

**A PRELIMINARY BASELINE STUDY OF DEVELOPMENT FUNDING TO SUPPORT
INDIGENOUS PEOPLES AND LOCAL COMMUNITY-LED RESEARCH AND
RESEARCH INSTITUTIONS IN LOW AND MIDDLE-INCOME COUNTRIES**

by

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1.0 Introduction

Some nations, research institutions, and international organizations have finally, after centuries of discrimination, recognized that Indigenous Peoples and Local Communities (IP&LCs) are essential actors in protecting and restoring nature and governing rural and remote areas across the planet (Dawson et al., 2021). The United Nations defined Indigenous Peoples in the 1980s as those human groups who have a historical continuity in a territory, a distinct culture, and who recognize themselves as indigenous (Marc Hufty, 2020), but the most cited description was outlined in Jose Martinez Cobo's study, where the working definition reads as "those that have historical continuity with pre-invasion and pre-colonial societies that developed on their territories and consider themselves distinct from other sectors of the societies now prevailing on those territories or parts of them. They form, at present, non-dominant sectors of society and are determined to preserve, develop, and transmit to future generations their ancestral territories and their ethnic identity as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions, and legal system" (OHCHR, 2001; UNPFI, 2021). Despite their cultural differences, "Indigenous Peoples from around the world share common problems related to the protection of their rights as distinct peoples" (UN, 2020). In contrast, a Local Community is a self-identified human group that shares a collective connection to their living environment, helping to shape a shared territory and culture.

Members of Local Communities often have frequent, direct encounters, potentially face-to-face, and share a common history, traditions, institutions, language, values, and plans (IPBES, 2020). Despite their political and historical differences, Indigenous Peoples and Local Communities from around the world share common problems related to the protection of their rights. For years, IP&LC have sought recognition of their identities, way of life, and right to traditional lands, territories, and natural resources, yet throughout history, IP&LC's rights have been violated (UNDESA, 2022).

Indigenous Peoples and Local Communities (IP&LCs) play a crucial role in the conservation and sustainable utilization of natural resources, innovations, and values that support biodiversity and should be recognized as key stakeholders and decision-makers, acknowledge their significant historical and current contributions to conservation, and support their rights and

governance authority (Borrini-Feyerabend et al., 2013). However, the increased pace of globalization, industrialization, and trade liberalization has exacerbated these vulnerabilities further, leading to even greater risks for marginalized communities and significant social, economic, and political challenges (Mishra et al., 2021). Indigenous Peoples and Local Communities worldwide have deep and intrinsic relationships with their lands and natural resources, and they have legitimate land rights to between 50% and 65% of the global landmass (RRI, 2017). Despite this significant extent, their rights are only legally recognized for 11.4% of the global landmass (RRI, 2023).

Despite having their economic viability attacked by colonialism and capitalist exploitation (Youdelis et al., 2021), IP&LCs are growing in political and economic strength in many arenas (RRI, 2022). Local institutions such as forest gardens, sustainable use regulations, restoration activities, and prevention of external encroachment reflect IP&LCs' strong motivation to conserve the environment (Dawson et al., 2021) but IP&LCs work with few resources and support to advance their science and the development of their young researchers, analysts, and activists—the next generation of leaders (Bridgewater et al., 2015; Dawson et al., 2021)—with too little funding flowing directly to their organizations (FTFG, 2022). In its report (2022), the Ford Foundation acknowledged the need for further progress in funding IP&LC organizations. For example, the report highlighted that the percentage of committed funding directly benefiting IPLC organizations and networks in 2021 stands at 17%, which is below both the Foundation's aspirations and the expectations of its partners. As the Foundation continues to work with other grantmaking entities, funds, and nonprofit collaborators endorsed by IP&LC organizations, there must be a clear intention to increase the proportion of funding directed towards IP&LCs (Ford Foundation, 2022).

The overarching goal of this project is to develop a baseline analysis of the current international development funding allocated to IP&LC-led research in Low and Middle-Income Countries (LMICs). This will support the Pathway Alliance for Change and Transformation (PACT) in building the case for much greater financial and technical support for IP&LC-led research organizations, their young scholars, and their allied organizations.

1.1 Statement of the Problem

IP&LC-led research is essential because IP&LCs have strong and extensive knowledge—indeed, stronger than others—to their particular land, cultures, and ways of life (Nakashima et al., 2021; Sobrevila, 2008). IP&LCs have an in-depth understanding of their environments, cultures, strengths, and challenges, along with proven practices for sustainably managing and restoring lands and ecosystems (UNDESA, 2009). They have science, ideas, and innovations that everyone can learn from and provide invaluable insights into development efforts (Cajete, 2020). However, according to RRI (2020), there is clear evidence that Official Development Assistance (ODA) has prioritized conventional Western science over IP&LC knowledge and practices, and thus, they and the world are not benefiting from their knowledge and solutions. It is important to not only include IP&LCs in existing (colonial-dominated) decision-making processes but to directly support their own organizations and initiatives. The IP&LC-led groups, therefore, represent organizations where most leaders identify as Indigenous Peoples or Local Community members, guided by Indigenous leadership and supported by local academia. The IP&LC organizations aim to advocate for the rights of Indigenous Peoples and Local Communities, including education, self-determined development, customary land use, and natural resource management (GEF, 2022). IP&LC-led organizations are crucial in empowering local communities to enact the transformative changes necessary for their advancement. The IP&LC-led organizations acknowledge the importance of local approaches to accountability and decision-making rather than imposed systems from the global north.

There is a growing recognition of the importance of IP&LC-led research and its institutions, with a focus on indigenous knowledge and development concerns (Morgera & Tsioumani 2012), but funding has been a challenge (Arjjumend, 2018). An unknown, but certainly minuscule, fraction of funds go to locally focused research or support indigenous science and research organizations. There has not been an investigation into the financial support provided for IP&LC-led research initiatives and organizations. This is why Pathway Alliance for Change and Transformation (PACT), a small and strategic coalition of leading Indigenous Peoples and Local Community-led research and activist institutions and academic allies from the global south and north commissioned this crucial research to establish a baseline so that the world is aware of the current

level of investment in IP&LC-led research, and subsequent efforts can monitor the progress of funding for IP&LC-led research.

1.2 Research Questions

This project aims to establish a credible baseline for development assistance funds for IP&LC-led research and research institutions. To do this, we analyze global research funding, specifically the official development assistance (ODA) funding for research in the LMICs for IP&LC-led organizations.

The two research questions of this study are as follows:

1. What percentage of all official development assistance (ODA) is allocated to IP&LC-led research in LMICs from 1999 to 2022?
2. Who are the primary ODA funders providing financial support to IP&LC-led research from 1999 to 2022?

2.0 Review of Relevant Literature

2.1 Current Knowledge about Funding for IP&LC-led Research

Since 2019, the annual budget of the Consortium of International Agricultural Research Centers (CGIAR), which are non-profit research organizations financed by ODA, conducting innovative research to transform food, land, and water systems in a climate crisis and working out of 89 countries around the world, has averaged approximately US\$800 million (CGIAR,2022). In contrast, the International Foundation for Science (IFS), the world's leading international institution dedicated to financing young researchers and scholars doing research in LMICs, has received less than \$100 million in total funding since 1972 (Lele & Goswami, 2021). Research funding has historically favored established research organizations, think tanks, and academics in developed countries. However, the majority of ODA funding for research in the Global South tends to support international research organizations such as the members of the CGIAR. These organizations often focus on questions related to global public goods and Western science, prioritizing publication in international journals rather than addressing locally identified issues and

opportunities (Lancaster, 2007; McArthur & Werker, 2016). This dynamic contributes to an unequal distribution of resources, driven by the dominance of scholars from the global north in development research, including within the community of think tanks, academia, and policymakers (Birdsall et al., 2023).

