al.* 2007; United Republic of Tanzania [URT] 1998). Essentially, WMAs are village lands devoted for wildlife conservation (Noe *et al.* 2019, URT 1998). The adoption of the WMA was successful following the adoption of the Wildlife Conservation Policy in 1998, later revised in 2007, and the enactment of the Wildlife Conservation Act 2009. The Act introduced various guidelines to conserve wildlife resources, both inside and outside core protected areas. In this regard, the government implemented WMA Regulations in order to effectively operationalize WMAs in the country (Shemwetta and Wilfred 2010, Shoo *et al.* 2021).

Although Lee *et al.* (2017), revealed that, the initiative has motivated local communities to comply with wildlife conservation regulations, Moyo *et al.* (2017), indicated that newly established protected areas are prone to non-compliance of regulations guiding conservation of wildlife resources by local communities. Nonetheless, the status of local communities' compliance with rules guiding wildlife resource conservation in Tanzanian WMAs is unclear, since the aforementioned scholars studied compliance in a direct way of questioning the respondents. Such techniques may cause participants to refrain from responding or may give false responses (Davis *et al.* 2019). To overcome this potential data collection setback, the designing of data collection tools should consider including anonymous identity of the respondent and questions should be developed carefully from less

sensitive to sensitive ones (Nuno and St John 2014).

In the context of this study, we note that so far, enough attention has not been paid to the factors influencing communities' compliance with the wildlife conservation rules of WMAs' resources. This paper therefore, aspires to assess local communities' factors influencing compliance with wildlife resources in the Burunge WMA. The factors influencing compliance have been documented to be complex; in this respect, scholars have advocated models to study the way factors motivate compliance behaviour (St John 2010, St John 2012). However, such studies have concentrated more on other sectors, such as marine protected areas and national parks, while paying little attention to WMAs. As a result, little insight exists as to how local communities comply with different conservation regulations in the context of WMAs which are run by both central and local governments.

Theories underpinning this paper

In this study we used two theories namely the Rational Choice Theory (RCT) and the Theory of Planned Behaviour (TPB). These theories were developed by Becker (1968) and Ajzen (1991) respectively. The RCT posits that human beings are rational creatures; they make decision to comply or not to comply based on costs and benefits of the decision. Individuals use their self-interests to make choices that will provide them with the greatest benefits. Thus, individuals will comply with rules when calculated monetary costs from non-compliance exceed the benefits (Becker 1968). This happens when there is severe punishment and high probability of detection (Becker 1968). Nevertheless, individuals' decision-making processes are not always influenced by economic factors but are sometimes influenced by normative factors even if the expected returns from non-compliance exceeds penalties (Bisack and Das 2015). Given, this shortfall emanating from the RCT, the modified TPB by Hu *et al.*



(2018) comes into play. The TPB points out that individuals act rationally, according to their perceived norms namely; descriptive norm of perceived prevalence of behaviour of most people in society (Tomas *et al.* 2015) and rules legitimacy (Rivis and Sheeran 2003, Hu *et al.* 2018). These factors are not necessarily actively or consciously considered during decision-making, but form the backdrop for the decision-making process. Other researchers have employed the two theories to investigate compliance of resource users in other sectors such as fishery and wildlife (Oyanedel *et al.* 2020, Hatcher *et al.* 2000).

Through this study we explored local communities' compliance with wildlife conservation regulations and assessed drivers on the compliance behaviour. We conducted the study using a case study approach to understand local communities' actual and perceived compliance with the rules governing the Burunge WMA. Although these rules were different and were enforced by officials from different institutions, they were used to manage resources found in the same wildlife reserve. The officials included the Village Executive officers (VEOs) of the adjacent villages who were responsible to enforce village by-laws under the Local Government Authority (LGA) Act, 1982, the Game Officers who oversaw the WMA Regulations of 2012 under Wildlife Conservation Act (WCA) of 2009 as well as the Fisheries officers who were responsible to oversee implementation of the revised Fisheries Regulations of 2020 under the Fisheries Act of 2003.

MATERIALS AND METHODS

Description of the study area

We conducted the study in four of the ten villages that form the Burunge WMA. This is one of first established WMAs in Tanzania. It is also reported to be one the most financially successful WMAs (Moyo *et al.* 2016). Based on these factors we deemed it to be an information-rich WMA and hence

ideal for our study. Our selection of the four villages (Vilima Vitatu, Kakoi, Manyara and Magara) was informed by the fact that; Vilima Vitatu and Kakoi are agro-pastoral villages while Manyara and Magara villages solely depended on agriculture as their main economic mainstay. We also selected the four villages considering their differing resource endowments. While Manyara and Magala are poorly endowed with wildlife resources, Kakoi and Vilima Vitatu villages are rich in wildlife resource endowment (Kengera 2016). These characteristics represented the rest of the villages.

The WMA is found in Babati district, Manyara region, Tanzania. It is located between latitudes 4.00°S and 3.30°S and longitudes 35.30°E and 36.00°E (Figure 1). The four villages selected have a total population of 3,206 people. The Burunge WMA is surrounded by diverse ethnic groups such as the Mbugwe, Barbaig, Maasai, Iraqw, and others (Bluwstein *et al.* 2016). Crop farming and livestock keeping are the main economic activities in this area. The WMA was gazetted in 2006 as a community-based wildlife conservation area connecting Tarangire and Lake Manyara national parks (Kicheleri *et al.* 2018, Moyo *et al.* 2017).

