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Identifying models for benefit sharing in different domains – An exploration of benefit sharing across industries

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Contents

Glossary

ABS	access and benefit sharing
ARA	AIDS Research Alliance
ATK	Associated Traditional Knowledge
CARE	'Collective Benefit, Authority to Control, Responsibility, and Ethics'
CBD	Convention on Biological Diversity
CCSI	Community Development Agreement Database
CIMRAD	Cook Islands Medical Research and Development
COP	Conference of the Parties
CSIR	Council for Scientific and Industrial Research
DSI	Digital Sequence Information
EBRD	European Bank for Reconstruction and Development
FAIR	'Findable, Accessible, Interoperable and Reusable'
FPIK	Free, prior informed consent
GRATK	Genetic Resources and Associated Traditional Knowledge
HIV	Human Immunodeficiency Virus
IP	Intellectual Property
ICBG	International Cooperative Biodiversity Group (ICBG)
IPLC	Indigenous Peoples Local Communities
Iwi	the largest social unit of Māori society, roughly means people/nation
Kaitiaki	steward/guardian
Kaitiakitanga	custodianship/stewardship/guardianship
mana	dignity, power, authority
Mana whenua	authority over/of the land, people of the land
manaakitanga	generosity, support
mātauranga Māori	Māori knowledge
OECD	Organisation for Economic Co-operation and Development

PSCN	Pacific Scientist and Community Network
PNG	Papua New Guinea
Pūkenga	specialist, expert
Rangatiratanga	chieftainship with chiefly autonomy, inherited from the ancestors
R&D	research and development
rongoā	medicinal
SIMDP	Sakhalin Indigenous Minorities Development Plan
SASC	South African San Council
STEM	science, technology, engineering, and mathematics
SING	Summer Internship for Indigenous Genetics
Taonga	something sacred, treasured, special
TK	traditional knowledge
Tohunga	skilled person, chosen expert, priest, healer
THS	Tongan Health Society
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNSW	University of New South Wales
UPNG	University of Papua New Guinea
Whakaute	respect, care for
WIPO	World Intellectual Property Organization
WCC	Wiradjuri Condobolin Corporation

What is benefit sharing?

Indigenous peoples, as resource owners (in a Māori context, mana whenua), resource stewards (kaitiaki) or knowledge holders (tohunga/pukenga), do not experience commensurate economic and wider social benefits from the use of resources from land or knowledge that is traditionally occupied, generated or owned by them.

Across numerous OECD indicators, there exist large gaps between Indigenous and non-Indigenous populations (OECD, 2019a). Average household incomes across indigenous peoples are 30% lower than comparable non-indigenous populations. The OECD states that labour market inequalities are also high between Indigenous and non-Indigenous populations with rates of secondary school completion standing 20% lower and employment participation 13% lower for the Indigenous population (Raderschall et al., 2020). Such gaps tend to be larger in rural areas due to larger indigenous population proportions and despite the fact that resource extraction is often happening in rural areas. For Māori specifically, most Māori land holdings are in rural areas, and rural Māori have greater unemployment and worse health and mortality outcomes (Crengle et al., 2022). It is worth noting that for Māori, increased cultural efficacy is linked to an increased positive expectation of financial success demonstrating resilience of collectivist cultural values among Māori (Houkamau & Sibley, 2017).

It is important to note the differences between Indigenous knowledge (mātauranga) as Intellectual Property (IP), and Western approaches to IP. In a Māori specific context, mātauranga is cherished and falls under the practice of kaitiakitanga, or guardianship. That is to say, mātauranga is treated as a taonga (sacred treasure) and is to be looked after and cherished in order for future use by further generations. 'Ownership' of mātauranga in the western sense does not exist, but instead individuals or communities who hold the knowledge (or resource) ensure that it is looked after and available for future generations.

