



## EXPLORING COMMUNITY SATISFACTION IN PARK MANAGEMENT: INSIGHTS FROM PROTECTED AREAS IN MYANMAR

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### ABSTRACT

Positive relations between local people and protected and conserved area (PA) authorities are important for effective and equitable conservation. Such relations, however, are often strained. Therefore, in this study we explore the heterogeneity in satisfaction in park management amongst people living near to five PAs in Myanmar. Specifically, we examined how a diverse set of predictor variables relate to satisfaction in park management. Of all respondents, 2 per cent perceived park management to be very poor, 17 per cent considered it poor, 73 per cent considered it good, and 8 per cent considered it very good. Level of satisfaction in community involvement in conservation associated most strongly with satisfaction in park management, followed by satisfaction in community benefits from conservation activities. The extent to which park management and rangers were seen to treat communities with respect both related strongly and positively to level of satisfaction in park management. Experience of human–wildlife conflict had a negative association with satisfaction in park management. Finally, perceived alignment between conservation regulations and community values had a positive relationship with satisfaction in park management. Our findings highlight the importance of community involvement in and benefit from conservation activities in Myanmar, as well as the significance of park rangers and overall management treating local communities with respect.

**Key words:** wildlife, ranger, conservation, communities

### INTRODUCTION

Protected areas across the world are increasingly expected to achieve a diverse set of conservation, social and economic objectives (Le Saout et al., 2013; Watson et al., 2014; West et al., 2006). Aichi Target 11 of the Convention on Biological Diversity exemplifies this expectation by encouraging the effective and equitable management of PAs (CBD, 2010). Positive relationships between PAs and local people, which can be incentivised and assisted by explicit inclusion of positive park–people relations in PA management plans, are an important component of effective and equitable protected area management.

Park–people relations can be explored from various perspectives. A wealth of previous research shows that

general attitudes towards PAs can be heterogeneous amongst local people, with attitudes often shaped by demographic traits and personal experiences of benefits and disbenefits from respective PAs (Anthony, 2007; Fiallo & Jacobsen, 1995; Infield & Namara, 2001; Parker et al., 2022; Shibia, 2010). A related but more specific entry point for examining park–people relationships is the attitudes of local community members towards the authorities responsible for managing PAs, namely rangers and park management (Allendorf et al., 2012).

Attitudes amongst local communities towards park authorities can be diverse and complex and may not always be aligned with other dimensions of park–people relations. In Myanmar, for instance, Allendorf et al. (2006) report that even community members with

positive conservation attitudes may conflict with PA management activities like the reclamation of PA land from local communities and punishment for the illegal extraction of natural resources. Studies in India, Nepal and South Africa have similarly found that whilst local residents tend to hold positive attitudes towards PAs, they have negative opinions of park authorities (Allendorf et al., 2007; Anthony, 2007; Karanth & Nepal, 2012). Moreover, environmental and human rights abuses committed by rangers can have particularly detrimental impacts on the trust between local people and park authorities (Duffy et al., 2019). Identifying and tackling such abuses (e.g. Carlson, 2015; Mabele, 2016) is thus vitally important for establishing positive relationships between local communities and park authorities and for supporting the rangers to high standards of personal conduct. In addition to park authority conduct, relations between park authorities and local communities are impacted by wider context, for example, the extent to which local people benefit from conservation, as well as various social, cultural and historical factors (Anagnostou et al., 2020; Duffy et al., 2019; Dutta, 2020; Mutanga et al., 2015). In complement to these community-centred studies, research into ranger perspectives highlights that rangers tend to consider strong ranger–community relationships as important but, in some cases, hard to develop and maintain (Allendorf et al., 2007; Belecky et al., 2019; Infield & Namara, 2001; Lepp & Holland, 2006; Moreto et al., 2017; Woodside & Vasseleu, 2021).

