**A framework for understanding the contributions of local residents to protected area law enforcement**

William Sharkey, E.J. Milner-Gulland, Pablo Sinovas and Aidan Keane

Supplementary Table 1 illustrates the different elements of the protected area law enforcement system (top) and dimensions of local community involvement (bottom). Developed through discussions with members of staff at Fauna & Flora’s Cambodia Programme, this table offers an example of how the framework could be adapted to examine how dimensions of local community involvement relate to different elements of the enforcement system. The table has been populated as an example to show how external support in the form of training relates specifically to patrol-based monitoring and threat removal. Filling out this table in a workshop setting may help foster constructive dialogue between different stakeholder groups.

|  |
| --- |
| **Enforcement system**[Select all that apply] |
| Community engagement | Detection | Threat removal | Apprehension | Prosecution | Conviction | Sanctioning | Oversight |
| Raise awareness of rules | Visible patrolling | Provide intelligence | Patrol-based monitoring | Monetary fine | Social | Other\* |
| **X****X** |  |  |  |  |  |  |  |  |  |  |  |
| \* Describe ‘other’ forms of sanctioning that apply: [*e.g. prison sentence, community service etc.*] |

|  |
| --- |
| **Dimensions of local community involvement** |
| Nature of local participation[Select all that apply] | Type of external support provided[Select all that apply] | Motivating force for local participation[Select one] | Extent to which local participation is formalised[Select one] |
| Participate in decision-making | Participate in implementing decisions | Financial | Training | Equipment | Other\* | Primarily internally motivated | Primarily externally motivated | Participating formally and receiving remuneration | Participating formally in a voluntary capacity | Participating informally in the eyes of the state |
| **X** |
| \* Describe ‘other’ types of external support provided to local residents: [*e.g. logistical, technical etc.*] |



Supplementary Fig. 1 displays the different elements of the protected area law enforcement system. It offers an example of how perceived importance of specific contributions to protected area law enforcement could be assessed (example rank scale: 1 = low importance; 2 = medium importance; 3 = high importance). Developed through discussions with members of staff at Fauna & Flora’s Cambodia Programme, the figure is illustrative of how the framework may be adapted to support an interim evaluation.

Supplementary Material 1

A bibliography of the community participation (in the context of conservation) literature, a bibliography of the conservation law enforcement literature, and a bibliography of the community policing literature is presented below. Key literature used to inform the development of the framework is highlighted.

***Key literature: Community participation***

Anagnostou, M., Mwedde, G., Roe, D., Smith, R.J., Travers, H. and Baker, J. 2020. Ranger perceptions of the role of local communities in providing actionable information on wildlife crime. *Conservation Science and Practice*. **2**(6), e202.

Cooney, R., Roe, D., Dublin, H., Phelps, J., Wilkie, D., Keane, A., Travers, H., Skinner, D., Challender, D.W.S., Allan, J.R. and Biggs, D. 2017. From Poachers to Protectors: Engaging Local Communities in Solutions to Illegal Wildlife Trade. *Conservation Letters*. **10**(3), pp.367–374.

Roe, D. (ed.). 2015. *Conservation, crime and communities: case studies of efforts to engage local communities in tackling illegal wildlife trade* [Online]. London: IIED. Available from: https://pubs.iied.org/14648iied.

Roe, D. and Booker, F. 2019. Engaging local communities in tackling illegal wildlife trade: A synthesis of approaches and lessons for best practice. *Conservation Science and Practice*. **1**(5), e26.

Turreira-García, N., Meilby, H., Brofeldt, S., Argyriou, D. and Theilade, I. 2018. Who Wants to Save the Forest? Characterizing Community-Led Monitoring in Prey Lang, Cambodia. *Environmental Management*. **61**(6), pp.1019–1030.

Viollaz, J., Rizzolo, J.B., Long, B., Trung, C.T., Kempinski, J., Rawson, B.M., Reynald, D., Quang, H.X., Hien, N.N., Dung, C.T., Huyen, H.T., Dung, N.T.T. and Gore, M.L. 2022. Potential for informal guardianship in community-based wildlife crime prevention: Insights from Vietnam. *Nature Conservation*. **48**, pp.123–147.

Wilkie, D., Painter, M. and Jacob, A. 2016. *Rewards and Risks Associated with Community Engagement in Anti-Poaching and Anti-Trafficking* [Online]. USAID Biodiversity Technical Brief. Available from: https://biodiversitylinks.org/learning-evidence/combating-wildlife-trafficking/evidence/evidence-inbox/rewards-and-risks-associated-with-community-engagement-in-anti-poaching-and-anti-trafficking-research-paper.

Wilson-Holt, O. and Roe, D. 2021. Community-Based Approaches to Tackling Illegal Wildlife Trade—What Works and How Is It Measured? *Frontiers in Conservation Science*. **2**, 765725.

***Key literature: Conservation law enforcement***

Arias, A., Pressey, R.L., Jones, R.E., Álvarez-Romero, J.G. and Cinner, J.E. 2016. Optimizing enforcement and compliance in offshore marine protected areas: a case study from Cocos Island, Costa Rica. *Oryx*. **50**(1), pp.18–26.

Atuo, F.A., Fu, J., O’Connell, T.J., Agida, J.A. and Agaldo, J.A. 2020. Coupling law enforcement and community-based regulations in support of compliance with biodiversity conservation regulations. *Environmental Conservation*. **47**(2), pp.104–112.

Keane, A., Jones, J.P.G., Edwards-Jones, G. and Milner-Gulland, E.J. 2008. The sleeping policeman: understanding issues of enforcement and compliance in conservation. *Animal Conservation*. **11**(2), pp.75–82.

Moreto, W.D. and Charlton, R. 2021. Rangers can’t be with every elephant: assessing rangers’ perceptions of a community, problem-solving policing model for protected areas. *Oryx*. **55**(1), pp.89–98.

Rizzolo, J.B., Gore, M.L., Long, B., Trung, C.T., Kempinski, J., Rawson, B., Huyẽn, H.T. and Viollaz, J. 2021. Protected Area Rangers as Cultural Brokers? Implications for Wildlife Crime Prevention in Viet Nam. *Frontiers in Conservation Science*. **2**, 698731.

Robinson, E.J.Z., Kumar, A.M. and Albers, H.J. 2010. Protecting Developing Countries’ Forests: Enforcement in Theory and Practice. *Journal of Natural Resources Policy Research*. **2**(1), pp.25–38.

***Bibliography of the community participation literature***

Alpízar, M.A.Q. 2006. Participation and fisheries management in Costa Rica: From theory to practice. *Marine Policy*. **30**(6), pp.641–650.

Andrade, G. and Rhodes, J. 2012. Protected Areas and Local Communities: an Inevitable Partnership toward Successful Conservation Strategies? *Ecology and Society*. **17**(4).

Andrianandrasana, H.T., Randriamahefasoa, J., Durbin, J., Lewis, R.E. and Ratsimbazafy, J.H. 2005. Participatory Ecological Monitoring of the Alaotra Wetlands in Madagascar. *Biodiversity & Conservation*. **14**(11), pp.2757–2774.

Anthony, B. 2007. The dual nature of parks: attitudes of neighbouring communities towards Kruger National Park, South Africa. *Environmental Conservation*. **34**(3), pp.236–245.

Arnstein, S.R. 1969. A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*. **35**(4), pp.216–224.

Aslin, H.J. and Brown, V.A. 2004. *Towards whole of community engagement: a practical toolkit* [Online]. Murray-Darling Basin Commission. Available from: http://hdl.handle.net/1885/77450.

Ayivor, J.S., Nyametso, J.K. and Ayivor, S. 2020. Protected Area Governance and Its Influence on Local Perceptions, Attitudes and Collaboration. *Land*. **9**(9), 310.

Baddianaah, I. and Baaweh, L. 2021. The prospects of community-based natural resource management in Ghana: A case study of Zukpiri community resource management area. *Heliyon*. **7**(10), e08187.

Baker-Médard, M., Gantt, C. and White, E.R. 2021. Classed conservation: Socio-economic drivers of participation in marine resource management. *Environmental Science & Policy*. **124**, pp.156–162.

Baral, N. and Stern, M.J. 2010. Looking back and looking ahead: local empowerment and governance in the Annapurna Conservation Area, Nepal. *Environmental Conservation*. **37**(1), pp.54–63.

Beaumont, J. 1997. Community participation in the establishment and management of marine protected areas: a review of selected international experience. *South African Journal of Marine Science*. **18**(1), pp.333–340.

Berkes, F. 2007. Community-based conservation in a globalized world. *Proceedings of the National Academy of Sciences*. **104**(39), pp.15188–15193.

Berkes, F. 2004. Rethinking Community-Based Conservation. *Conservation Biology*. **18**(3), pp.621–630.