Conversely, 'Western' approaches to IP are focused on enabling protected use for a certain period of time so an individual or business can maximise the value of that IP. For example, the New Zealand Intellectual Property Office states that;

"*a patent provides the exclusive right to commercially exploit an invention (or novel IP) for up to 20 years. During this time, you may be able to use your patent to raise money for your business, license or sell your patent, and take legal action to exclude others from using the invention covered by your patent*." (New Zealand Intellectual Property Office, 2024)

Trademarks and copyrights have similar functions, affording a timeframe of ownership for value extraction. There are numerous examples of Indigenous knowledge and resources being used without consent or benefit sharing, contributing to the poor economic status of Indigenous peoples. The ongoing effects of colonisation contribute to the financial inequalities that Indigenous communities experience, and the ongoing appropriation of

Indigenous knowledge and resources, illustrates the need for equitable benefit sharing approaches. Benefit sharing in this sense allows indigenous communities to derive better economic and social outcomes from the use of their knowledge and resources.

Benefit sharing, if well-designed, can support Indigenous well-being and rangatiratanga (self-determination), setting Indigenous communities on a path towards sustainable development and reducing inequalities. The extent to which benefit sharing agreements and funds deliver robust results for Indigenous peoples differs considerably and is dependent on the nature of the benefits, ownership structures, and benefits are distributed.

For Indigenous communities - benefit sharing agreements can establish a clear process for ongoing engagement between the community and development proponents creating transparency around issues of Free, Prior, Informed Consent (FPIC), community rights and interests, access and use of traditional knowledge (TK), and any environmental and cultural protections. Benefit sharing agreements emerge from a process of negotiation and power differences impact on the quality of the outcome - Indigenous communities may feel pressured to sign agreements because they have no actual control or veto over developments on their traditional territories and/or the benefits that they receive may not fully compensate for the negative impacts of resource developments.

For businesses or other organisations looking to engage with indigenous groups, benefit sharing agreements establish a *social license to operate* (Data Futures Partnership, 2017)*, and/or cultural license to operate* (Data Futures Partnership, 2021). They outline clear processes of engagement, reduce project risk through economic certainty, establish predictable timelines, enhance reputation and social responsibility.

Different approaches to benefit sharing

The OECD breaks down benefit sharing into two specific types –

> *Agreements* - privately negotiated and legally enforceable agreements that establish formal relationships between Indigenous communities and industry proponents;
> *Funds* - are financial structures wherein revenues collected by governments from specific activities (e.g., taxes, royalties, penalties, permits and other fees) and/or royalties and payments from companies are shared with Indigenous peoples and/or communities.

Participation in a benefit sharing agreement does not negate participation in benefit sharing funds and some benefit sharing agreements include contributions to funds.

Table 1: Summary of benefit sharing models

A. Government-Controlled Benefit Sharing	
Resource sharing revenues/benefit funds	Sharing of industry revenues collected by governments with Indigenous peoples and/or communities. This includes but is not limited to taxes, royalties, penalties, permit and other fees.
Local content obligations	Targets for the hiring of local workers and procurement of local goods and services may be included in host government agreements with companies, and in some cases is legislated. Government-mandated local content is frequently interpreted as 'national' content, rather than targeting local and Indigenous communities.
Mandatory social investment	Social investment spending can be mandatory as part of a host government agreement or national legislation, whereby companies are required to invest in infrastructure programmes, such as road construction or health facilities, as a condition of their licence.
B. Voluntary Company-Led Initiatives	
Voluntary engagement	Companies may voluntarily engage in community engagement and/or investment in addition to their mandatory obligations under law. For example, the International Council on Mining and Metals (ICMM) 'Community Development Toolkit' and 'Good Practice Guide: Indigenous Peoples and Mining".
Strategic social investment	Social investment spending on programmes are designed to survive beyond the life of the industrial project and/or to create value for the industrial project. These might include micro-credit programmes, local livelihoods support programmes, skills training, enterprise development support, or conservation programmes.
C. Partnership Model	
Voluntary local content initiatives	Companies may develop partnership programmes based on voluntary targets and initiatives to train and bring in the local and Indigenous workforce to a project, with training and enterprise support linked to opportunities to secure employment or contracts, often with an element of preferential contracting. This may or may not form part of a wide benefit sharing agreement.
Benefit sharing agreements	Benefit sharing agreements are negotiated directly with communities and may include payments, profit sharing, local hiring, skills development, education, cultural support and environmental protection. These are likely to be closely related to impact assessments, and may also provide the basis for a process that reflects principles aligned with the concept of free, prior and informed consent (FPIC). Benefit sharing agreements may include benefit funds: the payment and management of royalties from development activities to affected Indigenous communities and peoples.
D. Indigenous Ownership and Control	
Indigenous ownership	Indigenous peoples' ownership of companies or equity shares in enterprises involved in extracting or processing resources or enterprises providing services to the industry. Opportunities can be enhanced through government support and preferential contracting.
Indigenous control	Indigenous control relates to Indigenous peoples' right to determine their own development priorities and strategies, and includes participation in strategic-level decision-making on resource-related policies, programmes and regulations, including resource mapping, zoning and land allocation and environmental processes (such as remediation),, and free prior and informed consent.