Myanmar is situated in one of the most biodiverse regions of Asia (Myers et al., 2000; Wikramanayake et al., 2001). The country contains around 44, predominantly terrestrial, protected areas (PAs) that cover approximately 6 per cent of the country's land area and contain threatened species like Tiger (*Panthera tigris*), Elephant (*Elaphas maximus*) and Gurney's Pitta (*Hydornis gurneyi*) (Aung, 2007; Rao et al., 2002; Shwe et al., 2020). Across Myanmar, local people typically engage with nearby PAs in various ways, for example, via encounters with wildlife and natural resource collection (Aung, 2007; Forest Department, 2015; Instituto Oikos & BANCA, 2011). Inadequate PA funding often impedes the ability of PA authorities to carry out certain activities, including community engagement (Aung, 2007; Myanmar, 2018; Rao et al., 2002). Nevertheless, previous studies on community attitudes towards conservation and PAs in Myanmar indicate that attitudes are usually mixed and, in some cases, tend towards positive (Allendorf et al., 2012; Allendorf et al., 2017; Htay et al., 2022; Htun et al., 2012).

Although studies of park authority and local community relations in Myanmar are more limited than research on general attitudes towards PAs, Allendorf et al. (2006) identify conflicts with park management as one of the most commonly reported negative perceptions by community members living near their three case study PAs in Myanmar. Also, Allendorf et al. (2017) report that evidence-based changes to the management of Chatthin Wildlife Sanctuary led to a decrease in the proportion of local community members that reported conflicts with park management as a negative perception of the park, although it was still stated by almost a third of respondents. Furthermore, WWF's ranger perception survey suggests that relations between park authorities and communities may be tense for certain PAs in Myanmar, as 33 per cent of rangers had experienced verbal abuse in the previous 12 months and 21 per cent had been threatened (Belecky et al., 2019). Also, 40 per cent of the respondent rangers did not think that community members trusted them (Belecky et al., 2019).

In this study, we focused on local community perceptions of park management in five protected areas managed by government across Myanmar using data gathered via structured questionnaires. Our main objective was to enrich our understanding of the factors that shape the heterogeneity in local community satisfaction in park management in these areas. In particular, we aimed to improve our understanding of how factors that closely relate to the actions of park authorities (e.g. knowing rangers, meeting rangers, attending meetings with park authorities, perceived respect from rangers and park authorities), as well as benefits from conservation, experience of human–wildlife conflict, and extent of perceived alignment between conservation rules and regulations and community values, relate to community satisfaction with park management.



Interviewing community member © FOW/WWF

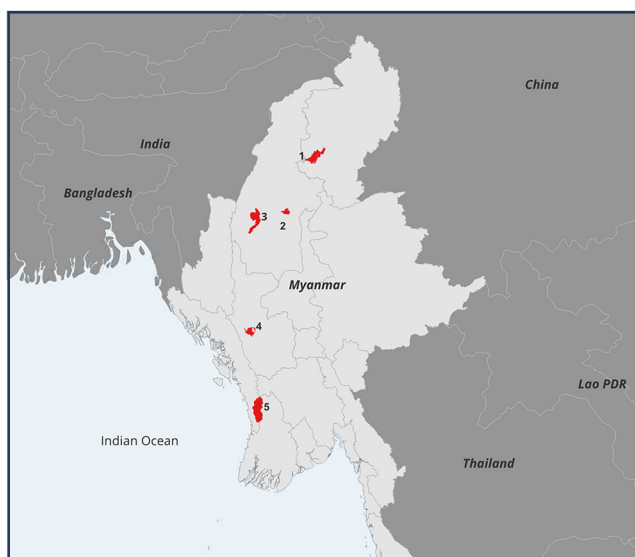
## METHODS

### Study area

Surveys were carried out in 78 villages around five protected areas in Myanmar (Figure 1): Chatthin Wildlife Sanctuary (20 villages), Indawgyi Wildlife Sanctuary (18 villages), Mahamyaing Wildlife Sanctuary (20 villages), Rakhine Yoma Elephant Reserve (18 villages) and Shweseztaw Wildlife Sanctuary (20 villages). These five protected areas were selected so that park–people relations could be explored across a set of protected areas that vary with respect to various characteristics (e.g. management systems, geographies and landscapes, threats faced). This said, local people around each of these sites generally interact with the parks and park management, for instance, through encounters with wildlife and natural resource collection (Instituto Oikos & BANCA, 2011). Local communities around these sites also engage with these parks and park management through various conservation activities, such as the community forestry initiatives (Instituto Oikos & BANCA, 2011). Also, all of these sites have permanently assigned rangers, bar the Mahamyaing Wildlife Sanctuary, where rangers rotate in from nearby parks for around 6 months (P Soe 2021, personal communication).