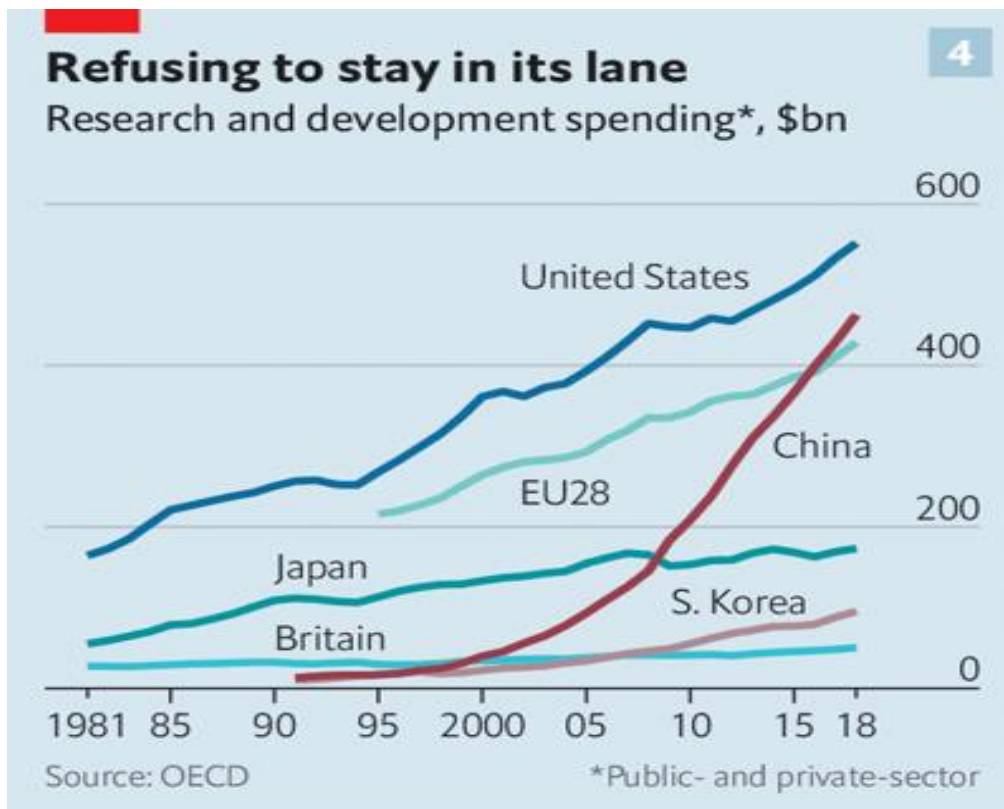
The Organization for Economic Cooperation and Development (OECD), an intergovernmental organization promoting global prosperity, operates a database housing economic data for policy coordination and analysis, together with other established international databases such as the World Bank. However, prominent world databases on ODA funds and disbursements, such as those maintained by the OECD, do not specifically collect data on research funding allocated to projects led by Indigenous Peoples and Local Communities (IP&LCs), resulting in a lack of comprehensive global estimates for such investments. The lack of category on funding for IP&LC-led research in an organized database and other donor finance databases indicates this sector's unimportance to the major donors, and this creates challenges in analyzing and generating reliable recommendations. Other potential sources of information and indicators were identified. Thus, we can examine climate and conservation funding because they have been studied to identify funding going to IP&LCs. Approximately \$270 million in climate funding was invested annually in securing IP&LC land rights and forest conservation in LMICs between 2011-2020, but only 17 percent went explicitly to Indigenous organizations (RRI-RFN, 2022).

Regarding conservation funding, according to the report by the Rights and Resources Initiative (2022) and cited by Lee (2022), Indigenous Peoples and their organizations in LMICs around the world invest nearly \$5 billion in conservation each year, representing a quarter of all conservation spending by governments, donors, foundations, and non-governmental organizations (NGOs) worldwide (RRI, 2022).

Unfortunately, IP&LC-led research institutions and their work remain essentially invisible because they have not had the capacity to document their work widely, and researchers from dominant groups have had little interest in uplifting Indigenous research and have often oppressed Indigenous communities (Datta, 2018).

2.2 Scientific Research and Development (R&D) Funding

Since 2000, the amount of funding for scientific research and development (R&D) has increased significantly globally. In 2005, the funding rose from \$725 billion to \$1 trillion, and it is estimated to have reached \$2.47 trillion in 2020 (NCSES, 2022). Research performance is concentrated in a few countries: the United States, China, Japan, Germany, South Korea, France, India, and the United Kingdom jointly accounted for about 75% of global R&D performance in 2019 (NCSES, 2022). The importance of national investment in research and development in today's global economy cannot be overstated. Accessing cutting-edge technologies developed in other countries requires a significant number of highly skilled locals, who are difficult to cultivate and retain without proper R&D funding. China's substantial R&D investment, as illustrated in Figure 1, has resulted in a considerable pool of talented and curious individuals, along with well-equipped institutions (The Economist, 2021).



The Economist

Figure 1: Research spending by selected G7 countries

Source: The Economist, 2023 (based on OECD reported data, 2019).

Research and development funding is not just provided by governments but also by corporations and philanthropists around the world. Even before the Second World War, wealthy industrialists and corporate laboratories invested heavily in scientific research in the United States. This support has greatly contributed to the success of today's American system. One example is the Rockefeller Foundation, which provides significant charitable contributions to scientific research (The Economist, 2023). These foundations allocated their funds as grants for specific, well-defined projects, like exploring the cause of yellow fever. As government funding increased after the Second World War (see Figure 2), America's government adopted a comparable funding system (The Economist, 2023).