Study strategy and data collection methods

We adopted a cross-sectional strategy that incorporated both qualitative and quantitative approaches. We collected our data using four techniques: key informant interviews, focus group discussions, household survey, and literature review. We conducted in-depth interviews with a range of key informants (KIs) at district council and village levels involving various respondents including district legal officers, game officers, fisheries officers, village executive officers, Authorized Association (AA) officers and lodge operators. We selected these respondents purposively as we believed them of having the most and relevant information given their positions and responsibilities. We used this method to



solicit and capture information to get a clear understanding on local communities' awareness of the conservation rules governing the Burunge WMA, their

compliance with the WMA's rules, and the normative drivers of compliance. We audio-recorded all the KIs upon their consent.

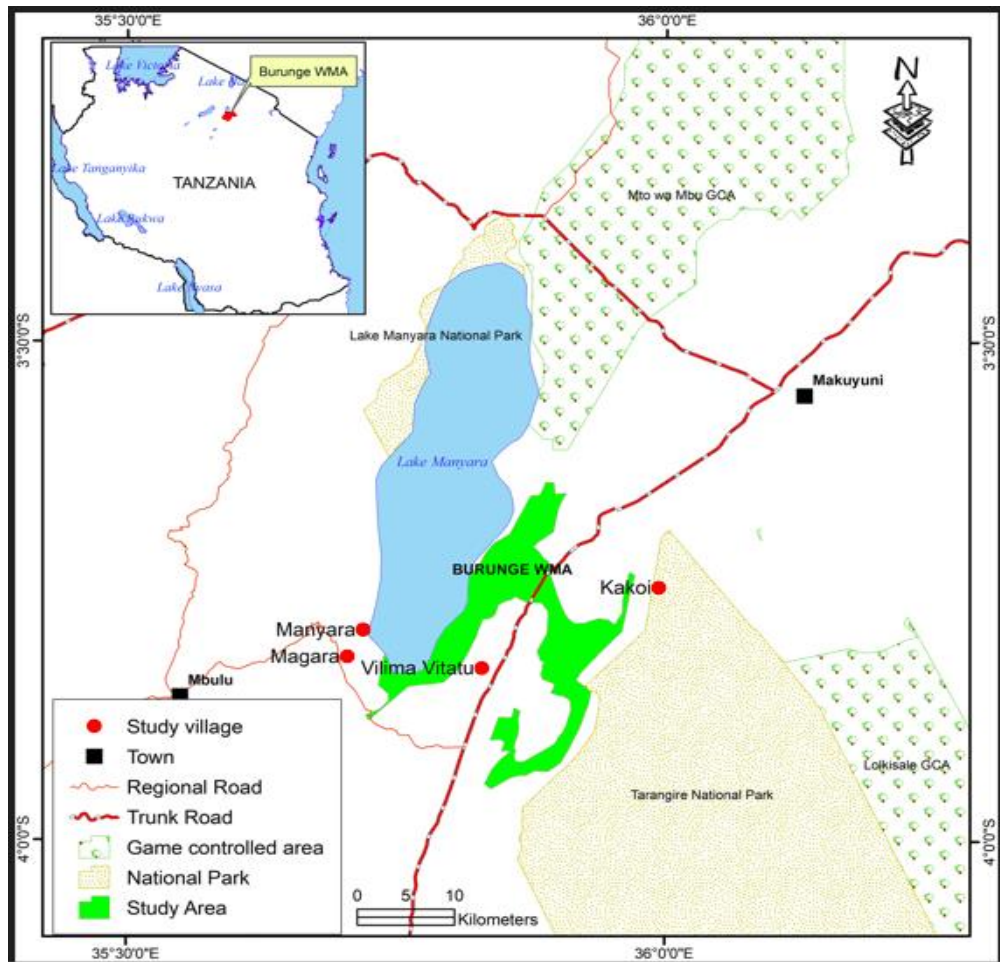


Figure 1: Location of the Burunge WMA. Source: Authors own construction.

We used focus group discussions (FGDs) to collect qualitative data on participants' attitudes and perceptions, knowledge and experiences, and practices. In the FGDs, we separately involved male and female participants. Each group comprised 6 participants (Krueger, 2000) and we conducted 2 FGDs in each of the four villages and hence in total we conducted 8 FGDs. We selected the FGD participants based on their age (i.e., 18 years old and above) and their knowledge of the Swahili language. FGDs allowed for triangulation of the data we collected through other methods., two in each of the four study villages. Each of the groups consisted of 6 participants comprised both males and females. This was

important because each gender has different interests, different access modality to the resources in the Burunge WMA, different understandings of the rules governing the WMA and conservation in general. Similarly, upon securing consent from the participants, we audio-recorded the discussions throughout.

Moreover, we conducted a face-to-face interview through a household survey in the study villages using a semi-structured questionnaire. We used a semi-structured questionnaire having both closed and open-ended questions. We carefully designed the questionnaire ensuring it began with less sensitive questions and ended with sensitive ones and allowed for soliciting and acquiring



in-depth information and evidence from our interviewees (Ruslin *et al.* 2022). To ensure validity and reliability of our questionnaire, we pre-tested it to 20 respondents in Mwada which is one the Burunge WMA villages. We then went over the questionnaires to find out whether the information we expected from our respondents were relevant and would provide adequate answers. This process was important adjusting and improving the questionnaire prior to undertaking our actual fieldwork. We collected the data from the

heads of household (husband or wife) or family members aged 18 and above in cases where the heads of households were not present. At this level, we solicited and captured socio-economic data of heads of households, local community compliance with the conservation regulations, and factors that influenced community's compliance with the regulations governing the Burunge WMA. We present our study respondents and participants in Table 1.