### Data collection

This study uses data from a community perception survey conducted in 2018 with people living in 78



**Figure 1. Protected areas included in the study: 1. Indawgyi Wildlife Sanctuary (139); 2. Mahamyaing Wildlife Sanctuary (149); 3. Chatthin Wildlife Sanctuary (288); 4. Shweseztaw Wildlife Sanctuary (295); 5. Rakhine Yoma Elephant Range (264). Numbers of responses from each area are given in parentheses.**

villages within 20 km of five protected areas in Myanmar (Figure 1). A distance of 20 km from the parks was selected as it was assumed individuals within this distance are likely to interact with the park in some way (e.g. encounter wildlife, collect resources, meet rangers, attend meetings hosted by park management). Participant selection for the study involved multiple stages: first, in villages in close proximity to selected protected areas, the field team met with the village chair to explain the study objectives. Next, the research team was provided access to the community ledger, which included the list of households, the name of the family head, and additional information on the family (e.g. age, sex, etc.). Third, the field team conducted systematic random sampling to identify households to approach. For each household, the head of the household was included in the study, as well as the spouse (if applicable), and any children over the age of 20. Study participants were informed of the entirely voluntary and anonymous nature of the survey prior to the administration of the survey, as well as of their right to remove themselves at any point. Community perception surveys were conducted by two Friends of Wildlife staff with the support of two local guides, whose presence as local community representatives was in part to make interviewees more comfortable. The responses to the community surveys were collected in three ways: 1) completed individually by the respondent, 2) completed by the respondent individually, but in a group setting with other participants, and 3) one-on-one with a member of the research team in the event that the respondent was illiterate. Respondents completed the surveys in their homes or at a community council office. All completed surveys were kept securely by the Friends of Wildlife staff and specific responses were never disclosed. Once all the surveys had been carried out, the responses were used to populate a password-protected spreadsheet. The password to access this spreadsheet was only given to individuals who needed access to the raw data in order to complete the analyses for this study. This study was approved by the University of Central Florida's Institutional Review Board (SBE-17-13597).

### Data analysis

We constructed an ordinal logistic regression mixed model with satisfaction in park management as the dependent variable. Levels of satisfaction in park management were gauged with the question, "Overall, how satisfied are you with the following? Park management" and had a 4-point Likert-type item ranging from 'Very Poor' to 'Very Good'. Our independent variables included a number of demographic variables and variables related to whether respondents had met rangers or attended meetings





Community discussion about protected areas © Hkun Lat / WWF-Aus

hosted by park authorities, the extent to which rangers and park management were seen to treat communities with respect, level of satisfaction in community involvement in and benefits from conservation, experience of human–wildlife conflict (including crop loss, wildlife depredation, personal harm and harm to a member of the family), and extent to which conservation rules and regulations were seen to align with community values. Details of the variables can be found in Table S1 (supplementary online material) and a priori hypotheses for how each independent variable relates to satisfaction in park management can be found in Table S2 (supplementary online material). The nearby protected areas was treated as a random variable to account for the spatial clustering of respondents. The `clmm` function in the R package ‘ordinal’ (Christensen, 2019) in R version 4.0.0 (R Core Team, 2020) was used to fit the model. All independent variables had acceptably low levels of heteroscedasticity and collinearity with other independent variables. We found no problematic breaches of the proportional odds assumption following both graphical and statistic tests (Liu & Zhang, 2018). The appropriateness of the logit link function was established by comparing QQ plots for

models with different link functions. Average effect sizes on community satisfaction with park management were then calculated for each independent variable that had a significant association with the dependent variable (i.e.  $p < 0.05$ ) in the ordinal regression model. Average effect sizes were calculated as the average of the differences in the effect size between the lowest and highest end of the range of the focal independent variable at every level of satisfaction of park management.

## RESULTS

### *Respondent profiles and perceptions of park authority and community relations*

A total of 1,135 responses were obtained from 78 villages around five protected areas in Myanmar. Eighty-one per cent of respondents were male and 19 per cent female. Mean age of respondents was 46 (SD=12) and 96 per cent were married. Modal and median level of state education, on a scale of 0 (none) to 10 (final year of high school and above), was 4 (44 per cent), the final year of elementary school. A vast majority of respondents worked as farmers (96 per cent). Mean time spent living near to the respective protected area was 46 years (SD=12).