Biggs, D., Ban, N.C., Castilla, J.C., Gelcich, S., Mills, M., Gandiwa, E., Etienne, M., Knight, A.T., Marquet, P.A. and Possingham, H.P. 2019. Insights on fostering the emergence of robust conservation actions from Zimbabwe’s CAMPFIRE program. *Global Ecology and Conservation*. **17**, e00538.

Biggs, D., Cooney, R., Roe, D., Dublin, H.T., Allan, J.R., Challender, D.W.S. and Skinner, D. 2017. Developing a theory of change for a community-based response to illegal wildlife trade. *Conservation Biology*. **31**(1), pp.5–12.

Blaikie, P. 2006. Is Small Really Beautiful? Community-based Natural Resource Management in Malawi and Botswana. *World Development*. **34**(11), pp.1942–1957.

Booker, F. and Roe, D. 2017. *First line of defence? A review of evidence on the effectiveness of engaging communities to tackle illegal wildlife trade* [Online]. London: IIED. Available from: https://pubs.iied.org/17591iied.

Borrini-Feyerabend, G., Dudley, N., Jaeger, T., Lassen, B., Pathak Broome, N., Phillips, A. and Sandwith, T. 2013. *Governance of protected areas: from understanding to action* [Online]. Gland, Switzerland: IUCN. Available from: https://www.iucn.org/resources/publication/governance-protected-areas-understanding-action.

Borrini-Feyerabend, G., Kothari, A. and Oviedo, G. 2004. *Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation* [Online]. Gland, Switzerland and Cambridge, UK: IUCN. Available from: https://portals.iucn.org/library/node/8549.

Brofeldt, S., Argyriou, D., Turreira-García, N., Meilby, H., Danielsen, F. and Theilade, I. 2018. Community-Based Monitoring of Tropical Forest Crimes and Forest Resources Using Information and Communication Technology – Experiences from Prey Lang, Cambodia. *Citizen Science: Theory and Practice*. **3**(2), pp.1–14.

Campbell, B. 2004. Indigenous Views on the Terms of Participation in the Development of Biodiversity Conservation in Nepal *In*: A. Bicker, P. Sillitoe and J. Pottier, eds. *Investigating Local Knowledge: New Directions, New Approaches*. London: Routledge.

Charles, A. and Wilson, L. 2009. Human dimensions of Marine Protected Areas. *ICES Journal of Marine Science*. **66**(1), pp.6–15.

Chiaravalloti, R.M., Skarlatidou, A., Hoyte, S., Badia, M.M., Haklay, M. and Lewis, J. 2022. Extreme citizen science: Lessons learned from initiatives around the globe. *Conservation Science and Practice*. **4**(2), e577.

Chuenpagdee, R., Pascual-Fernández, J.J., Szeliánszky, E., Luis Alegret, J., Fraga, J. and Jentoft, S. 2013. Marine protected areas: Re-thinking their inception. *Marine Policy*. **39**, pp.234–240.

Cinner, J.E., Marnane, M.J. and McClanahan, T.R. 2005. Conservation and Community Benefits from Traditional Coral Reef Management at Ahus Island, Papua New Guinea. *Conservation Biology*. **19**(6), pp.1714–1723.

Cleaver, F. 1999. Paradoxes of participation: questioning participatory approaches to development. *Journal of International Development*. **11**(4), pp.597–612.

Cooney, R., Roe, D., Dublin, H. and Booker, F. 2018. *Wild life, Wild Livelihoods: Involving Communities in Sustainable Wildlife Management and Combatting the Illegal Wildlife Trade* [Online]. Nairobi, Kenya: United Nations Environment Programme. Available from: https://wedocs.unep.org/bitstream/handle/20.500.11822/22864/WLWL\_Report\_web.pdf.

Cornwall, A. 2008. Unpacking ‘Participation’: models, meanings and practices. *Community Development Journal*. **43**(3), pp.269–283.

Coulibaly-Lingani, P., Savadogo, P., Tigabu, M. and Oden, P.-C. 2011. Factors influencing people’s participation in the forest management program in Burkina Faso, West Africa. *Forest Policy and Economics*. **13**(4), pp.292–302.

Cowie, W., Al Dhaheri, S., Al Hashmi, A., Solis-Rivera, V., Baigun, C., Chang, K., Cooney, R., Kamaka‘ala, S., Lindeman, K., Louwa, C., Roe, D., Walker-Painemilla, K., Al Baharna, R., Al Ameri, M., Al Hameli, S., Al Jaberi, K., Alzahlawi, N., Binkulaib, R. and Al Kharusi, Y. 2020. *IUCN guidelines for gathering of fishers’ knowledge for policy development and applied use* [Online]. Gland, Switzerland: IUCN. Available from: https://portals.iucn.org/library/node/49130.

Crawford, B.R., Dutton, I.M., Rotinsulu, C. and Hale, L.Z. 1998. Community-Based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi *In*: Townsville, Australia. Available from: https://pdf.usaid.gov/pdf\_docs/pnacn150.pdf.

Danielsen, F., Burgess, N.D. and Balmford, A. 2005. Monitoring Matters: Examining the Potential of Locally-based Approaches. *Biodiversity & Conservation*. **14**, pp.2507–2542.

Danielsen, F., Burgess, N.D., Balmford, A., Donald, P.F., Funder, M., Jones, J.P.G., Alviola, P., Balete, D.S., Blomley, T., Brashares, J., Child, B., Enghoff, M., Fjeldså, J., Holt, S., Hübertz, H., Jensen, A.E., Jensen, P.M., Massao, J., Mendoza, M.M., Ngaga, Y., Poulsen, M.K., Rueda, R., Sam, M., Skielboe, T., Stuart-Hill, G., Topp-Jørgensen, E. and Yonten, D. 2009. Local Participation in Natural Resource Monitoring: a Characterization of Approaches. *Conservation Biology*. **23**(1), pp.31–42.

Danielsen, F., Enghoff, M., Poulsen, M.K., Funder, M., Jensen, P.M. and Burgess, N.D. 2021. The Concept, Practice, Application, and Results of Locally Based Monitoring of the Environment. *BioScience*. **71**(5), pp.484–502.

Dawson, N., Coolsaet, B., Sterling, E., Loveridge, R., Gross-Camp, N., Wongbusarakum, S., Sangha, K., Scherl, L., Phan, H., Zafra-Calvo, N., Lavey, W., Byakagaba, P., Idrobo, C.J., Chenet, A., Bennett, N., Mansourian, S. and Rosado-May, F. 2021. The role of Indigenous peoples and local communities in effective and equitable conservation. *Ecology and Society*. **26**(3).

Dawson, N., Martin, A. and Danielsen, F. 2018. Assessing Equity in Protected Area Governance: Approaches to Promote Just and Effective Conservation. *Conservation Letters*. **11**(2), e12388.

Dudley, N. (ed.). 2008. *Guidelines for Applying Protected Area Management Categories* [Online]. Gland, Switzerland: IUCN. WITH Stolton, S., Shadie, P. and Dudley, N. (2013). IUCN WCPA Best Practice Guidance on Recognising Protected Areas and Assigning Management Categories and Governance Types, Best Practice Protected Area Guidelines Series No. 21, Gland, Switzerland: IUCN. Available from: https://portals.iucn.org/library/node/9243.

Dunnighan, C. and Norris, C. 1999. The Detective, the Snout, and the Audit Commission: The Real Costs in Using Informants. *The Howard Journal of Criminal Justice*. **38**(1), pp.67–86.

Eisenbarth, S., Graham, L. and Rigterink, A.S. 2021. Can community monitoring save the commons? Evidence on forest use and displacement. *Proceedings of the National Academy of Sciences*. **118**(29), e2015172118.

Elliott, G., Mitchell, B., Wiltshire, B., Manan, Ir.A. and Wismer, S. 2001. Community Participation in Marine Protected Area Management: Wakatobi National Park, Sulawesi, Indonesia. *Coastal Management*. **29**(4), pp.295–316.

Epstein, G., Gurney, G., Chawla, S., Anderies, J.M., Baggio, J., Unnikrishnan, H., Villamayor Tomas, S. and Cumming, G.S. 2021. Drivers of compliance monitoring in forest commons. *Nature Sustainability*. **4**(5), pp.450–456.

Fernandes, D. 2006. ‘More Eyes Watching’ Community-based Management of the Arapaima (Arapaima gigas) in Central Guyana *In*: Bloomington, IN: Digital Library of the Commons. Available from: https://dlc.dlib.indiana.edu/dlc/handle/10535/711.

Fidler, R.Y., Ahmadia, G.N., Amkieltiela, Awaludinnoer, Cox, C., Estradivari, Glew, L., Handayani, C., Mahajan, S.L., Mascia, M.B., Pakiding, F., Andradi-Brown, D.A., Campbell, S.J., Claborn, K., De Nardo, M., Fox, H.E., Gill, D., Hidayat, N.I., Jakub, R., Le, D.T., Purwanto, Valdivia, A. and Harborne, A.R. 2022. Participation, not penalties: Community involvement and equitable governance contribute to more effective multiuse protected areas. *Science Advances*. **8**(18), eabl8929.