Table 1: Study respondents and participants

Respondents	Category	No	Institution/Location
Key informants	District Council officials	3	Babati District officials
	VEOs	4	Study villages
	PAMS Foundation officials	1	Babati Town
	Lodge officials	1	Vilima Vitatu village
	Burunge AA officials	3	Mwada village
Total KIs		11	
Heads of households (HHs)	Adults (male and female)	101	Vilima vitatu village
		98	Magara village
		89	Manyara village
		68	Kakoi village
Total HHs		356	Study villages
Focus groups	Adults (male and female)	48	Study villages

We determined household sample size using Yamane (1967) sample size calculation formula with a marginal error of 0.05 notably:

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

Where:

- n = the total sample size,
- N = total household number,
- e = the level of precision (acceptable error term [0.05]).

Using the above formula, we obtained a sample size of 356 heads of households. Subsequently, we proportionately sampled our study villages using the following formula:

$$n_h = \frac{N_h}{N} n$$

Where:

- n_h = population sample in village h ,
- N_h = sampling frame in village h
- N = sampling frame in all studied villages, and
- n = the sample size of the study

1. $Vilima\ Vitatu = \frac{908}{3206} \times 356 = 101$
2. $Magara = \frac{885}{3206} \times 356 = 98$
3. $Manyara = \frac{799}{3206} \times 356 = 89$
4. $Kakoi = \frac{614}{3206} \times 356 = 68$

Data analysis

We used SPSS software version 23 as a tool to analyse the quantitative data. We analysed the data obtained through direct questioning technique of the wildlife regulation compliants using descriptive analysis through which we created percentages. Similarly, we used Microsoft Excel to process our data using tables and graphs that we subsequently used in the presentation and discussion of the results.

Additionally, we employed a binary logistic regression model to analyse and explain the influence of predictor's variables; severity of



punishment, probability of detection, and normative factors descriptive norm, compatibility of conservation rules, and participation of respondents in the formulation of rules towards local communities' compliance with conservation rules of Burunge WMA using the following formula:

$$\log_{it}[\pi(x)] = \log\left(\frac{\pi(x)}{1 - \pi(x)}\right) = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

Where:

$\pi(x)$ = the likelihood of being compliant with respective regulation

x_i = are covariates and

β_i = are their respective parameters

The model's findings are reported as an estimated regression parameter and estimated odds ratios (OR). An increase or reduction in the likelihood of compliance for individuals at a certain level of the independent variable as opposed to those in the reference category is shown by the estimated OR, which is obtained by calculating the exponent of the regression parameter estimates. When the estimate of OR exceeds 1, it means respondents have a higher chance of adhering to the rules than members of the reference category do at a given level of the independent variable. In a similar manner, an estimate of OR less than 1 indicates that there is a lower probability of adhering to the rules norms at a given level of the independent variable than that of the reference category.

The study employed a 95% level of significance. As for the qualitative data, we transcribed and uploaded them into NVivo software that facilitated content analysis of data by organizing them into different components of compliance and factors either instrumental or normative factors. Essentially, we analysed the KIs data based on the individual KI transcripts and FGD data using group analysis technique whereby data produced during group discussions were treated as a whole without delineating individual contributions.

RESULTS

Socio-economic characteristics of the respondents

The results in Table 2 shows that the majority (79.2%) of our respondents at the household level were males and the rest (20.8%) were females. Similarly, our results showed that most of the respondents (40.7%) were in the age group of 18-34 years and the rest: 28.1%, 16.3%, and 14.9% belonged to the age groups of 35-45, 45-54 and 55 years and above, respectively. Regarding level of education, our results showed that over half (56.2%) of the respondents had attained primary education. These were followed by respondents with non-formal education accounting for 36.5%. Those who attained secondary education were 6.7% and only 0.6% had attained tertiary education. The results further indicated that a significant proportion (87.9%) of our respondents were married and a few (7.3%, 4.5%, 0.2%, 0.1%) were single, widowed, divorced and separated, respectively. As for the family size, our results showed that majority (52.5%) of respondents had larger family size of 6 and above and the rest (47.5%) had small family size of one to five members.

In terms of respondents' occupations, our results revealed that majority of the respondents (59.5%) were engaged in crop farming while 15.3% were engaged in livestock keeping. About 7.8% of the respondents engaged in fishing, petty trading was reported by 9.5% of the respondents while about 7.9% of the respondents were formal employees working as teachers, nurses and game officers just to mention a few.

The status of local communities' compliance to regulations

Our results showed that the majority (77.5%) of the respondents complied with the wildlife regulations governing the Burunge WMA. The rest (22.5%) of the respondents reported not to comply. Those who did not comply were involved in illegal activities in the WMA including tree cutting (38.2%),



livestock grazing (25.6%), illegal fishing (22.1%) farming encroachment (7.1%) and charcoal making (7%) as presented in Figure 2.