Fifty per cent of respondents had attended at least one meeting hosted by park authorities and 93 per cent agreed or strongly agreed that park management treat communities with respect. Twenty-nine per cent of respondents had met a ranger. In fact, 22 per cent of respondents had a family member or friend that worked as a ranger, and one had been employed as a ranger. The majority of respondents agreed or strongly agreed that rangers treated community members with respect (88 per cent). Fifteen per cent of respondents had heard or witnessed a ranger engaging in misconduct.

Fifty-four per cent of respondents agreed or strongly agreed that they were satisfied with the benefits to local communities from conservation activities. Regarding human–wildlife conflict, 20 per cent of respondents had experienced crop loss, 5 per cent had experienced livestock depredation and 1 per cent had been harmed or had a family member that had been harmed. Twenty-two per cent had experienced at least one of these types of human–wildlife conflict. Sixty-four per cent of respondents agreed or strongly agreed that they were satisfied with the extent of community involvement in conservation. Fifty-seven per cent agreed or strongly agreed that current wildlife laws reflect local community values.

Of the 328 community respondents who had met rangers, the vast majority reported that the ranger had treated them with respect (99 per cent) and listened to their needs and concerns (91 per cent). Similarly, the vast majority thought that the ranger had been polite (96 per cent), helpful (95 per cent) and knowledgeable (95 per cent). Of the 568 community respondents who had attended a meeting hosted by park management, the vast majority agreed or strongly agreed that the meeting provided useful information regarding the

benefits of the conservation area (94 per cent) and local conservation efforts (94 per cent). Additionally, 97 per cent of respondents agreed or strongly agreed that the meeting provided useful information regarding conservation regulations and 88 per cent agreed or strongly agreed that the meeting provided useful information on the work being performed by park rangers and management.

Eighty-one per cent of community respondents considered park management as good or very good. The proportions of local residents who perceived their park management as good or very good were similar for Chatthin Wildlife Sanctuary (82 per cent), Rakhine Yoma Elephant Range (81 per cent), Indawgyi Wildlife Sanctuary (80 per cent) and Shwesettaw Wildlife Sanctuary (79 per cent), but lower for Mahamyain Wildlife Sanctuary (66 per cent). Our ordinal model indicated that various factors associate with satisfaction in park management (Table 1). Regarding park authorities, perceived respect from rangers and park management both had strong, positive relationships with satisfaction in park management. Satisfaction in the level of community benefits from conservation activities had a strong, positive relationship with satisfaction in park management, and experience of human–wildlife conflict had a negative association. Satisfaction in the level of community involvement in conservation activities had a positive relationship with satisfaction in park management. Perceived alignment between conservation regulations and community values had a positive relationship with satisfaction in park management.

Of the factors with associations with community satisfaction in park management (i.e.  $p$ -value  $< 0.05$ ), the variable with the largest association was level of satisfaction in community involvement in conservation

**Table 1. Coefficients, SE and p-values for the ordinal model that examined the associations of various factors with satisfaction in park management. Significance levels are denoted by . for very low (0.1), \* for low (0.05), \*\* for intermediate (0.01) and \*\*\* for high (0.001)**

Variable	Coefficient	SE	P-Value	Significance
Age	0.00	0.01	0.79	
Gender (Male; Baseline: Female)	-0.28	0.18	0.12	
Education (State-Level)	0.10	0.36	0.78	
Rangers Treat Communities with Respect	1.05	0.40	0.01	**
Awareness of Rangers Engaging in Misconduct (No; Baseline: Yes)	0.33	0.25	0.18	
Family or Friend as Ranger	0.11	0.20	0.60	
Met Rangers (Yes; Baseline: No)	-0.26	0.19	0.18	
Park Management Treats Communities with Respect	1.40	0.41	0.00	***
Ever Attended Meeting (Yes; Baseline: No)	0.28	0.16	0.09	.
Experience of Human–Wildlife Conflict	-0.54	0.17	0.00	**
Satisfaction in Community Benefits from Conservation	1.49	0.28	0.00	***
Satisfaction in Community Involvement in Conservation	1.84	0.29	0.00	***
Alignment of Conservation Regulations with Community Values	0.75	0.29	0.01	**