Freitas, R.R. de, Costa, R.C., Alvite, C.M.D.C., Balensiefer, D.C., Barros, C.R. de M.B. de and Prado, J.H. 2022. Challenges for fishers’ engagement in Marine Protected Areas: Lessons from Right Whale Environmental Protection Area, Southern Brazil. *Marine Policy*. **143**, 105135.

Fritz-Vietta, N.V.M., Röttger, C. and Stoll-Kleemann, S. 2009. Community-based management in two biosphere reserves in Madagascar – distinctions and similarities: What can be learned from different approaches ? *Madagascar Conservation & Development*. **4**(2), pp.86–97.

Funder, M., Danielsen, F., Ngaga, Y., Nielsen, M.R. and Poulsen, M.K. 2013. Reshaping Conservation: The Social Dynamics of Participatory Monitoring in Tanzania’s Community-managed Forests. *Conservation and Society*. **11**(3), pp.218–232.

Gardner, C.J., Cripps, G., Day, L.P., Dewar, K., Gough, C., Peabody, S., Tahindraza, G. and Harris, A. 2020. A decade and a half of learning from Madagascar’s first locally managed marine area. *Conservation Science and Practice*. **2**(12), e298.

Gatiso, T.T., Kulik, L., Bachmann, M., Bonn, A., Bösch, L., Freytag, A., Heurich, M., Wesche, K., Winter, M., Ordaz-Németh, I., Sop, T. and Kühl, H.S. 2022. Sustainable protected areas: Synergies between biodiversity conservation and socioeconomic development. *People and Nature*. **4**(4), pp.893–903.

Gonedelé Bi, S., Bitty, E.A., Yao, A.K. and McGraw, W.S. 2019. Foot Patrols Enhance Conservation Efforts in Threatened Forest Reserves of Coastal Côte d’Ivoire. *Tropical Conservation Science*. **12**, pp.1–10.

Guamba, J.M.E. 2021. Management of conservation areas with participation of communities in Mozambique. *International Journal of Research -GRANTHAALAYAH*. **9**(1), pp.189–201.

Guibrunet, L., Gerritsen, P.R.W., Sierra-Huelsz, J.A., Flores-Díaz, A.C., García-Frapolli, E., García-Serrano, E., Pascual, U. and Balvanera, P. 2021. Beyond participation: How to achieve the recognition of local communities’ value-systems in conservation? Some insights from Mexico. *People and Nature*. **3**(3), pp.528–541.

Gurney, G.G., Cinner, J.E., Sartin, J., Pressey, R.L., Ban, N.C., Marshall, N.A. and Prabuning, D. 2016. Participation in devolved commons management: Multiscale socioeconomic factors related to individuals’ participation in community-based management of marine protected areas in Indonesia. *Environmental Science & Policy*. **61**, pp.212–220.

Harrington, C., Curtis, A. and Black, R. 2008. Locating Communities in Natural Resource Management. *Journal of Environmental Policy & Planning*. **10**(2), pp.199–215.

Heck, N. and Dearden, P. 2012. Local Expectations for Future Marine Protected Area Performance: A Case Study of the Proposed National Marine Conservation Area in the Southern Strait of Georgia, Canada. *Coastal Management*. **40**(6), pp.577–593.

Holmes, G. 2013. Exploring the Relationship Between Local Support and the Success of Protected Areas. *Conservation and Society*. **11**(1), pp.72–82.

Hoyte, S. 2021. Co-Designing Extreme Citizen Science Projects in Cameroon: Biodiversity Conservation Led by Local Values and Indigenous Knowledge *In*: A. Skarlatidou and M. Haklay, eds. *Geographic Citizen Science Design: No One Left Behind* [Online]. London: UCL Press, pp.247–65. Available from: https://doi.org/10.2307/j.ctv15d8174.20.

Htay, T., Htoo, K.K., Mbise, F.P. and Røskaft, E. 2022. Factors Influencing Communities’ Attitudes and Participation in Protected Area Conservation: A Case Study from Northern Myanmar. *Society & Natural Resources*. **35**(3), pp.301–319.

Hübschle, A. and Shearing, C. 2018. *Ending Wildlife Trafficking: Local communities as change agents* [Online]. Geneva, Switzerland: The Global Initiative Against Transnational Organized Crime. Available from: https://globalinitiative.net/analysis/ending-wildlife-trafficking/.

Ido, A. 2019. The effect of social capital on collective action in community forest management in Cambodia. *International Journal of the Commons*. **13**(1), pp.777–803.

Idrissou, L., van Paassen, A., Aarts, N., Vodouhè, S. and Leeuwis, C. 2013. Trust and hidden conflict in participatory natural resources management: The case of the Pendjari national park (PNP) in Benin. *Forest Policy and Economics*. **27**, pp.65–74.

IIED and IUCN-SULi (eds.) 2019. *Community-led approaches to tackling illegal wildlife trade. Case studies from Latin America* [Online]. London: IIED. Available from: https://pubs.iied.org/17656iied.

Inoue, M., Terauchi, D., Fujii, K., Tsunoda, K., Okubo, N., Takamura, Y., Hidayat, H., Imang, N., Nanang, M., Voo, P. and Nath, T.K. 2021. Understanding Local Peoples’ Participation as “Means” and “Ends” in Protected Areas Management: A Qualitative Study in the Heart of Borneo. *Journal of Sustainable Forestry*., pp.1–12.

IUCN SULi, IIED, CEED, Austrian Ministry of Environment, and TRAFFIC. 2015. Beyond enforcement: communities, governance, incentives and sustainable use in combating wildlife crime. Symposium Report. *In*: Glenburn Lodge, Muldersdrift, South Africa. Available from: https://pubs.iied.org/g03903.

Jentoft, S., McCay, B.J. and Wilson, D.C. 1998. Social theory and fisheries co-management. *Marine Policy*. **22**(4), pp.423–436.

Johnson, A.F., Kleiber, D., Gomese, C., Sukulu, M., Saeni-Oeta, J., Giron-Nava, A., Cohen, P.J. and McDougall, C. 2021. *Assessing inclusion in community-based resource management: A framework and methodology* [Online]. Penang, Malaysia. Available from: https://digitalarchive.worldfishcenter.org/handle/20.500.12348/4997.

Kahler, J.S. and Rinkus, M.A. 2021. Women and wildlife crime: hidden offenders, protectors and victims. *Oryx*. **55**(6), pp.835–843.

Kaluma, K. and Umar, B.B. 2021. Outcomes of participatory fisheries management: An example from co-management in Zambia’s Mweru-Luapula fishery. *Heliyon*. **7**(2), e06083.

Kashwan, P., V. Duffy, R., Massé, F., Asiyanbi, Adeniyi P. and Marijnen, E. 2021. From Racialized Neocolonial Global Conservation to an Inclusive and Regenerative Conservation. *Environment: Science and Policy for Sustainable Development*. **63**(4), pp.4–19.

Kimengsi, J.N., Bhusal, P., Aryal, A., Fernandez, M.V.B.C., Owusu, R., Chaudhary, A. and Nielsen, W. 2019. What (De)Motivates Forest Users’ Participation in Co-Management? Evidence from Nepal. *Forests*. **10**(6), 512.

Kujirakwinja, D., Plumptre, A.J., Twendilonge, A., Mitamba, G., Mubalama, L., Wasso, J.D.D., Kisumbu, O., Shamavu, B., Ayebare, S., Bitomwa, O. and Tshombe, R. 2019. Establishing the Itombwe Natural Reserve: science, participatory consultations and zoning. *Oryx*. **53**(1), pp.49–57.

Lamichhane, S., Joshi, R., Poudel, B. and Subedi, P. 2020. Role of Community in Leading Conservation: Effectiveness, Success and Challenges of Community-Based Anti-Poaching Unit in Nepal. *Grassroots Journal of Natural Resources*. **3**(4), pp.94–109.

Lammers, P.L., Richter, T., Lux, M., Ratsimbazafy, J. and Mantilla-Contreras, J. 2017. The challenges of community-based conservation in developing countries—A case study from Lake Alaotra, Madagascar. *Journal for Nature Conservation*. **40**, pp.100–112.

Leavitt, K., Wodahl, E.J. and Schweitzer, K. 2021. Citizen Willingness to Report Wildlife Crime. *Deviant Behavior*. **42**(10), pp.1256–1272.

Linkie, M., Martyr, D.J., Harihar, A., Risdianto, D., Nugraha, R.T., Maryati, Leader-Williams, N. and Wong, W.-M. 2015. EDITOR’S CHOICE: Safeguarding Sumatran tigers: evaluating effectiveness of law enforcement patrols and local informant networks. *Journal of Applied Ecology*. **52**(4), pp.851–860.