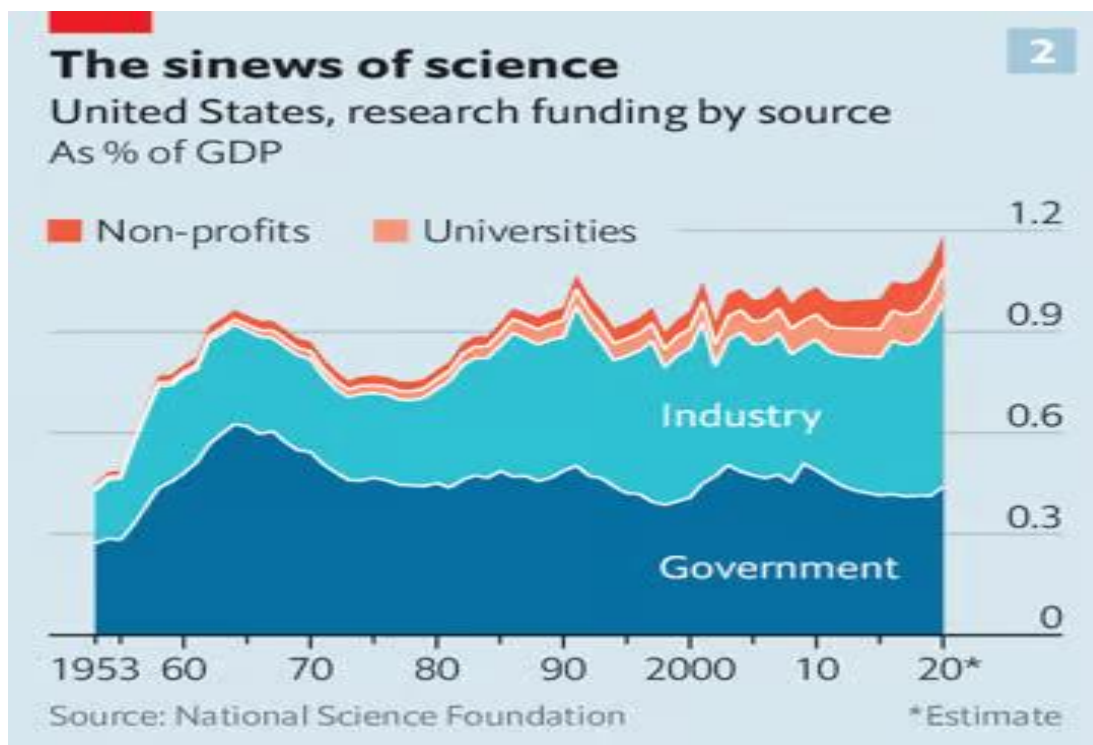


Figure 2: United States research funding by source

Source: The Economist, 2023.

The United Nations aims for developed countries to allocate 0.7% of their gross national income towards ODA (OECD, 2023). The ODA grant-equivalent methodology has been used since 2018 as a component of larger international development spending. It measures the "grant portion" of

the loan given at below-market rates. This is calculated as a percentage of gross national income and in million USD constant prices, using 2021 as the baseline year. ODA grants essentially target some of the pressing needs of developing countries, of which development assistance to IP&LC is part. There has been a gradual and sustained increase in the total amount of money given by the DAC member countries since 2018. According to the official OECD record, the total ODA from 2015 to 2022 is \$1.3 trillion (details in Fig. 3.).

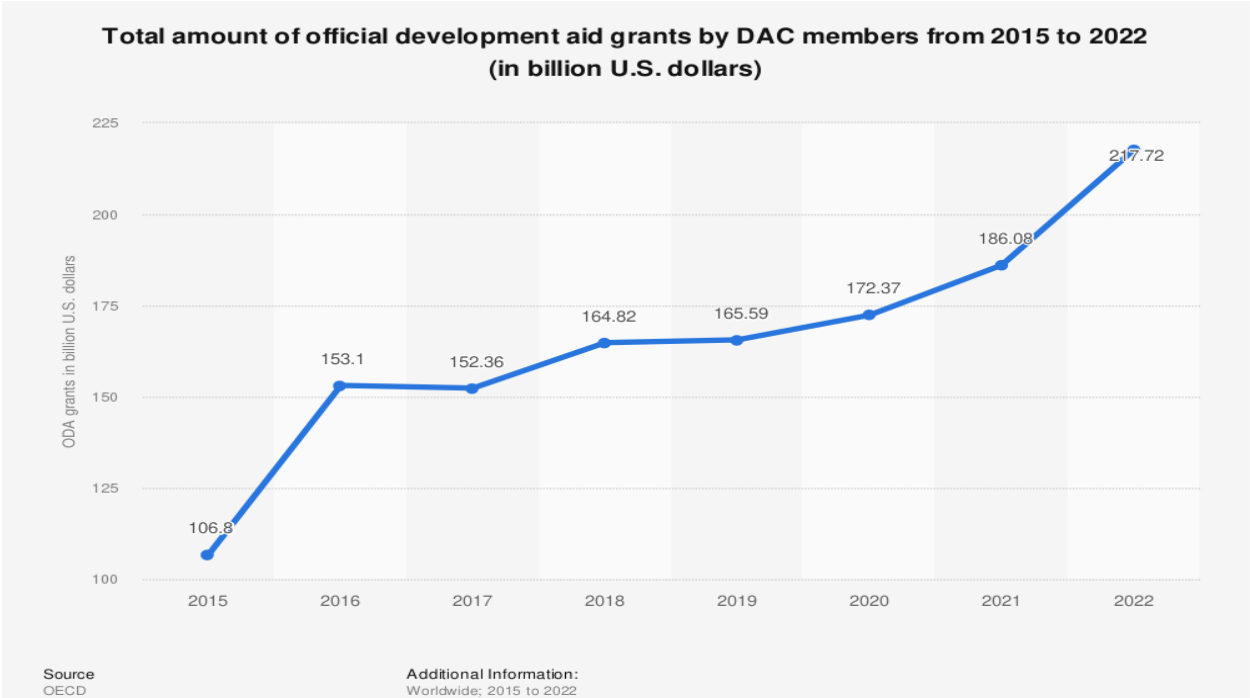
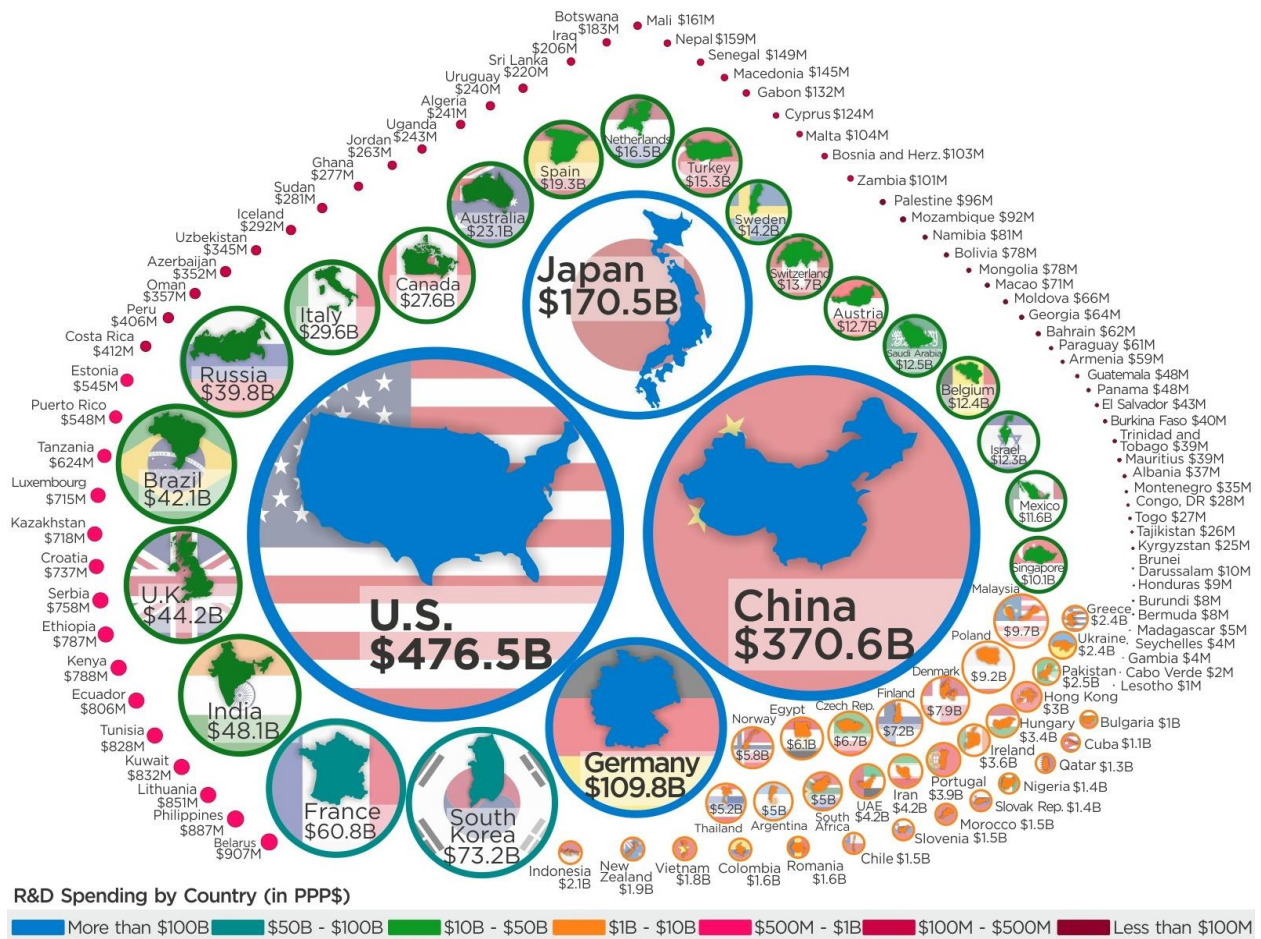