Table 2: Socio-economic characteristics of the respondents

Variable	Frequency (n =356)	Percent (%)	
Sex	Males	282	79.2
	Females	74	20.8
Subtotal		356	100
Age	18-34	145	40.7
	35-44	100	28.1
	45-54	58	16.3
	55 and above	53	14.9
Subtotal		356	100
Marital status	Single	26.0	7.3
	Married	312.9	87.9
	Widowed	16.0	4.5
	Divorced	0.7	0.2
	Separated	0.4	0.1
Subtotal		356	100
Education level	Non-formal education	130	36.5
	Primary education	200	56.2
	Secondary education	24	6.7
	Tertiary education	2	0.6
Subtotal		356	100
Family size	1-5 household members	169	47.5
	6-above	187	52.5
Subtotal		356	100
Occupation	Crop farming	212	59.5
	Livestock keeping	54	15.3
	Fishing	28	7.8
	Petty trading	34	9.5
	Formal employment	28	7.9
Subtotal		356	100

Source: Constructed from field data

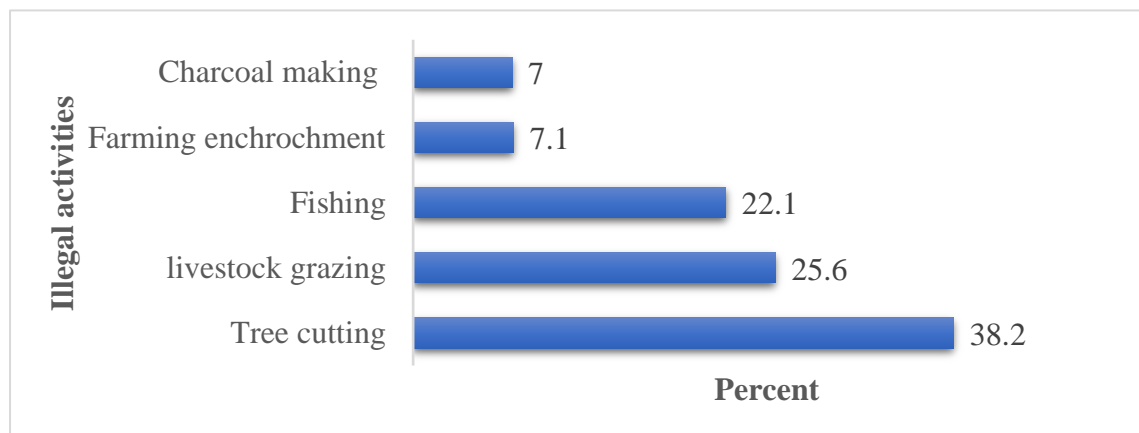


Figure 2: Respondents' direct report of engagement in illegal activities. Source: Field data

Factors influencing local communities' compliance with Burunge conservation revaluations

The factors that we examined include severity of punishment, probability of detection, descriptive norms implying

individual's perception that majority of the people in the community comply with the wildlife regulations. And also, participation in the formulation of wildlife conservation regulations. We present the results from our analysis in Table 3.



Table 3: Binary logistic analysis of factors influencing compliance behaviour (n = 356)

Predictor Variables	WMA Regulations		By-laws		Fisheries Regulations	
	OR	P-value	OR	P-value	OR	P-value
Instrumental factors						
Severity of punishment						
High	1.57	0.718	0.92	0.803	0.62	0.242
Low (reference)						
Probability of detection						
High	0.47	0.025	3.85	0.000	0.92	0.001
Low (reference)						
Normative Factors						
Compatibility						
Agree	0.21	0.000	0.45	0.052	2.27	0.016
Disagree (reference)						
Participation						
Yes	0.22	0.000	0.62	0.141	0.57	0.511
No (reference)						
Descriptive norm						
Yes	6.88	0.000	8.62	0.000	1.02	0.959
No (reference)						

Note: OR stands for odd ratio. **Source:** Field data

Severity of punishment and compliance

Analysis on binary logistic regression model indicated that, overall severe punishment had no significant influence on communities' compliance with the three wildlife regulations (i.e., WMA regulations, Village by-laws and fisheries regulations) (Table 3, P-values). However, probability of adherence to individual regulations indicated that, communities were more likely to comply with WMA regulations when severe punishment are imposed (1.57 odd ratio, Table 3). This was contrary to the compliance with village by-laws (0.92 odd ratio) and fisheries regulations (0.62 odd ratio) (Table 3).

Probability of detection and compliance

The results of the binary logistic regression model indicated that the overall probability of being detected had a significant influence on communities' compliance with the three wildlife regulations (i.e., WMA regulations, village by-laws, and fisheries regulations) (Table 3, P-values). The influence was significantly high in compliance with village by-laws (P = 0.000) and fisheries regulations (P = 0.001). However, the likelihood of communities complying with WMA regulations and fisheries regulations due to the probability of detection was low (0.47 odd ratio and 0.92 odd ratio, respectively) (Table 3).

This was contrary to the compliance of village by-laws, where communities were willing to comply with by-laws due to the probability of detection (3.85 odd ratio) (Table 3).

Compatibility of the rules with societal practices and compliance

The model showed that overall compatibility with wildlife regulations had a significant influence on communities' compliance with two regulations (i.e., WMAs regulations and fisheries regulations, P=0.000 and P=0.16 respectively), but not with village by-laws (P=0.052, Table 3). The influence was significantly high with respect to compliance with WMAs regulations (P = 0.000). However, the probability of compliance with specific regulations revealed that, communities were more likely to adhere to fisheries regulations when the regulations were compatible with societal practices (2.27 odd ratio, Table 3). This was in contravention of WMA regulations (0.21 odd ratio) and village bylaws (0.45 odd ratio) (Table 3).

Participation in formulation of the regulations and compliance

The results of the binary regression model in Table 3 show that the factor had a highly significant statistical influence on WMAs regulations (P = 0.000), but no significant



influence on communities' adherence to village by-laws ($P = 0.141$), and fisheries regulations ($P = 0.511$). However, the likelihood of adherence to each wildlife regulation indicated that individuals were less likely to adhere to each wildlife regulation (0.22 odd ratio, 0.62 odd ratio and 0.57 odd ratio for WMAs regulations, village by-laws and fisheries regulations, respectively, Table 3).