**Table 2. Association sizes for the significant independent variables (i.e. p-value <0.05) across all levels of dependent variable of community satisfaction in park management in the ordinal model**

Variable	Relationship with Satisfaction in Park Management	Association Size
Satisfaction in Community Involvement in Conservation	Positive	0.26
Satisfaction in Community Benefits from Conservation	Positive	0.23
Park Management Treats Communities with Respect	Positive	0.21
Rangers Treat Communities with Respect	Positive	0.11
Alignment of Conservation Regulations with Community Values	Positive	0.09
Experience of Human–Wildlife Conflict	Negative	0.06

activities (Table 2). This was followed by level of satisfaction in the benefits to local communities from conservation activities. Perceived respect from park management and rangers both had notable sizes of association with satisfaction in park management. Alignment of conservation regulations with local community values and experience of human–wildlife conflict had the smallest association sizes.

## DISCUSSION

Our findings identify several factors that appear to associate with satisfaction in park management among local community members, including factors related to the park authorities themselves and factors related to the wider conservation context. Given that previous studies have identified similar variables as key reasons why people might differ in their perceptions of protected areas and protected area authorities (Anthony, 2007; Lepp & Holland, 2006; Moreto et al., 2017; Mutanga et al., 2017; Sirivongs & Tsuchiya, 2012), it is conceivable that the associations identified in our study reflect causative relationships.

First, our results highlight the importance of wider conservation context for community perceptions of park management, as satisfaction in community involvement in conservation and satisfaction in community benefits from conservation had the largest association sizes with satisfaction in park management. These findings reiterate established conservation paradigms of the importance of community involvement and benefits (Aryal et al., 2017; Hacker et al., 2020; Shane & Shane, 2015) and echo the findings of studies that highlight how wider conservation context can affect the relations between park authorities and local communities (Anagnostou et al., 2020; Duffy et al., 2019; Dutta, 2020; Mutanga et al., 2015). In Myanmar, the onus on promoting community involvement and benefit from conservation activities related to protected areas largely lies with authorities at the national level as land tenure and access issues associated with protected areas are handled by the Forest Department of the

Ministry of Natural Resources and Environmental Conservation (P Soe 2021, personal communication). This control of community involvement and benefit at the national level means that a substantial part of relations between park management and local communities may lie beyond the control of park authorities working at the sites.

Our findings also identify positive associations between the perceived extent to which rangers and park management treat communities with respect and satisfaction in park management. These associations reiterate previous studies that stress the importance of rangers and, especially, park management treating local communities with respect for developing and maintaining strong and positive relationships (Allendorf et al., 2007; Lepp & Holland, 2006; Mutanga et al., 2017). Interestingly though, our results did not suggest a strong association between simply having met a ranger or attended a meeting hosted by park authorities and satisfaction in park management; perhaps because meeting a ranger or attending a park meeting could refer to such a diverse set of experiences. Instead, our results indicate that particularly important factors regarding park authorities are whether rangers and park management are perceived to treat communities with respect.

Although brief, we believe that this analysis is useful as it further highlights the importance of communities feeling that park authorities treat them with respect, as well as stresses the importance of the wider context for the quality of park authority and local community relationships. Analogous future research could explore the ideas of this study with more rigour and in greater depth; for instance, by engaging a more representative group of participants (e.g. improved gender balance), using additional potentially relevant variables (e.g. personal dependence on natural resource collection), or utilising qualitative research techniques to examine the more nuanced concepts (e.g. perceived respect from park authorities, and the impacts of having interacted



with rangers or park management in different circumstances). Such research would benefit from engaging both local communities and park authorities to examine perspectives on both sides of these bilateral relationships.