(Source: Raderschall et al., 2020)

The OECD provides a summary of benefit sharing models broken down into Government controlled, voluntary company-led, partnerships and indigenous ownership and control (Raderschall et al., 2020). This table is adapted from a paper on benefit sharing in Arctic resource projects by Wilson (2019). This summary illustrates a spectrum of Indigenous participation from no direct participation to partnership models or Indigenous ownership.

Overview of benefit sharing models – what works and what doesn't?

There is an increasing amount of literature on benefit sharing models and continuing debates regarding their overall effectiveness. The OECD cites several Australian examples (J. Altman, 2009; J. C. Altman, 2004) as well as other examples (Cameron & Levitan, 2014; Peterson St-Laurent & Billon, 2015). The chief concerns highlighted in the referenced literature are outlined below.

Power asymmetries

Power asymmetries result from a lack of access to information such as technical information, regulatory requirements and adherence to due process; a lack of resources to meaningfully engage with development proponents and in some cases, a lack of documentation to demonstrate anticipated community impacts and concerns (Raderschall et al., 2020). Indigenous communities are not always recognised as having inherent rights but often suffer from being considered as just another stakeholder group. To address this challenge governments, Indigenous organisations and industry have developed best practice toolkits and other guidance to support engagement. One promising initiative is being developed by the Centre of Excellence for Indigenous Mineral Development in Canada as a centre of expertise for data sharing, regulatory guidance and best practices in partnership with a University, an Indigenous business development corporation, and the Canadian government.

Improving transparency

Another issue is the lack of openness and transparency around benefit sharing agreements. Confidentiality clauses in benefit sharing agreements reduce the bargaining power of Indigenous groups, create divisions amongst Indigenous groups, prevent Indigenous groups from seeking assistance from third parties (OECD, 2020). The OECD has recommended that governments should support the development of accessible databases that systematically record and publish benefit sharing agreements (excluding commercial confidential information), as access to comparable benefit agreements assists informed negotiation (OECD, 2019a).

Long term impacts on communities

Few repositories hold information on benefit sharing agreements limiting both knowledge about the agreements and ability to assess long term impacts from the agreements. The Columbia Centre for Sustainable Investment holds the Community Development Agreement database (CCSI)[1] and the Simon Fraser University had the Impact Benefit Agreement database (Columbia Centre for Sustainable Investment, 2020; Simon Fraser University, 2012) and the University of Melbourne provides a website that lists over 1000 agreements – the "Agreements, Treaties and Negotiated Settlements project" – primarily from Australia, Canada, New Zealand and South Africa (ATNS, n.d.).

Level of Indigenous participation

The level of participation in resource projects and benefit sharing is often related to the level of Indigenous ownership and control over resources (e.g. recognition of land, water and

[1] Based at Columbia University, New York City

other resource rights). Indigenous rights regimes differ across OECD countries, and a summary table is provided below. In many places, Indigenous land rights remain contested and are a matter of evolving jurisprudence. For example, in the case of Sweden, Finland and Norway, Sami rights to land are interpreted as rights to use and industries have adopted compensatory models (as opposed to benefit sharing agreements). This approach is widely contested by Sami peoples (Koivurova et al., 2015; Larsen et al., 2018; OECD, 2019b).