Descriptive norm and compliance

As Table 3 indicates, the logistic regression analysis revealed that the descriptive norm had a strong statistical influence on individual's compliance with WMAs regulations ($P = 0.000$) and village by-laws ($P = 0.000$), whereas there was no statistical influence on compliance with fisheries regulations ($P = 0.959$). Concerning likelihood of compliance, results show that communities were more likely to comply with all three regulations if the majority of local communities adhered to the specific regulation (6.88 odd ratio, 8.62 odd ratio, and 1.02 odd ratio for WMAs regulations, village by-laws, and fisheries regulations, respectively; Table 3).

DISCUSSION

Wildlife conservation regulations often suffer from high rates of non-compliance (Fairbrass *et al.* 2016). The understanding of the community compliance to wildlife conservation regulations and their contributing factors is crucially important. This knowledge is however, scanty in the Tanzanian context. Results from our study demonstrates that the majority of respondents in the study area complied with the wildlife conservation regulations. However, a reasonable percentage (22.5%) of the respondents did not comply with these regulations. Tree cutting, livestock grazing and illegal fishing and farming encroachment were reported to be the predominant illegal activities in the study area. This finding was supported by the findings from key informant interviews that showed that most of the violators were engaged in activities which were contrary to the respective village

by-laws and the fisheries regulations of 2020. The punishment associated with violating the by-laws were perceived to be not as stiff as when one violated the WMA regulations. As a result, the information captured through FGDs and KIIs demonstrated that due to local communities' perception of stiff punishment imposed on violators of the WMA Regulations, majority of the people had adhered to the regulations. As it was captured from one the FGD participants:

*"People are afraid to engage in the hunting of the wild animals in the village because if anyone is arrested engaging in this activity is severely punished something, we do not allow to happen to us"*¹

Our findings revealed that factors influencing compliance notably; severity of punishment and probability of detection, roles of participation in regulations formulation process, compatibility of the regulations with the societal' practices, and descriptive norm have different effects on local communities' compliance with the regulations guiding wildlife resources of Burunge WMA. However, based on the Odd ratio, the results suggest severe punishment had cultivated fear among community members to avoid monetary penalties and imprisonment when apprehended while engaging in illegal hunting activities. This revelation was strongly supported during FGDs and KIIs when the participants remarked that the foregoing factors were among the leading factors towards compliance with the WMA regulations. WMA regulations had severe punishment compared to other regulations. For instance, section 64 (b) of the WMA regulations states that violators engaged in illegal hunting of wild animals would be fined two million Tanzanian shillings (USD 893)² or imprisonment for a term of two years, or both. Such cases were reported during our

¹ A reaction from a male participant during an FGD at Vilima vitatu village

² 1USD = TZS 22,407, February, 2018



study. To substantiate this finding an example was reported that in 2017 a resident of Magara village was imprisoned for twenty years for killing twenty flamingos, equivalent to one year per one flamingo. The foregoing observations are supported by previous studies asserting that people are likely to comply if they perceive high punishment and especially when violators are apprehended (Eggert and Lokina 2010, Mayer *et al.* 2014, Oyanedel *et al.* 2020).

Based on our study, the positive influence of probability of detection on local communities' compliance with the by-laws means that there are high regulations enforcement efforts in the conservation of the Burunge WMA's wildlife resources, which has compelled local communities to adhere to the regulations. This could be attributed to the fact that each village adjacent to the Burunge WMA contributes three native VGSs to protect the WMA. The VGS collaborates with local government officials to enforce the regulations. On the other hand, probability of detection negatively influenced local communities' compliance with WMA regulations and fisheries regulations. The findings were not in agreement with previous studies by Mayer *et al.* (2014), Eggert and Lokina (2010), Karper and Lopes (2014) who reported that communities' perception of high probability of detection of the violators of conservation rules motivated people to comply with the regulations governing conservation of wildlife resources. However, this result was in divergence with reactions that disclosed that, despite the presence of VGSs among the local community members, some of the locals have developed detection avoidance tactics. For example, some community members engaged in illegal activities within the Burunge WMA while having a legal permission to use the WMA's resources, making it difficult for patrol teams to detect

their acts. This was substantiated by one FGD participant when she remarked:

*"People apply for permits to collect firewood inside the Burunge WMA but when they enter in the reserve, they cut down trees which is an illegal act. They thus, take the trees home where they produce charcoal. They do this to avoid detection and arrest"*³

The foregoing quote from a participant in an FGD represents pressure and challenges on managing the Burunge WMA by the surrounding community members in an attempt to respond to their pressing needs that help them to make ends meet. So, the probability of detection to negatively influence local communities' compliance with WMA and fisheries regulations could be attributed to the fact that violators have developed detection avoidance techniques. For instance, violators of WMA Regulations developed detection avoidance techniques such as hiding in thick forest and colluding with game securities with the VGSs. This situation is also similar to the one reported in Serengeti National Park (Matungwa and Wawa, 2021) that poachers were using strategies to avoid being apprehended. Development of the avoidance techniques by the violators of the wildlife conservation regulations was echoed during one of the FGDs in the study area:

*"Despite the enhanced law enforcement, unlawful hunting like other criminal activities such as illicit drug trafficking, will continue unabated since poachers conspire with the VGSs to carry out illegal hunting. How comes near their camp, there are many illegal hunting incidences. This suggests the involvement of the VGSs in these activities"*⁴