## CONCLUSION

Our brief study suggests that wider conservation context is important for developing positive relationships between local communities and park authorities, for instance via community involvement in conservation activities and community benefits from conservation. As the extent of community involvement and benefit largely rests with authorities at the national level in Myanmar, this factor may well be beyond the control of many park authorities operating in protected areas in the country. Nevertheless, our study also suggests positive relationships for the extent to which rangers and, especially, park management are perceived to respect local communities and satisfaction in park management. Hence, one general way in which rangers and park management might be able to contribute towards developing and maintaining strong relationships with local communities is by treating local people with sufficient respect. As discussed, future, more in-depth, studies could explore these concepts more rigorously and in greater detail and thus further deepen our understanding of the factors that shape relationships between local communities and park management.



Park management staff in field © Marc Hockings

## SUPPLEMENTARY ONLINE MATERIAL

Supplementary tables S1 and S2

## ACKNOWLEDGEMENTS

We thank everyone who participated in the surveys, our research team, and everyone involved in the development of the survey instruments and protocols. In particular, we are grateful to WWF Tigers Alive Initiative who provided financial support for this work due to their interest in enriching our understanding of community perceptions of park authorities, as well as to the other organisations who contributed financially.

## Conflict of Interest/Funding Declaration

There are no conflicts of interests associated with this study. Funding for carrying out this research was provided by WWF International.

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## RESUMEN

Las relaciones positivas entre la población local y las autoridades de las áreas protegidas y conservadas (ACP) son importantes para una conservación eficaz y equitativa. Sin embargo, estas relaciones suelen ser tensas. Por ello, en este estudio exploramos la heterogeneidad de la satisfacción en la gestión de los parques entre las personas que viven cerca de cinco ACP en Myanmar. En concreto, examinamos cómo un conjunto diverso de variables predictoras se relaciona con la satisfacción en la gestión de los parques. De todos los encuestados, el 2% consideraba que la gestión de los parques era muy deficiente, el 17% la consideraba deficiente, el 73% la consideraba buena y el 8% la consideraba muy buena. El nivel de satisfacción en la participación de la comunidad en la conservación se asoció más fuertemente con la satisfacción en la gestión del parque, seguido de la satisfacción en los beneficios de la comunidad de las actividades de conservación. La medida en que la gestión del parque y los guardabosques trataban a las comunidades con respeto se relacionaba fuerte y positivamente con el nivel de satisfacción en la gestión del parque. La experiencia de los conflictos entre los seres humanos y la vida silvestre tenía una asociación negativa con la satisfacción en la gestión del parque. Por último, la percepción de alineación entre las normas de conservación y los valores de la comunidad tenía una relación positiva con la satisfacción en la gestión del parque. Nuestros resultados ponen de manifiesto la importancia de la participación de la comunidad en las actividades de conservación en Myanmar y de los beneficios que éstas reportan, así como la importancia de que los guardaparques y la administración en general traten a las comunidades locales con respeto.

## RÉSUMÉ

Les relations positives entre les populations locales et les autorités responsables des aires protégées et conservées (APC) sont importantes pour une conservation efficace et équitable. Cependant, ces relations sont souvent tendues. Par conséquent, dans cette étude, nous explorons l'hétérogénéité de la satisfaction dans la gestion des parcs parmi les personnes vivant à proximité de cinq APC au Myanmar. Plus précisément, nous avons examiné comment un ensemble diversifié de variables prédictives est lié à la satisfaction dans la gestion des parcs. Sur l'ensemble des personnes interrogées, 2 % ont estimé que la gestion des parcs était très mauvaise, 17 % l'ont jugée mauvaise, 73 % l'ont jugée bonne et 8 % l'ont jugée très bonne. Le niveau de satisfaction de l'implication de la communauté dans la conservation est le plus fortement associé à la satisfaction de la gestion du parc, suivi par la satisfaction des bénéfices communautaires des activités de conservation. La mesure dans laquelle la direction du parc et les gardes forestiers sont perçus comme traitant les communautés avec respect est fortement et positivement liée au niveau de satisfaction dans la gestion du parc. L'expérience de conflits entre l'homme et la faune a une association négative avec la satisfaction dans la gestion des parcs. Enfin, l'alignement perçu entre les règles de conservation et les valeurs de la communauté a une relation positive avec la satisfaction dans la gestion du parc. Nos résultats soulignent l'importance de l'implication de la communauté dans les activités de conservation au Myanmar et les avantages qu'elle en retire, ainsi que l'importance pour les gardes forestiers et la direction générale de traiter les communautés locales avec respect.