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Conservation Biology

DIVERSITY

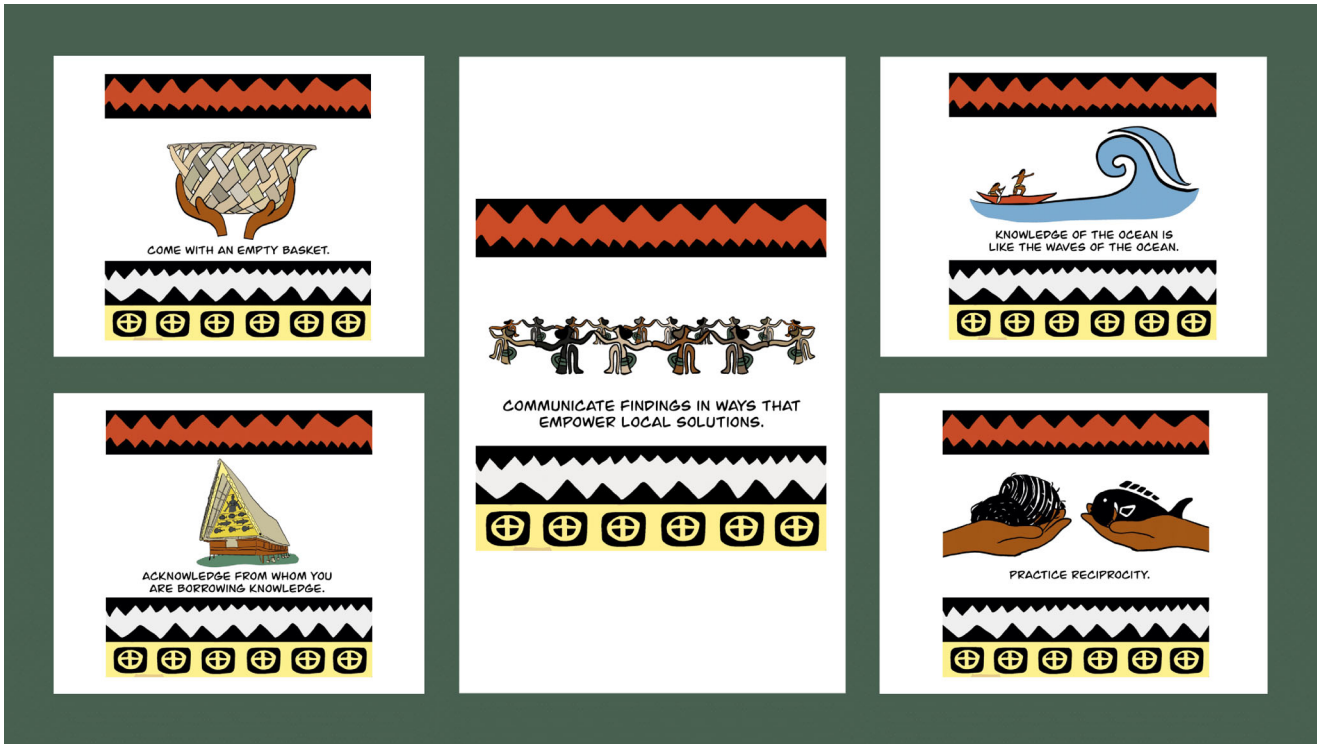
Lessons from Palau to end parachute science in international conservation research

INTRODUCTION

Conservation science is having a reckoning with "parachute science" (Belhabib, 2021; de Vos, 2020; Naepi, 2019; Stefanoudis et al., 2021; Trisos et al., 2021). In the parachute science model, scientists drop into a foreign country with preconceived notions, seeking to validate their assumptions without genuine engagement with local people, ideas, epistemologies, methodologies, and knowledges, and leave without giving back to the place from which they extracted. This model lacks integrity and produces dubious results with little value to local populations and can even undermine local efforts. We share five principles for international conservation research beyond the parachute, rooted in Palauan epistemologies (Image 1). We draw from our firsthand experience with both parachute and non-parachute science in Palau as an Indigenous Palauan researcher and a white American researcher partnering on conservation science. In this alternative approach, to gain knowledge requires cultivating relationships and earning trust from a place of humility in order to borrow knowledge with integrity for communal benefit.