Normative factors that include compatibility of the rules to the societal practices,

³ Response from a female participant during FGD at Kakoi village

⁴ A reaction from a male participant during FGD at Vilima vitatu village



participation in the formulation of regulations and descriptive norm, also had influence on the compliance behaviour of local communities with wildlife conservation regulations. People comply with the regulations when they perceive that the regulations are compatible to their societal practices (Arias 2015). Compatibility of the regulations in particular, there was a correlation between the factor and the compliance behaviour with WMA regulations and fisheries regulations. Local communities who perceived that fisheries regulations were compatible to their societal practices were more likely to comply with the regulations. This finding was in line with Eggert and Lokina (2010) whose study revealed that fishers had high chance of likelihood of compliance with the fisheries rule because with introduction of the fisheries regulations, the government continued to allow them to practice fishing activities in Lake Victoria. In our study, the likely explanation behind the motive was that local communities were allowed to continue to practice the fishing activity conducted prior the establishment of WMA. Villagers in Manyara and Vilima Vitatu appreciated the activity because of its people's livelihood improvement. Thus, the impact to comply with the regulations governing the WMA was observed to have impact as underscored by one of the village leaders in the study area:

“With the inclusion of our village's part of Lake Manyara in Burunge WMA, local community members are allowed by the Fisheries Act of 2003 and the 2020 Regulations to practice fishing in lake Burunge and lake Manyara. This is an activity that has been playing a pivotal role in improving local community livelihood even before establishment of the WMA. The permission to let local people continue with this activity has acted as

a motivation towards compliance with Fisheries Regulations”⁵

On the contrary, the factor motivated people to engage in non-compliance with the WMA regulations. The finding is in line with Nielsen and Meilby (2013) finding in the Udzungwa Mountains in Tanzania where people engaged in illegal hunting because of poverty. Similarly, in the current study, results indicated that people are also compelled to violate wildlife conservation regulations because of poverty. The community members, especially the Barbaig pastoralists colluded with outsider poachers to violate the WMA regulations by killing the wild animals in order to get income to fulfil their household needs. For instance, it was reported that in 2017, a pastoralist was arrested for the possession of two ivories. This state of affairs suggested that despite the compatibility of the wildlife regulations to the society, there was a need to devise and adopt strategies that could reduce poverty to the people adjacent to the protected areas including the Burunge WMA.

Local communities are likely to comply with the regulations when they participate in the process of formulating regulations (Tegegne *et al.* 2022). Results from this study showed that community members participated in the formulation of WMA regulations and fisheries regulations. However, they were less likely to comply with the regulations than those who did not participate in the process. Basically, the likelihood of non-compliance regardless of their participation in the formulation of the guidelines could be attributed to the quality of participation of local communities in the regulation's formulation process. During FGDs, participants frequently reported poor participation in the WMA regulations as one of participant reverberated:

“The majority of the of community members lacked details about establishment of the WMA as they

⁵ Response as captured from the VEO of Manyara village



were informed by the WMA proponents that the process was just a pilot. Only prominent people in the community were better informed about the process and had a chance to participate in the establishment of the WMA. The WMA therefore, was established without our consent as villagers. As a result, we only came to know fully about the WMA regulations when it had already been established”⁶

The above remark from an FGD participant represents poor participation of community in making decisions related to the establishment of the WMA. This could significantly affect their livelihoods and compliance to regulations governing the Burunge wildlife resources. It may as well trigger lack of ownership of this natural capital and eventually compromise the sustainability of its management. This observation is supported by other studies such as Chirenje *et al.* (2013) who note that often communities are seen to be more involved in the implementation of natural resource management programs but lack ownership of the projects as they are not part and parcel of the planning and budgeting which are crucial elements in decision-making. The finding was also in line with other studies (e.g., Veiga *et al.* 2013) that showed that natural resources managers did not effectively involve resource users in the formulation of new wildlife regulations.

The importance of the descriptive norm on local communities’ compliance behaviour with conservation regulations, was relevant. The results showed that there was a positive relationship between the factor and compliance behaviour with the regulations, meaning that as perception of majority of people in the society’s compliance with the regulations increases, compliance behaviour of the communities also increase. The results suggest the stabilization of regulations

⁶ A reaction from a male participant during FGD at Vilima vitatu village

adherence in the society. The findings also resonate a previous study by Thomas *et al.* (2016) which showed that social pressure influenced people compliance with the hunting regulations. In this study, the situation was probably because of the monetary benefits the villages received annually from the Burunge WMA authority. For instance, in the 2017/2018 financial year, villages making up the Burunge WMA received about 63 million Tanzania Shillings (USD 28,116) each. Respondents reported that the revenue was invested in the respective village development projects such as construction and repair of health centres, schools and bridges. This suggested that the community members were more likely to comply with the wildlife regulations as substantiated by one of the KIs:

“In the financial year 2017/18, like others, Magara village received 63 million Tanzanian shillings from the Burunge WMA authority. The fund supported village development projects including construction of primary and secondary schools, construction of a health centre and a village government office. The good news is that construction of these development projects has motivated local community members to comply with the regulations governing the Burunge WMA”⁷

CONCLUSIONS AND RECOMMENDATIONS

In this study we found that the majority (77.5%) of respondents adhered to Burunge WMA’s conservation regulations while 22.5% did not comply with the regulations. The study revealed that both instrumental and normative factors played a great role in influencing compliance behaviour of the local communities. However, the normative factors mostly had a negative relationship with compliance behaviour. This means the

⁷ A reaction captured from the Magara Village Executive Officer



conservation norms of the communities have deteriorated following the establishment of the Burunge WMA. Although the study found violators of conservation regulations to be less than a quarter of the respondents, the number cannot be ignored. Our study also disclosed that the communities adjacent to Burunge WMA benefited in some ways including receiving funds that supports community development projects. However, the quality of community participation in decisions related to the establishment and running of the WMA and its relevant regulations was evidently poor. This situation denoted lack of community ownership of the WMA and has implications on sustainable management of wildlife resources.