Figure 3: ODA Flows from 2015.
Source: OECD dataset on DACs ODA, 2023.

However, despite the increased aid flows, there has not been a new category for support for IP&LCs, much less for their “led” research or research institutions.



Article & Sources:
<https://howmuch.net/articles/research-development-spending-by-country>
<http://uis.unesco.org>

howmuch net

Figure 4: Global R&D Budget

Source: Jeff, 2018 (<https://www.visualcapitalist.com/money-country-puts-r-d/>)

Despite their proven cross-cutting effectiveness in preserving forestland, projects related to IP&LC tenure and forest management received significantly less donor funding when compared to other climate and environmental measures between 2011 and 2020 (RR-RFN, 2022), averaging \$270 million annually and equals less than 1% of international climate aid. Shockingly, these projects account for a mere five percent of ODA dedicated to general environmental protection and less than one percent of ODA for climate initiatives on average (RRI-RFN, 2022).

2.3 Localization

Investigating the allocation of funds to IP&LC institutions in LMICs underscores the growing importance of locally-led research in enhancing development effectiveness. This focus on 'localization' highlights a shift towards empowering these institutions to design and implement programs that best address their specific circumstances and challenges. The principle of localization is about empowering local organizations to spearhead the programs and services that meet their unique needs, thereby providing aid work that is locally led. This was corroborated when Gunjan Veda, a senior manager from the Movement for Community-led Development, said: “There is absolute empirical evidence that locally-led development is more cost-effective, more efficient, and sustainable because the local organization is so much more attuned to the needs of the community.” Indeed, some see entrusting Western donors and international organizations with all the decision-making power as a form of neocolonialism and an obstacle to achieving effective development outcomes (Devex, 2022). The concept of "localization" in the humanitarian and global development sectors has been a topic of discussion for over a decade.

However, putting this idea into practice has been challenging. The "Grand Bargain" agreement, made between some of the world's most prominent donors and humanitarian organizations at the 2016 World Humanitarian Summit, aimed to allocate at least 25% of humanitarian funding to local and national responders by the year 2020 (Devex, 2022). The Global Humanitarian Assistance (GHA) and the Development Initiative Report (2021) concluded that only 3.1% of global humanitarian funding directly supported local and national groups. That figure barely changed from 2016 (GHA, 2021). Altogether, donors spent \$217.7 billion (\$211 billion in current prices) on aid in 2022. Of this, \$52.2 billion went to multilateral agencies such as the United Nations and the World Bank (2019) and around \$109.7 billion of ODA was classified as sector-allocable aid. This refers to activities linked to a particular sector and is further classified into four main categories: social infrastructure and services, economic infrastructure and services, production sectors, and multisector or cross-cutting. In this regard, the United States Agency for International Development (USAID) is the world's largest bilateral donor and is unique in undertaking a strong commitment to localization.

More than half of the total in 2022 went to social infrastructure and services (education, health, population, and reproductive health, water supply and sanitation, government and civil society, and other social infrastructure and services such as employment and housing), worth \$64 billion (Devex, 2024).

The United States is the largest source of aid among the Development Assistance Committee (DAC) member countries. Based on preliminary data from the Organization for Economic Cooperation and Development (OECD), the United States' contribution to ODA was worth \$55.3 billion in 2022—more than a quarter of the total aid from the DAC member countries. With this significant spending, the U.S. plays an important role as a lead donor in a number of sectors and geographies.

The United States Agency for International Development (USAID) sees localization as the set of internal reforms, actions, and behavior changes undertaken to ensure the agency's work puts local actors in the lead, strengthens local systems, and is responsive to local organizations. It empowers the people, organizations, and institutions that are driving change in their own countries and communities by shifting funding and decision-making power to them. In its localization report (2023), the agency has observed that local leadership is crucial for achieving equity, effectiveness, and sustainability in development, humanitarian goals, and programming. Through localization, which involves internal reforms, actions, and behaviors, USAID aims to promote locally-led development and humanitarian response. This approach allows local actors to prioritize their own agendas, develop solutions, and mobilize their capacity, leadership, and resources to bring those solutions to life (USAID, 2023).

In 2022, Samantha Power, the Chief Administrator of USAID, emphasized the agency's vision of increasing the number of locally-led programs. Localization involves allowing local actors to design, implement, and measure projects to save lives, reduce poverty, strengthen governance, and more. It's about respecting local expertise, empowering local agencies, acknowledging their commitment and integrity, and collaborating as partners. USAID is adopting practices that reinforce locally-led development, strengthen local systems and capacities, and enhance equitable responses to local challenges (USAID, 2023). USAID has set an ambitious goal to allocate at least 25% of program funds directly to local partners by the end of 2025. This represents a significant

increase from the current funding levels, with \$1.6 billion, or 10.2%, being allocated in 2022. It is worth noting that this is the highest level of direct local funding in at least a decade, up from \$500 million, or 4.2%, in 2012 (USAID, 2023).

Furthermore, USAID will implement measures to guarantee that by the year 2030, half of all programming will empower Local Communities to take the lead in co-designing projects, establishing priorities, driving implementation, and/or evaluating the impact of programs (USAID, 2022). In 2024, the U.S. branch of Oxfam released a report called "Funding Localization Agenda," which examined USAID's funding allocation practices based on a methodology created by the British NGO "Publish What You Fund," which evaluates aid spending. According to the report, USAID's metrics were criticized for being too self-serving and not accurately reflecting the amount of funding going to local organizations (Adomako & Cohen, 2024; Devex, 2024).

Presently, access to funding from major donors often entails rigorous application and reporting procedures that smaller organizations cannot realistically fulfill. Even where funding is directed toward local organizations, there are questions about whether the money truly goes to locally-led groups (Devex, 2022). Global giving is not limited to government agencies such as USAID; numerous private foundations generously advance international financial assistance, especially in the United States. The recent edition of *The State of Global Giving by U.S. Foundations* (2022) presents insights into how these organizations contribute to vital causes such as healthcare, environmental sustainability, education, human rights, and many other issues of global significance (Council of Foundations, 2022). In 2019, US foundations granted \$8 billion for global initiatives, with health receiving the largest share at 49%. Sub-Saharan Africa, Asia, and the Pacific received the largest portion of funding. Human rights saw the fastest growth among all issue areas. The Bill and Melinda Gates Foundation was responsible for 44% of global giving by US foundations from 2016 to 2019 (Council of Foundations, 2022).