Linkie, M., Sloan, S., Kasia, R., Kiswayadi, D. and Azmi, W. 2014. Breaking the Vicious Circle of Illegal Logging in Indonesia. *Conservation Biology*. **28**(4), pp.1023–1033.

Lotter, W. and Clark, K. 2014. Community involvement and joint operations aid effective anti-poaching in Tanzania. *PARKS*. **20**(1), pp.19–27.

Luswaga, H. and Nuppenau, E.-A. 2020. Participatory Forest Management in West Usambara Tanzania: What Is the Community Perception on Success? *Sustainability*. **12**(3), 921.

Major, K., Smith, D. and Migliano, A.B. 2018. Co-Managers or Co-Residents? Indigenous Peoples’ Participation in the Management of Protected Areas: a Case Study of the Agta in the Philippines. *Human Ecology*. **46**(4), pp.485–495.

Mannigel, E. 2008. Integrating Parks and People: How Does Participation Work in Protected Area Management? *Society & Natural Resources*. **21**(6), pp.498–511.

Martin, E. and Martin, C. 2010. Enhanced community support reduces rhino poaching in Nepal. *Pachyderm*. **48**, pp.48–56.

Martin, E. and Vigne, L. 2012. Successful rhino conservation continues in West Bengal, India. *Pachyderm*. **51**, pp.27–37.

Massé, F., Gardiner, A., Lubilo, R. and Themba, M. 2017. Inclusive Anti-poaching? Exploring the Potential and Challenges of Community-based Anti-Poaching. *South African Crime Quarterly*. (60), pp.19–27.

de Mattos Vieira, M.A.R., von Muhlen, E.M. and Shepard, G.H. 2015. Participatory Monitoring and Management of Subsistence Hunting in the Piagaçu-Purus Reserve, Brazil. *Conservation and Society*. **13**(3), pp.254–264.

Mawutor, S.M. and Hajjar, R. 2022. Examining the powers decentralized to community resource management areas in Ghana. *Land Use Policy*. **119**, 106204.

Mbeche, R., Ateka, J., Herrmann, R. and Grote, U. 2021. Understanding forest users’ participation in participatory forest management (PFM): Insights from Mt. Elgon forest ecosystem, Kenya. *Forest Policy and Economics*. **129**, 102507.

Miller, A.E., Davenport, A., Chen, S., Hart, C., Gary, D., Fitzpatrick, B., Muflihati, Kartikawati, Sudaryanti and Sagita, N. 2020. Using a participatory impact assessment framework to evaluate a community-led mangrove and fisheries conservation approach in West Kalimantan, Indonesia. *People and Nature*. **2**(4), pp.1061–1074.

Millner, N., Peñagaricano, I., Fernandez, M. and Snook, L.K. 2020. The politics of participation: Negotiating relationships through community forestry in the Maya Biosphere Reserve, Guatemala. *World Development*. **127**, 104743.

Minter, T., van der Ploeg, J., Pedrablanca, M., Sunderland, T. and Persoon, G.A. 2014. Limits to Indigenous Participation: The Agta and the Northern Sierra Madre Natural Park, the Philippines. *Human Ecology: An Interdisciplinary Journal*. **42**(5), pp.769–778.

Mogomotsi, P.K., Mogomotsi, G.E.J., Dipogiso, K., Phonchi-Tshekiso, N.D., Stone, L.S. and Badimo, D. 2020. An Analysis of Communities’ Attitudes Toward Wildlife and Implications for Wildlife Sustainability. *Tropical Conservation Science*. **13**, pp.1–9.

Montana, J. 2017. Accommodating consensus and diversity in environmental knowledge production: Achieving closure through typologies in IPBES. *Environmental Science & Policy*. **68**, pp.20–27.

Montana, J. 2019. Co-production in action: perceiving power in the organisational dimensions of a global biodiversity expert process. *Sustainability Science*. **14**(6), pp.1581–1591.

Mortson, D. and Kafu, G.Y. 2022. Landowners’ Perceptions and Involvement in the Management of Kyabobo National Park, Ghana. *African Journal of Hospitality and Tourism Management*. **3**(2), pp.40–58.

Moustard, F., Haklay, M., Lewis, J., Albert, A., Moreu, M., Chiaravalloti, R., Hoyte, S., Skarlatidou, A., Vittoria, A., Comandulli, C., Nyadzi, E., Vitos, M., Altenbuchner, J., Laws, M., Fryer-Moreira, R. and Artus, D. 2021. Using Sapelli in the Field: Methods and Data for an Inclusive Citizen Science. *Frontiers in Ecology and Evolution*. **9**, 638870.

Nchanji, Y.K., Ramcilovic-Suominen, S. and Kotilainen, J. 2021. Power imbalances, social inequalities and gender roles as barriers to true participation in national park management: The case of Korup National Park, Cameroon. *Forest Policy and Economics*. **130**, 102527.

Ngorima, A., Brown, A., Masunungure, C. and Biggs, D. 2020. Local community benefits from elephants: Can willingness to support anti-poaching efforts be strengthened? *Conservation Science and Practice*. **2**(12), e303.

Nicholas, A., Warren, Y., Bila, S., Ekinde, A., Ikfuingei, R. and Tampie, R. 2010. Successes in Community-Based Monitoring of Cross River Gorillas (Gorilla gorilla diehli) in Cameroon. *African Primates*. **7**(1), pp.55–60.

Niskanen, L., Roe, D., Rowe, W., Dublin, H. and Skinner, D. 2018. *Strengthening Local Community Engagement in Combatting Illegal Wildlife Trade - Case studies from Kenya*. Nairobi, Kenya: IUCN.

Ojha, H.R., Ford, R., Keenan, R.J., Race, D., Carias Vega, D., Baral, H. and Sapkota, P. 2016. Delocalizing Communities: Changing Forms of Community Engagement in Natural Resources Governance. *World Development*. **87**, pp.274–290.

Oldekop, J.A., Holmes, G., Harris, W.E. and Evans, K.L. 2016. A global assessment of the social and conservation outcomes of protected areas. *Conservation Biology*. **30**(1), pp.133–141.

Pereira, J., Santos, M.J. and Rosalino, L.M. 2022. Role of local communities in the social network of the protected area management. *Conservation Science and Practice*. **4**(5), e12664.

Persha, L., Agrawal, A. and Chhatre, A. 2011. Social and Ecological Synergy: Local Rulemaking, Forest Livelihoods, and Biodiversity Conservation. *Science*. **331**(6024), pp.1606–1608.

Pollnac, R.B., Crawford, B.R. and Gorospe, M.L.G. 2001. Discovering factors that influence the success of community-based marine protected areas in the Visayas, Philippines. *Ocean & Coastal Management*. **44**(11), pp.683–710.

Pomeroy, R.S. and Williams, M.J. 1994. *Fisheries co-management and small-scale fisheries: a policy brief* [Online]. Manila, Philippines: International Center for Living Aquatic Resources Management. Available from: https://digitalarchive.worldfishcenter.org/handle/20.500.12348/2857.

Premauer, J.M. and Berkes, F. 2015. A Pluralistic Approach to Protected Area Governance: Indigenous Peoples and Makuira National Park, Colombia. *Ethnobiology and Conservation*. **4**, pp.1–16.

Pretty, J.N. 1995. Participatory learning for sustainable agriculture. *World Development*. **23**(8), pp.1247–1263.

Purdeková, A. 2011. ‘Even if I am not here, there are so many eyes’: surveillance and state reach in Rwanda. *The Journal of Modern African Studies*. **49**(3), pp.475–497.

Rampheri, M.B. and Dube, T. 2021. Local community involvement in nature conservation under the auspices of Community-Based Natural Resource Management: A state of the art review. *African Journal of Ecology*. **59**(4), pp.799–808.

Reed, M.S., Vella, S., Challies, E., de Vente, J., Frewer, L., Hohenwallner-Ries, D., Huber, T., Neumann, R.K., Oughton, E.A., Sidoli del Ceno, J. and van Delden, H. 2018. A theory of participation: what makes stakeholder and public engagement in environmental management work? *Restoration Ecology*. **26**(S1), pp.S7–S17.

Ribot, J.C., Lund, J.F. and Treue, T. 2010. Democratic decentralization in sub-Saharan Africa: its contribution to forest management, livelihoods, and enfranchisement. *Environmental Conservation*. **37**(1), pp.35–44.

Robinson, E.J.Z. and Lokina, R.B. 2012. Efficiency, enforcement and revenue tradeoffs in participatory forest management: an example from Tanzania. *Environment and Development Economics*. **17**(1), pp.1–20.

Roe, D., Dublin, H., Niskanen, L., Skinner, D. and Vishwanath, A. 2018. *Local communities: the overlooked first line of defence for wildlife* [Online]. London: IIED. Available from: https://pubs.iied.org/17455iied.

Roig-Boixeda, P., Phallin, C., Brozovic, Y., You, R., Neung, S., San, T., Teoh, M. and West, K. 2018. Using patrol records and local perceptions to inform management and enforcement in a marine protected area in Cambodia. *Cambodian Journal of Natural History*. **2018**(1), pp.9–23.