THE VALUE OF INTERNATIONAL RESEARCH PARTNERSHIPS

For both local and international conservationists, there is value in partnership. For international researchers, partnership is not only the ethical approach to working in foreign countries, but it also yields practical benefits: partnering produces more culturally competent planning and solutions, increases engagement with local knowledge holders—including local people trained in Western science, reduces conflict within communities, and increases the legitimacy of conservation solutions (Bennett & Dearden, 2014; Brechin et al., 2002; Heck et al., 2012; Rai et al., 2021). For local researchers, partnerships can bring additional human and financial capacity, including technical or methodological expertise that is not available locally, and provide an opportunity to teach outsiders about local ways of knowing and interacting with the environment. Partnering with international scholars can also increase the reach of local efforts and bring greater attention—and funding—to local issues.



LESSONS FROM PALAU

Come with an empty basket

Bechachongii a sualem e mei.

"Come with an empty basket."

To come with an empty basket, seeking to fill it, orients researchers in an attitude of humility, curiosity, and respect for local values, needs, practices, and expertise. The history of conservation is riddled with examples of international actors arriving in distant communities with their baskets already full of mission statements, research questions, project objectives, methodologies, and solutions that they apply across contexts, often inappropriately and against the wishes of local people. For example, "fortress conservation," a Western approach to protecting "wilderness" through the exclusion of human activity, has generated harm in communities across the globe (Rai et al., 2021). A researcher arriving with an empty basket listens before acting, recognizing that environmental values are not universal, that conservation can take different forms, and that local needs and values need to be prioritized to avoid reproducing harms.

Knowledge of the ocean is like the waves of the ocean

Tekoi el ua Iuul.

"Like the waves of the ocean, all knowledge comes in different sizes and shapes, but never does one wave overcome another, and in the end all will arrive at the same destination."

This proverb means that no two fishers will have the same knowledge of the ocean, based on their diversity of experiences, removing any notion of knowledge supremacy. This proverb calls researchers to recognize the value of local ecological knowledges and to engage with a diversity of knowledge holders. Although the value of local ecological knowledges is increasingly recognized in conservation science (Aswani et al., 2018), they are still regularly marginalized relative to Western scientific knowledge (Trisos et al., 2021). Conversely, international academics are often perceived by local people to lack contextualized knowledge, and their knowledge may be easily discredited (Kourantidou et al., 2020). Engaging with only one kind of local knowledge holder, for example, only local elites, only men, or only one institution, ignores valuable knowledge and risks reproducing local inequities (Taylor, 2017). No community is monolithic, and individuals' power and knowledge depend on their intersecting identities (Crenshaw, 1989). Broadening what kinds of expertise are valued in conservation research expands the knowledge base from which to draw to design just and effective solutions.

Furthermore, not all knowledge is meant for sharing. Researchers should bear in mind when asking questions about potentially sensitive, secretive, or sacred topics the possibility that misleading information may intentionally be given to guard knowledge. In Palau, secret knowledge is said to be passed "like the juice of a young coconut," from one dark space into another, without being exposed to the light (Asang, 2004). Making guarded knowledge public betrays trust, can have negative ramifications for future research efforts (Singeo, 2020), and can have unintended consequences for access to natural resources.

Acknowledge from whom you are borrowing knowledge

Meleng a Tekoi.

"Acknowledge from whom you are borrowing knowledge."

Authorship is the currency of academia (Liboiron et al., 2017), yet a failure to recognize diverse contributions has led to the exclusion of local researchers from much of the published literature (Cooke et al., 2021; Stefanoudis et al., 2021), by not including local researchers as co-authors where it would have been appropriate and local researchers not being first or last authors (Morton et al., 2022; Rayadin & Buřivalová, 2022). Writing—the task that academics are specifically trained to do—is frequently valued above other contributions in author order, a ranking that perpetuates power inequities (Trisos et al., 2021). Cooke et al. (2021) advocate for a more inclusive approach that includes securing permissions, team building, and training, among other contributions.