2.3.1 Constraints to Achieving Localization Goals

Addressing the constraints to achieving localization is crucial to understanding how much official development assistance (ODA) is actually reaching IP&LC-led researchers, which helps us see the funding trends. USAID has identified several challenges its partners face, including procurement, staffing, culture, risk, complexity, time, capacity, funding, and lack of access to information. These

challenges are experienced by both local and U.S.-based/international partners. A recent USAID report (2023) indicates that there are yet more obstacles to overcome, including business models, contracting, risk management, and local partner relationships. USAID sought input from over 300 stakeholders to address these issues and developed a report titled "Partners in Localization: Designing for Change." This report offers recommendations such as paying local organizations for their involvement in project design and delivery, stronger co-creation processes, better-designed bidding structures, and easier ways for partners to recover their costs (USAID, 2023; Devex, 2024). Local leaders suggest splitting procurement into two stages, with the first stage funding program research and design and the second stage funding actual implementation. A common concern is that procurement is a major challenge due to arduous applications and stringent requirements that often result in organizations being unable to bid or local partners not receiving funding even after contributing to project design, the report added.

Unfortunately, IP&LC-led research institutions and their work remain essentially invisible because they have not had the capacity to document their work widely (Jones et al., 2007), and researchers from dominant groups have had little interest in uplifting Indigenous research (KFPE, 2001; Jones et al., 2007). The Rainforest Foundation of Norway, in collaboration with RRI, unveiled a groundbreaking funding tracking tool in April 2024. Named the 'Path to Scale Funding Dashboard,' it marks a significant milestone as the first-ever tool specifically engineered to monitor donor disbursements to Indigenous Peoples and Local Communities (IP&LC) agendas and organizations. According to findings from this innovative dashboard, annual ODA investments in IP&LC have shown consistent growth, averaging \$517 million per year since 2020 and reaching approximately \$546 million in 2022 (RFN, 2024; RRI/RFN, 2024). A further \$29.6 million disbursed for all research related to Indigenous Peoples and Local Communities, was discovered through the newly launched RRI/RFN Path to Scale Funding Dashboard, which covers all ODA funding in Indigenous Peoples, Local Communities, and Afro-descendant Peoples in the Tropical Forest Countries (RRI/RFN 2024). Unfortunately, this Dashboard has no specific category for IP&LC-led research.

3.0 Methodology

3.1 Introduction

This section presents the methods used to estimate development funding to support IP&LC-led research and research institutions in LMICs.

The Organizations for Economic Co-operation and Development (OECD) and the World Bank (WB) databases are widely regarded as the most reputable and authoritative databases and are the foremost sources of information for official development assistance (ODA) from member countries of the Development Assistance Committee (DAC). A critical examination of these databases revealed a lack of specific categories for reporting IP&LC-led research. Because it was not possible to use existing databases to answer the research question, we tested a new approach, using a large language model (LLM) to estimate the ODA funding expenditures in candidate documents available online.

The donor funding from ODA to support IP&LC-led research and research institutions was extracted through a multi-step process analysis of LLM using relevant keyword searches. The generated result was compared with ODA totals for LMICs and compared with the research portfolio funding of the Consortium of International Agricultural Research Centers (CGIAR). The data available for support funding varied across different years in both the OECD and World Bank databases.

3.2 Data Collection

The methods adopted in analyzing the data collected in this work include the web-reported microdata of all official lead donors on the OECD and World Bank. URL links of donors, grant databases, and various reputable media outlets' reports on ODA from 1990 to 2022 were analyzed with the help of machine learning (LLM) to compute funding allocated to IP&LC-led research. The funding amounts were extracted and manually inspected using Google search to verify the data on related intervention projects.

Computational techniques were employed to obtain funding data for the estimated percentage of ODA allocated to IP&LC-led research in low- and middle-income countries (LMICs). To accomplish this, an automated web-scraping tool was employed to gather data containing keyword-related information for IP&LC-led research by assessing text and documents from numerous projects to identify language trends. This data was parsed to fine-tune a pre-trained large language model (LLM) to identify IP&LC-led research using semantic similarity. Web-scraping was based on the websites of bilateral and multilateral organizations, private and public donors, and newspaper databases worldwide. The analysis employs a detailed, multi-step process to accurately review the dataset, which comprises information reported by donors. The unit of search is ‘disbursement’ to track only funding that has been released. Donor organizations and news websites reported funding disbursements under a series of projects or sometimes with a single report. We parse the descriptions ‘disbursement,’ and associated documents for relevant keywords, which are "Indigenous Peoples-led research funding," "donations," "gifts," "Local Communities-led research," and "Indigenous Peoples and Local Communities-led research," "Dollar," "\$," "USD," "EUR," "JPY," "GBP," "AUD," "CAD," and "CHF."

Two large language models (LLMs) analyzed these keywords, which determined the semantic meaning of keywords from the scraped data. The two LLM models that were used include Bidirectional Encoder Representations from Transformers (BERT) and Generative Pre-trained Transformers (GPT).

We initially tested these two models using broad keywords including "Indigenous Peoples research funding," "Indigenous research," "donations," "gifts," "Local Communities research," "Indigenous Peoples-led research," "Local Communities-led research," and "Indigenous Peoples and Local Communities-led research," along with currency symbols like "\$," "USD," "EUR," "JPY," "GBP," "AUD," "CAD," and "CHF." From this test, we obtained a figure of \$94.07 million. But the GPT model process faced challenges with some heavily encrypted websites, delaying the breakthrough for several days. Additionally, the initial keywords used were too general, lacking specificity for “led” research funding, leading to inaccurate and bogus results. This resulted in the collection of all research that was denominated for Indigenous Peoples and Local communities, regardless of whether it was “led” by their organizations or not.

We subsequently used just the BERT model because it is a pre-trained model by Google with a large capacity, trained on a large corpus of text data in an unsupervised manner, and has been widely used and adapted, and we limited the keywords those including the term “led” to ensure that the analysis was collecting only disbursements to research activities that were led by IP&LC organizations. The BERT model allowed us to fine-tune supervised tasks for specific text classification to recognize entities of disbursement to IP&LC-led research funding in sentiment analysis to obtain the semantic meaning from scraped data. Websites that were not written in English were automatically switched back using Google Translate.

Generated amounts were inspected manually using Google search to validate the amount in the analysis document and ensure the money was meant for IP&LC-led research. The result was computed for each year from 1999 to 2022, and the non-dollar-denominated currencies were adjusted manually using the prevailing US dollar rate. Summaries were entered into an Excel sheet to make charts and compare with ODAs and CGIAR funding portfolios.

For question (ii), literature, books, blogs, and internet entries, as a result of computer-based LLM, were used to identify the primary ODA funders providing financial support to IP&LC-led research and organizations and verified manually with internet searches.

4.0 Presentation of Findings and Data Analysis

Graphs were used to present statistics and results of the total expenditure (government, public, and private) dedicated to funding for IP&LC-led research and research institutions.

4.1. ODA Funding Dedicated to IP&LC-led Research and Research Institutions in LMICs

Our analysis, which utilized the BERT model and targeted keywords related to IP&LC-led research funding, revealed that between 1999 and 2022, the identified funding disbursed to IP&LC-led research and institutions amounted to \$31.33 million, as illustrated in Table 1.

Table 1: Identified disbursed funding for IP&LC-led research.