Ruano-Chamorro, C., Gurney, G.G. and Cinner, J.E. 2022. Advancing procedural justice in conservation. *Conservation Letters*. **15**(3), e12861.

Ruiz-Mallén, I., Schunko, C., Corbera, E., Rös, M. and Reyes-García, V. 2015. Meanings, drivers, and motivations for community-based conservation in Latin America. *Ecology and Society*. **20**(3).

Runacres, A. 2021. Doing Chowkidaari: Vulnerability in Village-Forest Relations and the Compulsion of Forest Work. *Conservation and Society*. **19**(4), pp.271–281.

Ryan, R.M. and Deci, E.L. 2000. Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*. **25**(1), pp.54–67.

Simpson, B., Piseth, S., Leng, H., Sopheak, C. and Daltry, J.C. 2006. *Community Crocodile Wardens in Cambodia: Performance, Problems and Potential*. Fauna & Flora International - Cambodia Programme and Forestry Administration.

Simpson, F.O. and Pellegrini, L. 2022. Conservation, extraction and social contracts at a violent frontier: Evidence from eastern DRC’s Itombwe Nature Reserve. *Political Geography*. **92**, 102519.

Skinner, D., Dublin, H., Niskanen, L., Roe, D. and Vishwanath, A. 2018. *Local communities: First Line of Defence against Illegal Wildlife Trade (FLoD). Guidance for implementing the FLoD methodology* [Online]. London and Gland: IIED and IUCN. Available from: https://pubs.iied.org/14672iied.

Slough, T., Kopas, J. and Urpelainen, J. 2021. Satellite-based deforestation alerts with training and incentives for patrolling facilitate community monitoring in the Peruvian Amazon. *Proceedings of the National Academy of Sciences*. **118**(29), e2015171118.

Sok, S. and Yu, X. 2021. Co-management of small-scale fishery in the Tonle Sap Lake, Cambodia. *Regional Sustainability*. **2**(1), pp.1–11.

Soliku, O. and Schraml, U. 2020. Protected areas management: A comparison of perceived outcomes associated with different co-management types. *Forest Policy and Economics*. **118**, 102258.

Staddon, S.C., Nightingale, A. and Shrestha, S.K. 2015. Exploring participation in ecological monitoring in Nepal’s community forests. *Environmental Conservation*. **42**(3), pp.268–277.

Staddon, S.C., Nightingale, A. and Shrestha, S.K. 2014. The Social Nature of Participatory Ecological Monitoring. *Society & Natural Resources*. **27**(9), pp.899–914.

Stewart, B.D., Howarth, L.M., Wood, H., Whiteside, K., Carney, W., Crimmins, É., O’Leary, B.C., Hawkins, J.P. and Roberts, C.M. 2020. Marine Conservation Begins at Home: How a Local Community and Protection of a Small Bay Sent Waves of Change Around the UK and Beyond. *Frontiers in Marine Science*. **7**, 76.

Tarimo, K.V. and Olotu, M.I. 2020. Local community participation in wildlife conservation and management in Rungwa Game Reserve, Tanzania. *Environmental & Socio-economic Studies*. **8**(2), pp.21–31.

Travers, H. 2021a. *Implementing park action plans for community engagement to tackle IWT: Project research report* [Online]. London: IIED. Available from: https://pubs.iied.org/20526g.

Travers, H. 2021b. *Improving community attitudes towards conservation: learning from efforts to address wildlife crime in Uganda* [Online]. London: IIED. Available from: https://pubs.iied.org/20461iied.

Travers, H. 2017. *Murchison Falls National Park: Community-Based Wildlife Crime Prevention Action Plan* [Online]. London: IIED. Available from: https://pubs.iied.org/g04161.

United Nations Development Programme 2013. *Chunoti Co-Management Committee, Bangladesh* [Online]. New York, NY. Available from: https://www.equatorinitiative.org/2017/05/28/chunoti-co-management-committee/.

United Nations Development Programme 2015. *Matumizi Bora ya Malihai Idodi na Pawaga (MBOMIPA) Wildlife Management Area, Tanzania* [Online]. New York, NY. Available from: https://www.equatorinitiative.org/2017/05/29/matumizi-bora-ya-malihai-idodi-na-pawaga-mbomipa-wildlife-management-area/.

United Nations Development Programme 2012. *Monks Community Forest, Cambodia* [Online]. New York, NY. Available from: https://www.equatorinitiative.org/2017/05/29/monks-community-forest/.

Vitos, M., Lewis, J., Stevens, M. and Haklay, M. 2013. Making local knowledge matter: supporting non-literate people to monitor poaching in Congo *In*: *Third Annual Symposium on Computing for Development (ACM DEV 2013)* [Online]. Bangalore, India: ACM Press. Available from: http://dl.acm.org/citation.cfm?doid=2442882.2442884.

Walker, D., Jones, J.P., Roberts, S.M. and Fröhling, O.R. 2007. When Participation Meets Empowerment: The WWF and the Politics of Invitation in the Chimalapas, Mexico. *Annals of the Association of American Geographers*. **97**(2), pp.423–444.

Ward, C., Holmes, G. and Stringer, L. 2018. Perceived barriers to and drivers of community participation in protected-area governance. *Conservation Biology*. **32**(2), pp.437–446.

Ward, C., Stringer, L. and Holmes, G. 2018. Changing governance, changing inequalities: Protected area co-management and access to forest ecosystem services: a Madagascar case study. *Ecosystem Services*. **30**, pp.137–148.

Ward, C., Stringer, L.C. and Holmes, G. 2018. Protected area co-management and perceived livelihood impacts. *Journal of Environmental Management*. **228**, pp.1–12.

Weeks, R. and Jupiter, S.D. 2013. Adaptive Comanagement of a Marine Protected Area Network in Fiji. *Conservation Biology*. **27**(6), pp.1234–1244.

Wells, M., Brandon, K. and Hannah, L. 1992. *People and Parks: Linking Protected Area Management With Local Communities*. Washington, D.C: World Bank.

Wilfred, P., Milner-Gulland, E.J. and Travers, H. 2019. Attitudes to illegal behaviour and conservation in western Tanzania. *Oryx*. **53**(3), pp.513–522.

Wilson, N.J., Mutter, E., Inkster, J. and Satterfield, T. 2018. Community-Based Monitoring as the practice of Indigenous governance: A case study of Indigenous-led water quality monitoring in the Yukon River Basin. *Journal of Environmental Management*. **210**, pp.290–298.

Yahaya, A.-K., Zakaria, A. and Boasu, B.Y. 2021. Local actors in the co-management of mole national park and the impacts associated with it. *Ghana Journal of Geography*. **13**(3), pp.200–230.

Yamagiwa, J. 2003. Bushmeat Poaching and the Conservation Crisis in Kahuzi-Biega National Park, Democratic Republic of the Congo. *Journal of Sustainable Forestry*. **16**(3–4), pp.111–130.

Youdelis, M. 2016. “They could take you out for coffee and call it consultation!”: The colonial antipolitics of Indigenous consultation in Jasper National Park. *Environment and Planning A: Economy and Space*. **48**(7), pp.1374–1392.

***Bibliography of the law enforcement literature***

Agrawal, A. and Gibson, C.C. 1999. Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development*. **27**(4), pp.629–649.

Akella, A.S. and Cannon, J.B. 2004. *Strengthening the Weakest Links: Strategies for Improving the Enforcement of Environmental Laws Globally* [Online]. Center for Conservation and Government: Conservation International. Available from: https://biodiversitylinks.org/learning-evidence/combating-wildlife-trafficking/evidence/evidence-inbox/strengthening-the-weakest-links-strategies-for-improving-the-enforcement-of-environmental-laws-globally/view.

Albers, H.J. and Grinspoon, E. 1997. A comparison of the enforcement of access restrictions between Xishuangbanna Nature Reserve (China) and Khao Yai National Park (Thailand). *Environmental Conservation*. **24**(4), pp.351–362.

Anagnostou, M., Gunn, V., Nibbs, O., Muntaner, C. and Doberstein, B. 2022. An international scoping review of rangers’ precarious employment conditions. *Environment Systems and Decisions*.

Andriamalala, G., Peabody, S., Gardner, Charlie.J. and Westerman, K. 2013. Using social marketing to foster sustainable behaviour in traditional fishing communities of southwest Madagascar. *Conservation Evidence*. (10), pp.37–41.

Arias, A. 2015. Understanding and managing compliance in the nature conservation context. *Journal of Environmental Management*. **153**, pp.134–143.

Arias, A., Bergseth, B.J., Weekers, D. and Wilcox, C. 2021. Countering Avoidance Strategies Used by Fishers to Avoid Detection During Illegal Fishing. *Frontiers in Marine Science*. **8**, 619349.