Yet not all individuals benefit from authorship equally. Liboiron et al. (2017) consider whether the individual is an academic, who needs the capital most (e.g., seeking a job or tenure), and the number of publications an author already has when determining author order. Furthermore, token authorship, in which a local individual is listed for appearances without genuine engagement, is another manifestation of parachute science and can be a disservice.

Practice reciprocity

Kemanget imal.

"Practice reciprocity."

Reciprocity, or exchange for mutual benefit, is foundational to the Palauan value system. International scientists benefit through knowledge production, publication, and associated accolades. Reciprocity is about ensuring that local people engaged in research receive equal or greater benefits, including the development of scientific capacity locally so that communities are not dependent on outside expertise to execute research (Naepi, 2019). "Capacity building" in conservation is too often shallow, such as training local field assistants in data collection but not research design or analysis. Reciprocity requires

the development of local people as equal and independent researchers (Trisos et al., 2021), for example, by fully integrating them into the research team, supervising local students, and providing or co-applying for research funds. Additionally, researchers can uplift scholars from local communities by including them in their reading and references lists (Trisos et al., 2021).

Communicate findings in ways that empower local solutions

> *Tekoi el Beluu.*
>
> *"Become words of the land (something of value to the community)."*

Although academic publications are an important tool for communicating research results with the scholarly community, they are not sufficient for reaching nonacademic participants and affected parties, and in isolation they are unlikely to lead to locally driven solutions to conservation challenges. In addition to academic publications, international partners should work under the guidance of local research partners to aid in the development of locally relevant and culturally appropriate communication materials. Such materials can empower local decision makers to develop their own conservation policies. These materials may take the form of community meetings, written materials in the local language, art projects (Spiegel, 2020), short films (Finkler & León-Anguiano, 2019), and social media campaigns (Wu et al., 2018).

CONCLUSIONS

Parachute science has been a norm in conservation research for decades, and moving beyond the parachute is not always easy or rewarded. Universities, funding agencies, and journals can reinforce the parachute model by, for instance, narrowly recognizing citations as the metric of scientific contribution, ignoring the community engagement, inclusion, mentoring, and collaboration that help to break down the parachute model (Davies et al., 2021). We must all unlearn harmful practices, cultivate new relationships, and reimagine a way beyond the parachute. Critically, scientific institutions must also demand and reward the ethical practice of conservation research.

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REFERENCES

Asang, I. M. (2004). *Epistemological articulations: Blebaol, Klomengelungel ma Tekoi er Belau* (Dissertation). University of Hawai'i at Manoa.

Aswani, S., Lemahieu, A., & Sauer, W. H. (2018). Global trends of local ecological knowledge and future implications. *PLoS ONE*, *13*(4), e0195440.

Belhabib, D. (2021). Ocean science and advocacy work better when decolonized. *Nature Ecology & Evolution*, *5*, 709–710. https://doi.org/10.1038/s41559-021-01477-1

Bennett, N. J., & Dearden, P. (2014). Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand. *Marine Policy*, *44*, 107–116.

Brechin, S. R., Wilshusen, P. R., Fortwangler, C. L., & West, P. C. (2002). Beyond the square wheel: Toward a more comprehensive understanding of biodiversity conservation as social and political process. *Society & Natural Resources*, *15*(1), 41–64.

Cooke, S. J., Nguyen, V. M., Young, N., Reid, A. J., Roche, D. G., Bennett, N. J., Rytwinski, T., & Bennett, J. R. (2021). Contemporary authorship guidelines fail to recognize diverse contributions in conservation science research. *Ecological Solutions and Evidence*, *2*(2), e12060.

Crenshaw, K. (1989). *Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics*. Routledge.