Year	IP&LC-led Research Funding (\$)
1999	237,348.48
2000	330,223.98
2001	423,099.47
2002	515,974.97
2003	608,850.46
2004	980,352.44
2005	794,601.45
2006	887,476.94
2007	701,725.96
2008	1,073,227.93
2009	1,166,103.43
2010	1,258,978.92
2011	1,351,854.41
2012	1,444,729.91
2013	1,816,231.88
2014	1,630,480.90
2015	1,723,356.39
2016	1,537,605.40
2017	1,909,707.38
2018	2,001,982.87
2019	2,187,733.86
2020	2,474,258.37
2021	1,880,609.35
2022	2,393,484.85
TOTAL	31,330,000.00

Figure 4.1 depicts the result of this analysis, which detailed the disbursement of a total of \$31.33 million to IP&LC-led research and research institutions from 1999 to 2022. This graphical

representation shows the trends and distributions of financial assistance over the period, highlighting the monetary commitment to empowering local and indigenous-led research capacities in LMICs.

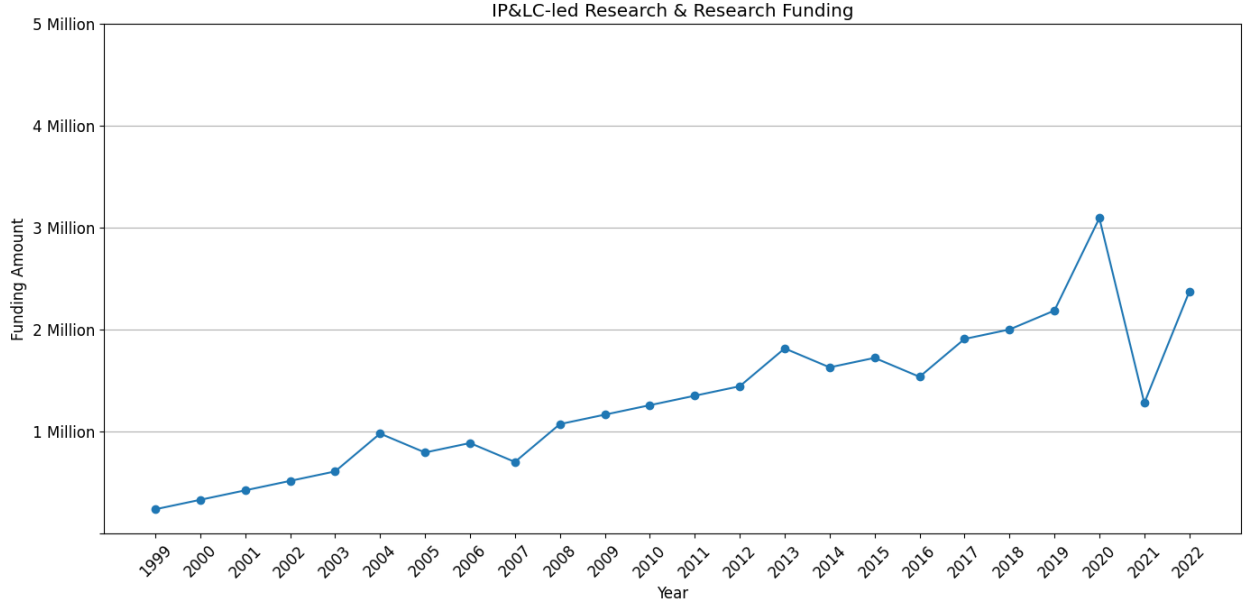


Figure 4.1: IP&LC-led research Funding.

Source: LLM Computation, 2024

4.2 ODA Funders Providing Financial Support to IP&LC-led Research

The study identified donors that have committed resources to support IP&LC research institutions and their research endeavors, including the Ford Foundation, New England Biolabs Foundation, Environmental Defense Fund, Environmental Law Institute of Washington, American Jewish World Service, Lush Cosmetics, Swift Foundation, Rising Tide Foundation, International Funders for Indigenous Peoples (IFIP), Nautilus Inc., Rainforest Foundations (UK), Christensen Foundation, The States Department (US), Forest People Program, David Weekley Family Foundation, and the Green Climate Fund (GCF). Multilateral banks and established government institutions have been found not to commit funding support to IP&LC-led research or indirectly do so through third-party organizations.

4.2.1 IP&LC-led Research, ODA and CGIAR Funding Comparisons

The amount dedicated to research globally reached \$2.47 trillion in 2022 (OECD, 2023), while total ODA between 2015 and 2022 also eclipsed \$1.3 trillion from the OECD database, but the

total global giving to Indigenous Peoples and Local Communities research and research institutions out of the trillions of dollars available for research is a paltry \$31.33 million when analyzed with a machine learning model using a combination of keywords.

The machine learning analysis focused on funding for IP&LC-led research and research institutions from 1999 to 2022. The calculation of the percentage of IP&LC-led research funding, which amounted to \$31.33 million, against the total Official Development Assistance (ODA) of \$1.3 trillion during the same period. The result is a mere 0.00239%, an insignificant fraction of the total ODA. In other words, less than 0.002% of the disbursed ODA was allocated to IP&LC-led research and research institutions. This alarmingly low percentage indicates a lack of recognition among major funders for the importance of funding this type of research.

Similarly, the Consortium of International Agricultural Research Centers (CGIAR) began recording data on its funding portfolio in 2011, totaling \$735 million. This amount grew to \$1 billion in 2013 and 2014. However, by 2022, CGIAR's annual research funding had fallen to \$771 million. Notably, the total funding for IP&LC-led research within the period of 1999–2022 is merely 4.06% of CGIAR's 2022 research funding portfolio. This further underscores the insignificant attention given to IP&LC-led research among donors despite the call for a localization agenda. The \$2.39 million identified in 2022 through this analysis for IP&LC-led research funding is much lower than the \$29.6 million disbursed for all research related to Indigenous Peoples and Local Communities, as discovered through the RRI/RFN Funding Dashboard (RRI/RFN, 2024). This indicates that funding for research led by IP&LC constitutes only 8% of the total funding for all IP&LC-related research using the RRI/RFN database (RRI/RFN, 2024).

4.2.2 Limits of Findings

Keywords relating to IP&LC-led research funding were tested only twice with the LLM, which produced different results containing the maximum amounts possible for the target search. Combining multiple keywords may generate different results and further decrease the amount identified.

Bidirectional Encoder Representations from the Transformers (BERT) model and GPT model were tested in this analysis, with only the BERT model's results giving the most trusted results for

this research. Other models may prove very helpful for comparing models and determining result accuracy.

There was no ground-truthing with actual IP&LC research organizations to see if the results seemed consistent with their real income for IP&LC-led research.

5.0 Conclusion and Recommendations

5.1 Conclusions

The vital role that IP&LCs play in maintaining biodiversity, preserving traditional knowledge, and advancing global sustainability objectives, as well as research efforts by their indigenous institutions, have not received adequate financial backing. This challenge hampers IP&LCs' ability to advocate for more significant support. This funding challenge has the potential to hinder their efforts to continue their vital work and impact their ability to transfer their knowledge to future generations, which may have far-reaching consequences for the environment and humanity. There is growing empirical evidence that Indigenous Peoples and Local Communities possess strong knowledge and have significantly used their traditional wisdom to counteract the effects of climate change and mitigate disasters through several approaches to biodiversity preservation. IP&LC institutions are leading the frontiers of indigenous-led research because they embody the knowledge and practical ways of solving local problems by understanding the IP&LCs' remote challenges. Despite billions of dollars in ODA to developing countries annually, their work is impeded due to the very small amount of donor funding available to IP&LC-led research and research institutions. The analysis from this research (from 1999- 2022) suggests that at most 0.002% of the overseas development assistance allocation of 1.31 trillion dollars went to support the IP&LC-led research and research institutions in LMICs, and it also represents a tiny fraction of the total global allocation for research.