Table 2: Indigenous property rights: United States, Canada, New Zealand, Australia, and Sweden

Country	Statutory Indigenous property rights
United States	▪ **Owner** of lands and sub-surface resources in Alaska (Regional Corporations) ▪ **Individual owner** of fee simple title (allotted lands) ▪ **Collective proprietor** of reserve land and restricted fee title
Canada	▪ **Collective owner** of land through comprehensive agreements ▪ **Collective owner** of land acquired in the market ▪ **Collective proprietor** of reserve land ▪ **Individual possessor** of reserve land allotted by collective
New Zealand	▪ **Individual owner** of Māori land, often in co-ownership.
Australia	▪ **Collective owner** of land through state land rights acts of Northern Territory, South Australia and New South Wales ▪ **Collective proprietor** of exclusive Native Title determinations (national) ▪ **Collective possessor** of non-exclusive Native Title determinations (national) ▪ **Collective possessor** of reservations in Western Australia
Sweden	▪ **Collective authorised user** of land, but only for *Sameby* members and with the purpose of reindeer herding.

Source: (OECD, 2019[4])

National and International instruments for Indigenous rights and benefit sharing

International agreements such as the United Nations Declarations of the Rights of Indigenous Peoples (UNDRIP) (United Nations, 2008), Nagoya Protocol (United Nations, 2011), the corresponding Convention on Biological Diversity (CBD) (United Nations, 2011) and the World Intellectual Property Organization (WIPO) Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge (GRATK) (World Intellectual Property Organization, 2024b) exist that protect the IP rights of Indigenous peoples as well as national instruments but adherence to such agreements and benefit sharing is ad hoc, and where there is legislation governing benefit sharing requirements, enforcement can be difficult. Recent developments include:

CBD: COP15 Decision 15/9 established a multilateral mechanism to share benefits derived from digital sequence information (DSI). While the decision notes that tracking and tracing of all DSI is not feasible, it does acknowledge the importance of Indigenous Peoples Local Communities (IPLC) considerations within DSI and addresses the FAIR (Findable, Accessible, Interoperability, and Reproducibility) & CARE Principles (Collective Benefit, Authority to Control, Responsibility, and Ethics) in the sharing of DSI. Conference of the Parties (COP)16 will continue discussions about the nature of the multilateral mechanism, including the usefulness of geographical information and IPLC provenance information. Discussions within the CBD have identified one international mechanism - the Local Contexts traditional knowledge and biocultural Labels and Notices - as a key tool for IPLC provenance metadata.

WIPO: In May 2024, a World Intellectual Property Organization (WIPO) Diplomatic Conference ratified the new WIPO Treaty on Intellectual Property, Genetic Resources, and Associated Traditional Knowledge (ATK). This Treaty confirms the need for a disclosure requirement of country of origin for the use of GR, and where there is ATK, disclosure of the relevant IPLC who provided the TK is also necessary. While DSI has not been specifically mentioned in the WIPO Treaty due to the difference of opinion between the Parties, the need for greater transparency and disclosure of Indigenous interests in research and research outcomes is clearly a cross-forum issue.

Case studies

This paper draws on the experiences of Indigenous Peoples from around the globe highlighting examples from a range of industries including genomic research, biotechnology, fashion, entertainment and mining. These examples demonstrate a range of approaches along the OECD spectrum of indigenous, private and government involvement.

Genomic research and biotechnology case studies

Brazilian government legislation on access to biodiversity

In 2015 the Brazilian Federal Government introduced legislation to address the protection of its biodiversity and genetic resources. Brazil is home to over 20% of the world's biodiversity and is one of the most biodiverse countries on the planet. The law addresses the protection of genetic heritage in Brazil, which includes ATK, encompassing all "information or practice of indigenous population, traditional community, or traditional farmers on the properties or direct or indirect uses associated with genetic heritage" (Silva & Oliveira, 2018). ATK is characterized in two ways: of identifiable origin – in which it is possible to link its origin to at least one indigenous population, traditional community, or traditional farmer; and of unidentifiable origin - when this linkage is not possible. In the case of ATK with identifiable origin, no research can be initiated before obtaining FPIC (Silva & Oliveira, 2018).