Arias, A., Cinner, J.E., Jones, R.E. and Pressey, R.L. 2015. Levels and drivers of fishers’ compliance with marine protected areas. *Ecology and Society*. **20**(4), 19.

Ayling, J. 2013. Harnessing Third Parties for Transnational Environmental Crime Prevention. *Transnational Environmental Law*. **2**(2), pp.339–362.

Becker, G.S. 1968. Crime and Punishment: An Economic Approach. *Journal of Political Economy*. **76**(2), pp.169–217.

Belecky, M. and Gray, T.N.E. 2020. *Silence of the Snares: Southeast Asia’s Snaring Crisis* [Online]. WWF International. Available from: https://www.worldwildlife.org/publications/silence-of-the-snares-southeast-asia-s-snaring-crisis.

Belecky, M., Singh, R. and Moreto, W. 2019. *Life on the Frontline 2019: A Global Survey of the Working Conditions of Rangers* [Online]. WWF. Available from: https://www.worldwildlife.org/publications/life-on-the-frontline-2019-a-global-survey-of-the-working-conditions-of-rangers.

Belhekar, V., Paranjpye, P., Bhatkhande, A. and Chavan, R. 2020. Guarding the guardians: understanding the psychological well-being of forest guards in Indian tiger reserves. *Biodiversity*. **21**(2), pp.83–89.

Bennett, N.J. and Dearden, P. 2014. From measuring outcomes to providing inputs: Governance, management, and local development for more effective marine protected areas. *Marine Policy*. **50**, pp.96–110.

Bergseth, B.J., Gurney, G.G., Barnes, M.L., Arias, A. and Cinner, J.E. 2018. Addressing poaching in marine protected areas through voluntary surveillance and enforcement. *Nature Sustainability*. **1**(8), pp.421–426.

Browne, C., Ronis, E.M., Miller, J.R.B., Kapetanakos, Y., Gibbs, S., Hendrix, T. and Carlson Bremer, D. 2021. Systems Approaches to Combating Wildlife Trafficking: Expanding Existing Frameworks to Facilitate Cross-Disciplinary Collaboration. *Frontiers in Conservation Science*. **2**, 698666.

Brunner, J., Seymour, F., Badenoch, N. and Ratner, B. 1999. *Forest problems and law enforcement in Southeast Asia* [Online]. World Resources Institute. Available from: https://www.wri.org/research/forest-problems-and-law-enforcement-southeast-asia.

Challender, D.W.S. and MacMillan, D.C. 2014. Poaching is more than an Enforcement Problem. *Conservation Letters*. **7**(5), pp.484–494.

Charles, M.T. 1982. The Yellowstone Ranger: The Social Control and Socialization of Federal Law Enforcement Officers. *Human Organization*. **41**(3), pp.216–226.

Chhatre, A. and Agrawal, A. 2008. Forest commons and local enforcement. *Proceedings of the National Academy of Sciences*. **105**(36), pp.13286–13291.

Claridge, G., Chea-Leth, V. and Van Chhoan, I. 2005. *The effectiveness of law enforcement against forest and wildlife crime: a study of enforcement disincentives and other relevant factors in Southwestern Cambodia*. Washington, DC, USA: East-West Management Institute, Conservation International, and U.S. Agency for International Development.

Clarke, H.R., Reed, W.J. and Shrestha, R.M. 1993. Optimal enforcement of property rights on developing country forests subject to illegal logging. *Resource and Energy Economics*. **15**(3), pp.271–293.

Collins, C., Nuno, A., Broderick, A., Curnick, D.J., de Vos, A., Franklin, T., Jacoby, D.M.P., Mees, C., Moir-Clark, J., Pearce, J. and Letessier, T.B. 2021. Understanding Persistent Non-compliance in a Remote, Large-Scale Marine Protected Area. *Frontiers in Marine Science*. **8**, pp.1–13.

Cowan, D., Burton, C. and Moreto, W. 2019. Conservation-based intelligence-led policing: An intra-organizational interpersonal examination. *Policing: An International Journal*. **42**(1), pp.108–122.

Crawford, B.R., Siahainenia, A., Rotinsulu, C. and Sukmara, A. 2004. Compliance and Enforcement of Community-Based Coastal Resource Management Regulations in North Sulawesi, Indonesia. *Coastal Management*. **32**(1), pp.39–50.

Critchlow, R., Plumptre, A.J., Alidria, B., Nsubuga, M., Driciru, M., Rwetsiba, A., Wanyama, F. and Beale, C.M. 2017. Improving Law-Enforcement Effectiveness and Efficiency in Protected Areas Using Ranger-collected Monitoring Data. *Conservation Letters*. **10**(5), pp.572–580.

Davis, K.L.F., Russ, G.R., Williamson, D.H. and Evans, R.D. 2004. Surveillance and Poaching on Inshore Reefs of the Great Barrier Reef Marine Park. *Coastal Management*. **32**(4), pp.373–387.

Denninger Snyder, K., Mneney, P.B. and Wittemyer, G. 2019. Predicting the risk of illegal activity and evaluating law enforcement interventions in the western Serengeti. *Conservation Science and Practice*. **1**(9), e81.

Di Franco, A., Thiriet, P., Di Carlo, G., Dimitriadis, C., Francour, P., Gutiérrez, N.L., Jeudy de Grissac, A., Koutsoubas, D., Milazzo, M., Otero, M. del M., Piante, C., Plass-Johnson, J., Sainz-Trapaga, S., Santarossa, L., Tudela, S. and Guidetti, P. 2016. Five key attributes can increase marine protected areas performance for small-scale fisheries management. *Scientific Reports*. **6**(1), 38135.

Didarali, Z., Kuiper, T., Brink, C.W., Buij, R., Virani, M.Z., Reson, E.O. and Santangeli, A. 2022. Awareness of environmental legislation as a deterrent for wildlife crime: A case with Masaai pastoralists, poison use and the Kenya Wildlife Act. *Ambio*. **51**(7), pp.1632–1642.

Dobson, A.D.M., de Lange, E., Keane, A., Ibbett, H. and Milner-Gulland, E.J. 2019. Integrating models of human behaviour between the individual and population levels to inform conservation interventions. *Philosophical Transactions of the Royal Society B: Biological Sciences*. **374**(1781), 20180053.

Dudley, N., Stolton, S. and Elliott, W. 2013. Editorial: Wildlife crime poses unique challenges to protected areas. *PARKS*. **19**(1), pp.7–12.

Duffy, R., Massé, F., Smidt, E., Marijnen, E., Büscher, B., Verweijen, J., Ramutsindela, M., Simlai, T., Joanny, L. and Lunstrum, E. 2019. Why we must question the militarisation of conservation. *Biological Conservation*. **232**, pp.66–73.

Dutta, A. 2020. *The conservation-corruption conundrum: Understanding everyday relationships between rangers and communities* [Online]. Bergen, Norway: Chr. Michelsen Institute. Available from: https://www.cmi.no/publications/7401-the-conservation-corruption-conundrum-understanding-everyday-relationships-between-rangers-and.

Eliason, S.L. 2011. Policing natural resources: Issues in a conservation law enforcement agency. *Professional Issues in Criminal Justice*. **6**(3 & 4), pp.43–58.

Epstein, G. 2017. Local rulemaking, enforcement and compliance in state-owned forest commons. *Ecological Economics*. **131**, pp.312–321.

Felson, M. 2014. Linking Criminal Choices, Routine Activities, Informal Control, and Criminal Outcomes *In*: D. B. Cornish and R. V. Clarke, eds. *The Reasoning Criminal*. New York: Routledge.

Felson, M. 1995. Those who discourage crime *In*: J. E. Eck and D. Weisburd, eds. *Crime and Place*. Monsey, NY: Criminal Justice Press, pp.53–66.

Filteau, M.R. 2012. Deterring Defiance: ‘Don’t Give a Poacher a Reason to Poach’. *International Journal of Rural Criminology*. **1**(2), pp.236–255.

Funder, M. and Marani, M. 2015. Local bureaucrats as bricoleurs. The everyday implementation practices of county environment officers in rural Kenya. *International Journal of the Commons*. **9**(1), pp.87–106.

Gao, Y. and Li, B.V. 2021. Evaluation of the status, job satisfaction and occupational stress of Chinese nature reserve staff. *Global Ecology and Conservation*. **29**, e01731.

Gavin, M.C., Solomon, J.N. and Blank, S.G. 2010. Measuring and Monitoring Illegal Use of Natural Resources. *Conservation Biology*. **24**(1), pp.89–100.

Gibson, C.C., Williams, J.T. and Ostrom, E. 2005. Local Enforcement and Better Forests. *World Development*. **33**(2), pp.273–284.

Gore, M.L. and Bennett, A. 2022. Importance of deepening integration of crime and conservation sciences. *Conservation Biology*. **36**(1), e13710.