5.2 Recommendations

IP&LCs and their research institutions have faced exclusion and undervaluation of their perspectives and knowledge. Therefore, funding indigenous-led research initiatives can help provide the necessary resources and support, while IP&LC organizations need to make publicly

available the details of all the financial support they receive, along with the purpose for which funding was given. To this end, the following recommendations are put forward:

- Multilateral organizations such as the World Bank, United Nations, World Trade Organization, etc. and bilateral organizations such as USAID and their equivalents in wealthy countries providing ODAs, need to recognize the efforts of IP&LCs and IP&LC research institutions and provide funding support for their work.
- There is a dearth of structured and organized reporting for IP&LC-led research funding, which makes it difficult to track. Therefore, established databases, particularly the OECD, should add new reporting categories, including IP&LC, IP&LC research, and IP&LC-led research.
- Funding accessibility and flexibility must be improved to ease applying for funds and meet the eligibility criteria for IP&LC organizations and researchers. Introducing more flexible funding models can accommodate the unique requirements and priorities of IP&LC-led research institutions.

These recommendations, when applied comprehensively, have the ability to substantially enhance the funding for research by Indigenous Peoples and Local Communities (IP&LCs) and grant these communities the power to steer their own research agendas and knowledge production. Persistent advocacy and cooperation between IP&LC groups, funding bodies, and research establishments will be crucial to achieving this goal.

5.2.1 Recommendations for Further Research

Subsequent research can include a survey of IP&LC research organizations, generating a "bottom-up" estimate to ground-truth the LLM's findings.

Further efforts can ask RRI and RFN to include the keyword "IP&LC-led research" in the next run of their model and include it in their dashboard.

Further efforts with access to funding, time, and manpower can build an online dashboard that will be an accessible resource to everyone who needs it for their research and advocacy.

Bibliography

1. Adomako, M., & Cohen, M. J. (2022). Funding the localization agenda: Measuring progress of United States development and humanitarian assistance to local organizations. Oxfam America. Retrieved from https://webassets.oxfamamerica.org/media/documents/Funding_The_Localization_Age_NDA_FINAL.pdf
2. Agrawal, A., Khare, A., Nguiffo, S., Ole Riamit, K., Setra, M. S., Sherpa, P. D., White, A., & Whyte, K. (2023). Partnership for Transformation: Concept Note.
3. Arjjumend H. (2018). Recognition of Customary Law and Institutions and Community Protocols of Indigenous People in Domestic ABS Legislation or Policies in Accordance with the Provisions of the Nagoya Protocol. Journal of Vasyl Stefanyk Precarpathian National University
4. Birdsall, N., Moore, G., & Webster, B. (2023). Opinion: Here is a starting point to decolonize development research. Devex. Retrieved from <https://www.devex.com/news/opinion-here-s-a-starting-point-to-decolonize-development-research-105117>
5. Borrini-Feyerabend, G., Dudley, N., Jaeger, T., Lassen, B., Pathak Broome, N., Phillips, A. and T. Sandwith. (2013). Governance of protected areas: From understanding to action. Best Practice Protected Area Guidelines Series No. 20, Gland, Switzerland: IUCN.
6. Bridgewater, P., Régnier, M., & García, R. C. (2015). Implementing SDG 15: Can large-scale public programs help deliver biodiversity conservation, restoration, and management while assisting human development? *Natural Resources Forum*, 39, 214–223. <https://doi.org/10.1111/1477-8947.12084>
7. Cajete, G. A. (2020). Indigenous science, climate change, and Indigenous community building: A framework of foundational perspectives for Indigenous community resilience and revitalization. *Sustainability*, 12(22), 9569. <https://doi.org/10.3390/su12229569>
8. CGIAR. (2022). Consortium of international agricultural research centers: From spurring the green revolution to spearheading food systems science. Retrieved from <https://www.cgiar.org/food-security-impact/one-cgiar/>
9. CGIAR. (2022). CGIAR system annual performance report 2019: Summarized Report. Retrieved from <https://cgspace.cgiar.org/items/8e53e225-ada7-4436-abf8-c1a49d0537c3>
10. Commission for Research Partnerships with Developing Countries, KFPE. (2001). Enhancing research capacity in developing and transition countries. Retrieved from https://kfpe.scnat.ch/en/about_kfpe
11. Council on Foundations. (2022). The State of Global Giving by U.S. Foundations, 2022 edition. Retrieved from <https://cof.org/sites/default/files/documents/files/private/2022-state-global-giving-US-foundations.pdf>
12. Datta, R. (2018). Decolonizing both researcher and research and its effectiveness in Indigenous research. *Research Ethics*, 14(2), 1-24. <https://doi.org/10.1177/1747016117733296>

13. Dawson, N. M., Coolsaet, B., Sterling, E. J., Loveridge, R., Gross-Camp, N. D., Wongbusarakum, S., Sangha, K. K., Scherl, L. M., Phan, H. P., Zafra-Calvo, N., Lavey, W. G., Byakagaba, P., Idrobo, C. J., Chenet, A., Bennett, N. J., Mansourian, S., & Rosado-May, F. J. (2021). The role of Indigenous Peoples and Local Communities in effective and equitable conservation. *Ecology and Society*, 26(3), Article 19. <https://doi.org/10.5751/ES-12625-260319>
14. Devex. (2022). Amid localization, INGOs aren't going away, says Interaction chief. Retrieved from <https://www.devex.com/news/amid-localization-ingos-aren-t-going-away-says-interaction-chief-102475>
15. Devex. (2022). International Foundation for Science (IFS). Retrieved from <https://www.devex.com/organizations/international-foundation-for-science-ifs-99796>
16. Devex. (2022). Localization agenda, the editor's note. Retrieved from <https://devex.shorthandstories.com/the-localization-agenda/index.html#group-section-The-need-for-localization-A9MwYxRdJm>
17. Devex. (2024). Interactive: Which Sectors received the most aid in 2022? Retrieved from <https://www.devex.com/news/interactive-which-sectors-received-the-most-aid-in-2022-106956>
18. Ford Foundation (2022). Keeping Our Commitment: Update on Our Pledge for Tenure Rights and Forest Guardianship of Indigenous Peoples. Retrieved from <https://www.fordfoundation.org/news-and-stories/stories/keeping-our-commitment-update-on-our-pledge-for-tenure-rights-and-forest-guardianship-of-indigenous-peoples/>
19. Forest Tenure Funders Group. (2022). Indigenous Peoples and Local Communities Forest Tenure Pledge Annual Report 2021-2022.
20. Global Environment Facility (2022). Inclusive Conservation Initiative prioritizes Indigenous and local community-led solutions. <https://www.thegef.org/newsroom/press-releases/inclusive-conservation-initiative-prioritizes-indigenous-and-local>
21. Global Humanitarian Assistance Report. (2021). Development initiative. Retrieved from <https://devinit-prod-static.ams3.cdn.digitaloceanspaces.com/media/documents/Global-Humanitarian-Assistance-Report-2021.pdf>
22. Hufty, M. (2020). Indigenous peoples and local communities. In (Eds.) M. Hufty, (Eds.) M. Hufty (Eds.) M. Hufty (Eds.), [Title of the Book or Journal Article] (pp. 53-xx). Publisher. DOI/URL
23. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2020). Indigenous Peoples and Local Communities. Retrieved from <https://www.ipbes.net/glossary-tag/indigenous-peoples-and-local-communities>
24. Jeff Desjardins (2018). Visualizing How Much Countries Spend on R&D. Retrieved from <https://www.visualcapitalist.com/money-country-puts-r-d/>
25. Jones, N., Bailey, M., & Lyytikäinen, M. (2007). Research capacity strengthening in Africa: Trends, gaps and opportunities. Overseas Development Institute. Retrieved from <https://www.odi.org/>