Based on these findings, the following are our recommendations:

- Government through the Ministry of Natural Resources and Tourism and particularly the Wildlife Division should enhance collaboration with the local government to ensure local communities' voluntary compliance with the wildlife regulations is achieved. This can be facilitated through investing in uplifting normative compliance of the society by ensuring conservation regulations are compatible to society's practices and descriptive norms favour compliance with the regulations.
- Ensure effective community participation in making decisions related to the management of the Burunge WMA. This should entail improvement of the benefits to the community that emanates from the WMA. This may incite a sense of community ownership of the WMA and ensure its sustainability.

REFERENCES

Ajzen, I. 1991. The Theory of Planned Behaviour. *Organizational Behaviour and Human Decision Processes*, 50 (2), 179-211.

- Arias, A. 2015. Understanding and managing compliance in the nature conservation context. *Journal of environmental management*, 153: 134-143.
- Becker, G.S. 1968. Crime and punishment: An economic approach. In *The economic dimensions of crime* (13-68). Palgrave Macmillan, London.
- Benjaminsen, T.A., Goldman, M.J., Minwary, M.Y. & Maganga, F.P. 2013. Wildlife management in Tanzania: state control, rent seeking and community resistance. *Development and change*, 44(5), 1087-1109.
- Bisack K.D. & Das, C. 2015. Understanding non-compliance with protected species Regulations in the Northeast USA gillnet fishery. *Front Mar Sci* 2, 91. Doi: [10.3389/fmars.2015.00091](https://doi.org/10.3389/fmars.2015.00091)
- Bluwstein, J. 2018. From colonial fortresses to neoliberal landscapes in Northern Tanzania: A biopolitical ecology of wildlife conservation. *Journal of Political Ecology*, 25(1), pp.144-168.
- Bluwstein, J., Lund, J.F., Askew, K., Stein, K., Noe, C., Odgaard, R., Maganga, F. & Engström, L. 2018. Between dependence and deprivation: the interlocking nature of land alienation in Tanzania. *Journal of Agrarian Change*, 18(4), 806-830.
- Bluwstein, J., Moyo, F. & Kicheleri, R. 2016. Austere conservation: understanding conflicts over resource governance in Tanzanian Wildlife Management Areas. *Conservation and Society*, 14(3), 218-231.
- Chirenje, L.I., Giliba, R.A. & Musamba, E.B. 2013. Local Communities' Participation in Decision Making Processes through Planning and Budgeting in African Countries. *Chinese Journal of Population Resources and Environment*, 11(1), 10-16. <http://dx.doi.org/10.1080/10042857.2013.777198>



- Cialdini, R.B. 2007. Descriptive social norms as underappreciated sources of social control. *Psychometrika*, 72(2), 263-268.
- Cockerill, K. & Hagerman, S. 2020. Historical insights for understanding the emergence of community-based conservation in Kenya: international agendas, colonial legacies, and contested worldviews. *Ecology and Society*, 25(2).
- Davis, E.O., Crudge, B., Lim, T., O'Connor, D., Roth, V., Hunt, M. & Glikman, J.A. 2019. Understanding the prevalence of bear part consumption in Cambodia: A comparison of specialised questioning techniques. *PLoS One*, 14(2), e0211544.
- Eggert, H. & Lokina, R. 2010. Regulatory in Lake Victoria fisheries. *Environment and Development Economics*, 1-21.
- Fairbrass, A., Nuno, A., Bunnefeld, N. & Milner-Gulland, E.J. 2016. Investigating determinants of compliance with wildlife protection laws: bird persecution in Portugal. *European Journal of Wildlife Research*, 62: 93–101
- Hatcher, A., Jaffry, S., Thébaud, O. & Bennett, E. 2000. Normative and social influences affecting compliance with fishery Regulations. *Land Economics*, 448-461.
- Hu, H., Zhang, J., Chu, G., Yang, J., & Yu, P. 2018. Factors influencing tourists' litter management behaviour in mountainous tourism areas in China. *Waste Management*, 79, 273-286.
- Karper, M.A.M. & Lopez, P.F.M. 2014. Punishment and compliance: Exploring scenarios to improve the legitimacy of small-scale fisheries management rules on the Brazilian coast. *Marine Policy*, 44: 457-464.
- Kengera, Z. 2016. The politics of participation, benefit sharing and conflicts in the Burunge Wildlife Management area, in Babati District, Tanzania (Unpublished Doctoral Thesis). University of Dar es Salaam. Dar es Salaam.
- Kicheleri, R.P., Treue, T., Nielsen, M.R., Kajembe, G.C. & Mombo, F.M. 2018. Institutional rhetoric versus local reality: A case study of Burunge wildlife management area, Tanzania. *SAGE Open*, 8(2), 2158244018774382.
- Kideghesho, J.R. 2008, July. Who pays for wildlife conservation in Tanzania and who benefits? In Proceedings of the 12th Biennial Conference of the International Association of the Study of the Commons, Cheltenham, UK (14-18).
- Krueger, R.A. & Casey, M.A. 2000. *Focus groups: A practical guide for applied researchers* (3rd ed.). Thousand Oaks, CA: Sage.
- Lee, D.E. 2018. Evaluating conservation effectiveness in a Tanzanian community wildlife management area. *Journal of Wildlife Management*, 82, 1767– 1774.
- Mayer, J.E., King, T L., Birenda K.C., Will, B. & Peterson, M.N. 2014. Evaluating poaching deterrence in the Southeast. *Journal of the Southern Association of Fish and Wildlife Agencies*, 1,146-149.
- Moyo, F., Funk, S. & Pretzsch, J. 2017. Between policy intent and practice: Negotiating access to land and other resources in Tanzania's wildlife management areas. *Tropical Conservation Science*, 10, 1-17.
- Nelson, F., Nshala, R. & Rodgers, W.A. (2007). The Evolution and Reform of Tanzania Wildlife Management. *Conservation and Society*, 5, 232– 261.
- Nielsen, M.R. & Meilby, H. 2013. Determinants of compliance with hunting regulations under Joint Forest Management in Tanzania. *South African Journal of Wildlife*