Davies, S. W., Putnam, H. M., Ainsworth, T., Baum, J. K., Bove, C. B., Crosby, S. C., Côté, I. M., Duplouy, A., Fulweiler, R. W., Griffin, A. J., Hanley, T. C., Hill, T., Humanes, A., Mangubhai, S., Metaxas, A., Parker, L. M., Rivera, H. E., Silbiger, N. J., Smith, N. S., … Bates, A. E. (2021). Promoting inclusive metrics of success and impact to dismantle a discriminatory reward system in science. *PLoS Biology*, *19*(6), e3001282. https://doi.org/10.1371/journal.pbio.3001282

de Vos, A. (2020). *The problem of 'colonial science'*. Scientific American. https://www.scientificamerican.com/article/the-problem-of-colonial-science/

Finkler, W., & León-Anguiano, B. (2019). The power of storytelling and video: A visual rhetoric for science communication. *Journal of Scientific Communication*, *18*(5), A02.

Heck, N., Dearden, P., & McDonald, A. (2012). Insights into marine conservation efforts in temperate regions: Marine protected areas on Canada's West Coast. *Ocean & Coastal Management*, *57*, 10–20.

Kourantidou, M., Hoover, C., & Bailey, M. (2020). Conceptualizing indicators as boundary objects in integrating Inuit knowledge and western science for marine resource management. *Arctic Science*, *6*(3), 279–306. https://doi.org/10.1139/as-2019-0013

Liboiron, M., Ammendolia, J., Winsor, K., Zahara, A., Bradshaw, H., Melvin, J., Mather, C., Dawe, N., Wells, E., & Liboiron, F. (2017). Equity in author order: A feminist laboratory's approach. *Catalyst: Feminism, Theory, Technoscience*, *3*(2), 1–17.

Morton, B., Vercueil, A., Masekela, R., Heinz, E., Reimer, L., Saleh, S., Kalinga, C., Seekles, M., Biccard, B., Chakaya, J., Abimbola, S., Obasi, A., & Oriyo, N. (2022). Consensus statement on measures to promote equitable authorship

in the publication of research from international partnerships. *Anaesthesia*, *77*(3), 264–276.

Naepi, S. (2019). Pacific research methodologies. In Noblit, G. (Ed.), *Oxford research encyclopedia of education* (pp. 1–17). Oxford University Press.

Rai, N. D., Devy, M. S., Ganesh, T., Ganesan, R., Setty, S. R., Hiremath, A. J., Khaling, S., & Rajan, P. D. (2021). Beyond fortress conservation: The long-term integration of natural and social science research for an inclusive conservation practice in India. *Biological Conservation*, *254*, 108888.

Rayadin, Y., & Buřivalová, Z. (2022). What does it take to have a mutually beneficial research collaboration across countries? *Conservation Science and Practice*, *4*(5), e528. https://doi.org/10.1111/csp2.528

Singeo, K. U. (2020). *(Re)engaging indigeneity in planning: Epistemological conflicts and women's human rights in Palau* (PhD thesis). University of Hawai'i.

Spiegel, S. J. (2020). Visual storytelling and socioenvironmental change: Images, photographic encounters, and knowledge construction in resource frontiers. *Annals of the American Association of Geographers*, *110*(1), 120–144.

Stefanoudis, P. V., Licuanan, W. Y., Morrison, T. H., Talma, S., Veitayaki, J., & Woodall, L. C. (2021). Turning the tide of parachute science. *Current Biology*, *31*(4), R184–R185. https://doi.org/10.1016/j.cub.2021.01.029

Taylor, S. R. (2017). Issues in measuring success in community-based Indigenous tourism: Elites, kin groups, social capital, gender dynamics and income flows. *Journal of Sustainable Tourism*, *25*(3), 433–449.

Trisos, C. H., Auerbach, J., & Katti, M. (2021). Decoloniality and anti-oppressive practices for a more ethical ecology. *Nature Ecology & Evolution*, *5*, 1205–1212.

Wu, Y., Xie, L., Huang, S. L., Li, P., Yuan, Z., & Liu, W. (2018). Using social media to strengthen public awareness of wildlife conservation. *Ocean & Coastal Management*, *153*, 76–83.

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