26. Lancaster, Carol. (2007). *Foreign Aid: Diplomacy, Development, Domestic Politics*. Bibliovault OAI Repository, the University of Chicago Press. 5. 10.1017/S1537592707072738.
27. Lee, S. T. T. (2022). The Indigenous-led report warns against ‘simplistic take on conservation. Mongabay. Retrieved from <https://news.mongabay.com/2022/03/indigenous-led-report-warns-against-simplistic-take-on-conservation/>
28. Lele, U., & Goswami, S. (2021). CGIAR. In *Food for All: International Organizations and the Transformation of Agriculture*. Oxford. Retrieved from <https://doi.org/10.1093/oso/9780198755173.003.0011>
29. McArthur, J. W., & Werker, E. (2016). Developing countries and international organizations: Introduction to the special issue. *The Review of International Organizations*, 11, 155–169. <https://doi.org/10.1007/s11558-016-9251-2>
30. Mishra, M., Sudarsan, D., Santos, C., Mishra, S., Kar, D., Baral, K., & Pattnaik, N. (2021). An overview of research on natural resources and indigenous communities: A bibliometric analysis based on Scopus database (1979–2020). *Environmental Monitoring and Assessment*, 193. <https://doi.org/10.1007/s10661-020-08793-2>
31. Morgera, E & Tsioumani E. (2012). Indigenous Peoples, *Yearbook of International Environmental Law*, Volume 23, Issue 1, 2012, Pages 224–233, <https://doi.org/10.1093/yiel/yvt006>
32. Nakashima, D. J., Galloway McLean, K., Thulstrup, H. D., Ramos Castillo, A., & Rubis, J. T. (2021). Weathering uncertainty: Traditional knowledge for climate change assessment and adaptation. UNESCO and UNU.
33. National Science Board, National Science Foundation. (2022). Research and Development: U.S. Trends and International Comparisons. *Science and Engineering Indicators 2022*. NSB-2022-5. Alexandria, VA. Available at <https://ncses.nsf.gov/pubs/nsb20225/>.
34. OECD. (2023). Climate finance provided and mobilised by developed countries in 2013-2021: Aggregate trends and opportunities for scaling up adaptation and mobilised private finance. OECD Publishing. <https://doi.org/10.1787/e20d2bc7-en>
35. OHCHR (2001). The mechanism of a Special Rapporteur on the Human Rights and Fundamental Freedoms of Indigenous People is established by the Commission on Human Rights (<http://www.ohchr.org/english/issues/indigenous/rapporteur/>)
36. Power, S. (2021). Localization at USAID: The Vision and Approach. A renewed commitment to localization in pursuit of locally-led action for sustainable solutions. Retrieved from https://www.usaid.gov/sites/default/files/2022-12/USAIDs_Localization_Vision-508.pdf
37. Power, S. (2021). USAID chief Samantha Power details localization push. Retrieved from <https://www.devex.com/news/usaid-chief-samantha-power-details-localization-push-102256>

38. Rights and Resources Initiative. (2017). Securing community land rights: Priorities and opportunities to advance climate and sustainable development goals. <https://rightsandresources.org/wp-content/uploads/2017/09/Stockholm-Priorities-and-Opportunities-Brief.pdf>
39. Rights and Resources Initiative (2020) Rights-Based Conservation: The Path to Preserving Earth's Biological and Cultural Diversity? Technical Report, p. 25
40. Rights and Resources Initiative, 2022. Reconciling Conservation and Global Biodiversity Goals with Community Land Rights in Asia,
41. Right and Resources Initiative, Rainforest Foundation Norway, (2022). *Making funding for Indigenous Peoples and Local Communities fit for purpose.* www.regnskog.no/en/news/less-than-a-fifth-of-IP&LC-intended-funding-reach-communities
42. Rights and Resources Initiative (2023). *Who Owns the World's Land? Global State of Indigenous, Afro-Descendant, and Local Community Land Rights Recognition from 2015–2020 (Second Edition).*
43. Rights and Resources Initiative and Rainforest Foundation Norway (2024). State of Funding for Tenure Rights and Forest Guardianship Donor Funding for Indigenous Peoples, Local Communities, and Afro-descendant Peoples in Tropical Forested Countries (2011–2023).
44. Rights and Resources Initiative and Rainforest Foundation Norway (2024). Path to Scale Funding Dashboard. <https://dashboard.pathtoscale.org/>
45. Sobrevila, C. (2008). The role of Indigenous Peoples in biodiversity conservation: The natural but often forgotten partners. World Bank.
46. The Economist. (2021). The case for more state spending on R&D. Retrieved from <https://www.economist.com/briefing/2021/01/16/the-case-for-more-state-spending-on-r-and-d>
47. The Economist. (2023). New ways to pay for research could boost scientific progress. Retrieved from <https://www.economist.com/science-and-technology/2023/11/15/new-ways-to-pay-for-research-could-boost-scientific-progress>
48. UNDESA. (2009). State of the World Indigenous Peoples. United Nations Department of Economic and Social Affairs, Division for Social Policy and Development Secretariat of the Permanent Forum on Indigenous Issues.
49. United Nations (2020). International Day of the World's Indigenous Peoples 9 August. We Need Indigenous Communities for a Better World. <https://un.org/en/observances/indigenous-day/background>
50. UNDESA. (2022). Indigenous Peoples at the United Nations. United Nations Department of Economic and Social Affairs. Retrieved from <https://www.un.org/development/desa/indigenouspeoples/about-us.html>

51. UNPFII. (2021) States of the World Indigenous Peoples *By the Secretariat of the United Nations Permanent Forum on Indigenous Issues*. https://www.un.org/esa/socdev/unpfii/documents/SOWIP/en/SOWIP_introduction.pdf
52. USAID. (2023). Moving toward a model of locally-led development: FY 2022 localization progress report. Retrieved from [https://www.usaid.gov/sites/default/files/2023-06/FY%202022%20Localization%20Program%20 Report-June-12-23_vFINAL_1.pdf](https://www.usaid.gov/sites/default/files/2023-06/FY%202022%20Localization%20Program%20Report-June-12-23_vFINAL_1.pdf)
53. USAID. (2023). Partners in Localization: Designing for Change workshop summary report. Retrieved from https://storage.googleapis.com/strapi-media-dev/Summary_Report_USAID_Partners_in_Localization_59b3ed48e3/Summary_Report_USAID_Partners_in_Localization_59b3ed48e3.pdf
54. World Bank. (2019). Indigenous Peoples. Retrieved from <https://www.worldbank.org/en/topic/indigenouspeoples>
55. Youdelis, M. Townsend, J. Bhattacharyya, J. Moola, F. & Fobister, J., (2021). “Decolonial conservation: establishing Indigenous Protected Areas for future generations in the face of extractive capitalism”, *Journal of Political Ecology* 28(1), 990–1022. doi: <https://doi.org/10.2458/jpe.4716>