- Research-24-month delayed open access, 43(2), 120-137.
- Noe, C., Brockington, D., John, R., Bwagalilo, F. & Kamnde, K. 2019. Interrogating wildlife conservation partnerships in Rufiji and Kilwa districts, Tanzania: Context, process and sustainability outcomes (No. 2019/2). NEPSUS Working Paper.
- Nuno, A. & John, F.A.S. 2015. How to ask sensitive questions in conservation: A review of specialized questioning techniques. *Biological Conservation*, 189, 5-15.
- Nuno, A.N.A., Bunnefeld, N., Naiman, L.C. & Milner-Gulland, E.J. 2013. A novel approach to assessing the prevalence and drivers of illegal bushmeat hunting in the Serengeti. *Conservation Biology*, 27(6), 1355-1365.
- Ogutu, J.O., Owen-Smith, N., Piepho, H.P. & Said, M.Y. 2011. Continuing wildlife population declines and range contraction in the Mara region of Kenya during 1977–2009. *Journal of Zoology*, 285(2), pp.99-109.
- Oyanedel, R., Gelcich, S. & Milner-Gulland, E.J. 2020. A synthesis of (non-) compliance theories with applications to small-scale fisheries research and practice. *Fish and Fisheries*, 21(6), 1120-1134
- Parker, I. & Bleazard, S. (Eds.). 2001. An impossible dream. Kinloss, Scotland: Librario.
- Rai, N.D., Devy, M.S., Ganesh, T., Ganesan, R., Setty, S.R., Hiremath, A.J., Khaling, S. & Rajan, P.D., 2021. Beyond fortress conservation: The long-term integration of natural and social science research for an inclusive conservation practice in India. *Biological Conservation*, 254, p.108888.
- Rivis, A. & Sheeran, P. 2003. Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current psychology*, 22(3), 218-233.
- Ruslin, Mashuri, S., Abdul-Rasak, M.S., Alhabsyi., & Syam, H. (2022). Semi-structured Interview: A Methodological Reflection on the Development of a Qualitative Research Instrument in Educational Studies. *IOSR Journal of Research & Method in Education*, 12(1).
- Shemwetta, D.T.K. & Wilfred, P. 2010. Towards sustainable use of Wildlife Management Areas (WMAs) in Tanzania: possibilities and problems. *Tanzania Journal of Forestry and Nature Conservation*, 80(2), 88-100.
- Shoo, R.A., Mtui, E.K., Kimaro, J.M., Kinabo, N.R., Lendii, G.J., & Kideghesho, J.R. 2021. Wildlife Management Areas in Tanzania: Vulnerability and Survival Amidst COVID-19. *Managing Wildlife in a Changing World*, 97.
- St John, F.A., Edwards-Jones, G. & Jones, J.P. 2010. Conservation and human behaviour: lessons from social psychology. *Wildlife Research*, 37(8), 658-667.
- St John, F.A.V. 2012. Assessing and sentencing illegal behaviours in conservation. A PhD thesis submitted to School of Environment, Natural Science and Geography Bangor University.
- St John, F.A.V. 2012. Assessing and sentencing illegal behaviours in conservation. A PhD thesis submitted to School of Environment, Natural Science and Geography Bangor University.
- Tegegne, Y.T., Ramcilovic-Suominen, S., Kotilainen, J., Winkel, G., Haywood, A. & Almaw, A. 2022. What drives forest rule compliance behaviour in the Congo Basin? A study of local communities in Cameroon. *Land Use Policy*, 115, p.106012.



- Thomas, A.S., Milfont, T.L. & Gavin, M.C. 2016. A new approach to identifying the drivers of regulation compliance using multivariate behavioural models. *PLoS ONE*, 11(10): e0163868.
doi:10.1371/journal.pone.0163868
- URT, 2009. Wildlife Conservation Act 2009. Ministry of natural Resources and Tourism. Dar es Salaam.
- URT. 1998. Wildlife Conservation Policy. Ministry of Natural Resources and Tourism.
- Veiga, P., Pita, C., Leite, L., Ribeiro, J., Ditton, R.B., Gonçalves, J.M.S. & Erzini, K. 2013. From a traditionally open access fishery to modern restrictions: Portuguese anglers' perceptions about newly implemented recreational fishing Regulations. *Marine policy*, 40, 53-63.
- Yamane, T. 1967. *Statistics: An Introductory Analysis*, 2nd Edition, New York: Harper and Row.