Gray, T.N.E., Hughes, A.C., Laurance, W.F., Long, B., Lynam, A.J., O’Kelly, H., Ripple, W.J., Seng, T., Scotson, L. and Wilkinson, N.M. 2018. The wildlife snaring crisis: an insidious and pervasive threat to biodiversity in Southeast Asia. *Biodiversity and Conservation*. **27**(4), pp.1031–1037.

Haambiya, L., Kaunda, E., Likongwe, J. and Chama, L. 2015. Co-management driven enforcement of rules and regulations on Lake Tanganyika, Zambia. *International Journal of Fisheries and Aquatic Studies*. **2**(6), pp.73–80.

Henson, D.W., Malpas, R.C. and D’udine, F.A.C. 2016. *Wildlife Law Enforcement in Sub-Saharan African Protected Areas - A Review of Best Practices* [Online]. Cambridge, UK and Gland, Switzerland: IUCN. Available from: https://www.iucn.org/resources/research-publication/wildlife-law-enforcement-sub-saharan-african-protected-areas.

Hilborn, R., Arcese, P., Borner, M., Hando, J., Hopcraft, G., Loibooki, M., Mduma, S. and Sinclair, A.R.E. 2006. Effective Enforcement in a Conservation Area. *Science*. **314**(5803), pp.1266–1266.

Holmes, G. and Brockington, D. 2012. Protected Areas – What People Say about Well-Being *In*: D. Roe, J. Elliot, C. Sandbrook and M. Walpole, eds. *Biodiversity Conservation and Poverty Alleviation: Exploring the Evidence for a Link. Conservation Science and Practice Series* [Online]. Wiley-Blackwell, pp.160–172. Available from: http://dx.doi.org/10.1002/9781118428351.ch10.

Hønneland, G. 2000. Compliance in the Barents Sea fisheries. How fishermen account for conformity with rules. *Marine Policy*. **24**(1), pp.11–19.

Huang, L. and Chen, S-F. 2020. What makes tree poachers give up? A case study of forestry law enforcement in Taiwan. *Environmental Conservation*. **47**(1), pp.67–73.

Islam, M.M. 2021. Social Dimensions in Designing and Managing Marine Protected Areas in Bangladesh. *Human Ecology*. **49**(2), pp.171–185.

Jachmann, H. 2008a. Illegal wildlife use and protected area management in Ghana. *Biological Conservation*. **141**(7), pp.1906–1918.

Jachmann, H. 2008b. Monitoring law-enforcement performance in nine protected areas in Ghana. *Biological Conservation*. **141**(1), pp.89–99.

Kahler, J.S., Rivera, J.W., Steele, Z.T., Morales-Giner, P., Rivera, C.J., Ahossin, C.F., Kaur, A. and Episcopio-Sturgeon, D.J. 2021. Advancing Applied Research in Conservation Criminology Through the Evaluation of Corruption Prevention, Enhancing Compliance, and Reducing Recidivism. *Frontiers in Conservation Science*. **2**, 698755.

Kairu, A., Upton, C., Huxham, M., Kotut, K., Mbeche, R. and Kairo, J. 2018. From Shiny Shoes to Muddy Reality: Understanding How Meso-State Actors Negotiate the Implementation Gap in Participatory Forest Management. *Society & Natural Resources*. **31**(1), pp.74–88.

Kaplow, L. 1990. A note on the optimal use of nonmonetary sanctions. *Journal of Public Economics*. **42**(2), pp.245–247.

Keane, A., Jones, J.P.G. and Milner-Gulland, E.J. 2011. Encounter data in resource management and ecology: pitfalls and possibilities. *Journal of Applied Ecology*. **48**(5), pp.1164–1173.

Malik, A.S. 1990. Avoidance, Screening and Optimum Enforcement. *The RAND Journal of Economics*. **21**(3), pp.341–353.

Mangubhai, S., Saleh, M., Suprayitno, Muljadi, A., Purwanto, Rhodes, K.L. and Tjandra, K. 2011. Do Not Stop: The Importance of Seamless Monitoring and Enforcement in an Indonesian Marine Protected Area. *Journal of Marine Biology*. **2011**, pp.1–11.

Martin, E., Martin, C. and Vigne, L. 2013. Successful reduction in rhino poaching in Nepal. *Pachyderm*. **54**, pp.67–74.

Massé, F. 2020. Conservation Law Enforcement: Policing Protected Areas. *Annals of the American Association of Geographers*. **110**(3), pp.758–773.

Matseketsa, G., Krüger, K. and Gandiwa, E. 2022. Rule-breaking in terrestrial protected areas of sub-Saharan Africa: A review of drivers, deterrent measures and implications for conservation. *Global Ecology and Conservation*. **37**, e02172.

Meduna, A.J., Ogunjinmi, A.A. and Onadeko, S.A. 2009. Biodiversity conservation problems and their implications on ecotourism in Kainji Lake National Park, Nigeria. *Journal of Sustainable Development in Africa*. **10**(4), pp.59–73.

Milliman, S.R. 1986. Optimal fishery management in the presence of illegal activity. *Journal of Environmental Economics and Management*. **13**(4), pp.363–381.

Milner-Gulland, E.J. and Leader-Williams, N. 1992. A Model of Incentives for the Illegal Exploitation of Black Rhinos and Elephants: Poaching Pays in Luangwa Valley, Zambia. *Journal of Applied Ecology*. **29**(2), pp.388–401.

Moneron, S., Armstrong, A. and Newton, D. 2020. *The people beyond the poaching: interviews with convicted offenders in South Africa* [Online]. Cambridge, United Kingdom: TRAFFIC International. Available from: https://www.traffic.org/beyond-the-poaching/.

Moon, R. and Conway, F. 2016. Does the relationship between fishermen and enforcers impact regulatory compliance? *Marine Policy*. **74**, pp.316–322.

Moore, J.F., Mulindahabi, F., Masozera, M.K., Nichols, J.D., Hines, J.E., Turikunkiko, E. and Oli, M.K. 2018. Are ranger patrols effective in reducing poaching-related threats within protected areas? *Journal of Applied Ecology*. **55**(1), pp.99–107.

Moore, J.F., Udell, B.J., Martin, J., Turikunkiko, E. and Masozera, M.K. 2021. Optimal allocation of law enforcement patrol effort to mitigate poaching activities. *Ecological Applications*. **31**(5), e02337.

Moreto, W.D. 2016. Occupational stress among law enforcement rangers: insights from Uganda. *Oryx*. **50**(4), pp.646–654.

Moreto, W.D., Brunson, R.K. and Braga, A.A. 2017. ‘Anything We Do, We Have to Include the Communities’: Law Enforcement Rangers’ Attitudes Towards and Experiences of Community–Ranger Relations in Wildlife Protected Areas in Uganda. *The British Journal of Criminology*. **57**(4), pp.924–944.

Moreto, W.D., Brunson, R.K. and Braga, A.A. 2015. ‘Such Misconducts Don’t Make a Good Ranger’: Examining Law Enforcement Ranger Wrongdoing in Uganda. *The British Journal of Criminology*. **55**(2), pp.359–380.

Moreto, W.D., Gau, J.M., Paoline, E.A., Singh, R., Belecky, M. and Long, B. 2019. Occupational motivation and intergenerational linkages of rangers in Asia. *Oryx*. **53**(3), pp.450–459.

Moreto, W.D. and Lemieux, A.M. 2015. Poaching in Uganda: Perspectives of Law Enforcement Rangers. *Deviant Behavior*. **36**(11), pp.853–873.

Moreto, W.D., Lemieux, A.M. and Nobles, M.R. 2016. ‘It’s in my blood now’: the satisfaction of rangers working in Queen Elizabeth National Park, Uganda. *Oryx*. **50**(4), pp.655–663.

Moreto, W.D. and Matusiak, M.C. 2017. “We Fight against Wrong Doers”: Law Enforcement Rangers’ Roles, Responsibilities, and Patrol Operations in Uganda. *Deviant Behavior*. **38**(4), pp.426–447.

Ogunjinmi, A.A., Umunna, M.O. and Ogunjinmi, K.O. 2008. Factors Affecting Job Satisfaction Of Rangers In Yankari Game Reserve, Bauchi, Nigeria. *Journal of Agriculture and Social Research (JASR)*. **8**(2).

Oliver, W.M. and Meier, C. 2006. “Duck cops”, “game wardens”, and “wildlife enforcement:” stress among conservation officers. *Applied Psychology in Criminal Justice*. **2**(1), pp.1–25.

Ostrom, E. 2000. Collective Action and the Evolution of Social Norms. *The Journal of Economic Perspectives*. **14**(3), pp.137–158.

Oyanedel, R., Gelcich, S. and Milner-Gulland, E.J. 2020. Motivations for (non-)compliance with conservation rules by small-scale resource users. *Conservation Letters*. **13**(5), e12725.

Parker, B., Hoﬀmann, M., Singh, R., McVey, D. and Ruiz, L. 2022. Short Communication: Governance type bias in global ranger survey: Implications for relevance and analogous future works. *PARKS*. **28**(1), pp.71–76.

Paul Mmahi, O. and Usman, A. 2020. “Hunting Is Our Heritage; We Commit No Offence”: Kainji National Park Wildlife Poachers, Kaiama, Kwara State Nigeria. *Deviant Behavior*. **41**(12), pp.1510–1523.

Pendleton, M.R. 1998. Policing the Park: Understanding Soft Enforcement. *Journal of Leisure Research*. **30**(4), pp.552–571.

Plumptre, A.J., Fuller, R.A., Rwetsiba, A., Wanyama, F., Kujirakwinja, D., Driciru, M., Nangendo, G., Watson, J.E.M. and Possingham, H.P. 2014. Efficiently targeting resources to deter illegal activities in protected areas. *Journal of Applied Ecology*. **51**(3), pp.714–725.

Pomeroy, R.S., Mascia, M.B. and Pollnac, R.B. 2006. Marine Protected Areas: The Social Dimension *In*: *Background Paper 3*. Rome, Italy, pp.149–175.

Poppe, J. 2012. Conservation’s Ambiguities: Rangers on the Periphery of the W Park, Burkina Faso. *Conservation and Society*. **10**(4), pp.330–343.

Prinsloo, D., Riley-Smith, S. and Newton, D. 2020. *Trading Years for Wildlife: An investigation into wildlife crime from the perspectives of offenders in Namibia* [Online]. Cambridge, United Kingdom: TRAFFIC International. Available from: https://www.traffic.org/publications/reports/trading-years-for-wildlife-interviews-with-offenders-convicted-of-wildlife-crimes-in-namibia/.

Read, A.D., West, R.J., Haste, M. and Jordan, A. 2011. Optimizing voluntary compliance in marine protected areas: A comparison of recreational fisher and enforcement officer perspectives using multi-criteria analysis. *Journal of Environmental Management*. **92**(10), pp.2558–2567.

Reynald, D.M. 2011. Factors Associated with the Guardianship of Places: Assessing the Relative Importance of the Spatio-Physical and Sociodemographic Contexts in Generating Opportunities for Capable Guardianship. *Journal of Research in Crime and Delinquency*. **48**(1), pp.110–142.

Roe, D. 2017. *Taking action against wildlife crime in Uganda: balancing law enforcement with community engagement - U-PCLG Policy Brief* [Online]. London: IIED. Available from: https://pubs.iied.org/g04133.

Rowcliffe, J.M., de Merode, E. and Cowlishaw, G. 2004. Do Wildlife Laws Work? Species Protection and the Application of a Prey Choice Model to Poaching Decisions. *Proceedings: Biological Sciences*. **271**(1557), pp.2631–2636.

Sarkar, D., Bortolamiol, S., Gogarten, J.F., Hartter, J., Hou, R., Kagoro, W., Omeja, P., Tumwesigye, C. and Chapman, C.A. 2022. Exploring multiple dimensions of conservation success: Long-term wildlife trends, anti-poaching efforts and revenue sharing in Kibale National Park, Uganda. *Animal Conservation*.

Seager, J., Bowser, G. and Dutta, A. 2021. Where are the women? Towards gender equality in the ranger workforce. *Parks Stewardship Forum*. **37**(1), pp.206–218.

Sethi, S. 2021. Insights into illegal wildlife hunting by forest guards of selected tiger reserves in Central India. *European Journal of Wildlife Research*. **68**, 4.

Singh, R., Gan, M. and Barlow, C. 2020. What do rangers feel? Perceptions from Asia, Africa and Latin America. *PARKS*. (26.1), pp.63–76.

Sjöstedt, M. and Linell, A. 2021. Cooperation and coercion: The quest for quasi-voluntary compliance in the governance of African commons. *World Development*. **139**, 105333.

Solomon, J.N., Gavin, M.C. and Gore, M.L. 2015. Detecting and understanding non-compliance with conservation rules. *Biological Conservation*. **189**, pp.1–4.

Spira, C., Kirkby, A.E. and Plumptre, A.J. 2019. Understanding ranger motivation and job satisfaction to improve wildlife protection in Kahuzi–Biega National Park, eastern Democratic Republic of the Congo. *Oryx*. **53**(3), pp.460–468.

St. John, F.A.V., Keane, A.M., Jones, J.P.G. and Milner-Gulland, E.J. 2014. FORUM: Robust study design is as important on the social as it is on the ecological side of applied ecological research. *Journal of Applied Ecology*. **51**(6), pp.1479–1485.

St John, F.A.V., Keane, A.M. and Milner-Gulland, E.J. 2013. Effective conservation depends upon understanding human behaviour *In*: D. W. Macdonald and K. J. Willis, eds. *Key Topics in Conservation Biology 2* [Online]. John Wiley & Sons, Ltd, pp.344–361. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118520178.ch19.

Steinmetz, R., Srirattanaporn, S., Mor-Tip, J. and Seuaturien, N. 2014. Can community outreach alleviate poaching pressure and recover wildlife in South-East Asian protected areas? *Journal of Applied Ecology*. **51**(6), pp.1469–1478.

Stigler, G.J. 1970. The Optimum Enforcement of Laws. *Journal of Political Economy*. **78**(3), pp.526–536.

Sutinen, J.G. 1987. Enforcement of the MFCMA: An Economist’s Perspective. *Marine Fisheries Review*. **49**(3), pp.36–43.

Tegegne, Y.T., Ramcilovic-Suominen, S., Kotilainen, J., Winkel, G., Haywood, A. and Almaw, A. 2022. What drives forest rule compliance behaviour in the Congo Basin? A study of local communities in Cameroon. *Land Use Policy*. **115**, 106012.

Tillyer, M.S. and Eck, J.E. 2011. Getting a handle on crime: A further extension of routine activities theory. *Security Journal*. **24**(2), pp.179–193.

Travers, H., Archer, L.J., Mwedde, G., Roe, D., Baker, J., Plumptre, A.J., Rwetsiba, A. and Milner-Gulland, E.J. 2019. Understanding complex drivers of wildlife crime to design effective conservation interventions. *Conservation Biology*. **33**(6), pp.1296–1306.

Travers, H., Mwedde, G., Archer, L., Roe, D., Plumptre, A., Baker, J., Rwetsiba, A. and Milner-Gulland, E.J. 2017. *Taking action against wildlife crime in Uganda* [Online]. London: IIED. Available from: https://pubs.iied.org/17604iied.

Vasan, S. 2002. Ethnography of the Forest Guard: Contrasting Discourses, Conflicting Roles and Policy Implementation. *Economic and Political Weekly*. **37**(40), pp.4125–4133.

Wellsmith, M. 2011. Wildlife Crime: The Problems of Enforcement. *European Journal on Criminal Policy and Research*. **17**(2), pp.125–148.

Woodside, D.P., Vasseleu, J., Pyke, T.W., Wilson-Holt, O. and Roe, D. 2021. Building healthy relationships between rangers and communities in and around protected areas. *Parks Stewardship Forum*. **37**(1), pp.153–173.

***Bibliography of the community policing literature***

Bullock, K. 2013. Community, intelligence-led policing and crime control. *Policing and Society*. **23**(2), pp.125–144.

Cordner, G. 2014. Community Policing *In*: *The Oxford Handbook of Police and Policing* [Online]. Oxford Handbooks. Oxford University Press, pp.148–171. Available from: https://academic.oup.com/edited-volume/34517.

Grinc, R.M. 1994. “Angels in Marble”: Problems in Stimulating Community Involvement in Community Policing. *Crime & Delinquency*. **40**(3), pp.437–468.

Hawdon, J. and Ryan, J. 2011. Neighborhood Organizations and Resident Assistance to Police. *Sociological Forum*. **26**(4), pp.897–920.

Pattavina, A., Byrne, J.M. and Garcia, L. 2006. An Examination of Citizen Involvement in Crime Prevention in High-Risk Versus Low- to Moderate-Risk Neighborhoods. *Crime & Delinquency*. **52**(2), pp.203–231.

Rosenbaum, D.P. 1988. Community crime prevention: A review and synthesis of the literature. *Justice Quarterly*. **5**(3), pp.323–395.

Sabet, D.M. 2014. *Co-Production and Oversight: Citizens and Their Police* [Online]. Available from: https://www.wilsoncenter.org/publication/co-production-and-oversight-citizens-and-their-police.

Sjöstedt, M., Sundström, A., Jagers, S.C. and Ntuli, H. 2021. *Governance through community policing: What makes citizens report poaching of wildlife to state officials?* [Online]. The Quality of Government Institute. Available from: https://gupea.ub.gu.se/handle/2077/69914.

Smith, B.W., Novak, K.J. and Hurley, D.C. 1997. Neighborhood Crime Prevention: The Influences of Community-Based Organizations and Neighborhood Watch. *Journal of Crime and Justice*. **20**(2), pp.69–86.