The National Fund for Benefit Sharing (FNRB) was established to receive the money from benefit sharing and fines and aims to support actions and activities that acknowledge the value of genetic heritage and associated TK, and promote its use in a sustainable way (Folgosi et al., 2021). When benefit sharing comes from genetic heritage or ATK with unidentifiable origin, the Federal Government is indicated as the recipient of the benefit sharing to be deposited in the FNRB, which is set at 1% of annual net revenue obtained from the use of the TK resource. When the economic exploitation comes from ATK of identifiable

origin, the deposit in the FNRB will be 0.5% of the annual net revenue, in addition to the amount negotiated directly with the user (Folgosi et al., 2021).

In addition to the Monetary Benefit Sharing, the legislation also provides for non-monetary benefit sharing, which can be done by implementing projects for conservation or sustainable use of biodiversity or for protection and maintenance of associated TK technology transfer; distribution of the product in the public domain; training of human resources and free distribution of products in social interest programs (Folgosi et al., 2021).

Hoodia gordonii and the San People

The San people are one of the first peoples to settle Southern Africa[2], with stone tools and rock paintings estimating their settlement date to be at least 70,000 years ago (Vogt, 2012). The San were traditionally nomadic hunter-gatherers, however colonisation and apartheid regimes dispossessed the San of much of their traditional land, and the current population of roughly 60,000 live in small, poor settlements throughout Southern Africa (Bavikatte et al., 2010). Traditionally, San utilised their knowledge of the *Hoodia gordonii*, a succulent indigenous to Southern Africa, as an appetite suppressant during times of food or water scarcity (Bavikatte et al., 2010).

In 1996, the South African Council for Scientific and Industrial Research (CSIR) extracted and patented the bioactive compound in *Hoodia* responsible for suppressant effects. Throughout the next five years, various licensing development agreements were entered into between CSIR and other large pharmaceutical companies in an effort to transform this bioactive into a drug targeting appetite suppression, with the anti-obesity market being worth roughly $3 billion in the US in the early 2000s (Bavikatte et al., 2010). Until 2001, the San had no knowledge that such agreements utilising their TK were being entered into. An interview with the director of the United Kingdom based Phytopharm, one of the companies researching the bioactive, revealed that he believed the San were “extinct”. It wasn’t until intensive media interest and the following public outcry that the CSIR was forced to enter into benefit sharing negotiations with the San, negotiations that were completed in 2003, with the San receiving a percentage of royalties from any future drug sales (Bavikatte et al., 2010). Following intense public outcry, an MOU was signed between the CSIR and the South African San Council (SASC) in 2003, in which the San people were recognised as the TK holders. This was later built upon by the development of the benefit-sharing agreement, in which the SASC would receive 8% of all milestone payments from Phytopharm when certain performance targets had been reached, as well as 6% of all royalties made by the CSIR once the drug was commercially available. The only non-monetary benefits mentioned were a commitment to conservation of biodiversity and to undertake best practice procedures when collecting plant materials. Any IP generated through the research done by CSIR has

[2] Including; Botswana, Namibia, Angola, Zambia, Zimbabwe, Lesotho and South Africa

been vested exclusively with CSIR, despite criticism about this being in breach of two international conventions; the Convention on Biological Diversity, and the Bonn Guidelines. Robinson (2011) states that:

"Ultimately, this has turned from being a biopiracy case because of the lack of prior informed consent into an example of the many difficulties faced in establishing appropriate benefit-sharing arrangements."

Samoans and the mamala (*Homalanthus nutans*) tree

The people of Falealupo area on Savai'i island, Samoa, have used a tea made from the bark of the mamala tree as traditional medicine for hundreds of years, with many healers utilising it for the treatment of intestinal complaints and some knowing its capacity to treat severe viral infection, including hepatitis (D. Robinson, 2012). In the late 1980's Dr. Paul Cox was conducting ethnobotanical studies within the Falealupo rainforest. He had spent many years living in Samoa and learning the language, allowing him to engage with the local leaders and healers. This on-going relationship led him to the collection of many plants, one of which being the mamala tree. Cox explains how he obtained verbal consent prior to commencing his research:

"…I explained the purpose of my research and asked their permission to study with the village healers and to collect their medicinal plants for laboratory analysis. I also told them that there was a slight chance that a discovery could result in a commercial interest and pledged to do my best to ensure a return to the village from any discovery. The village chiefs unanimously agreed to grant me permission to conduct the research and to assist me in any way that they could" (Cox, 2001, p. 35).[3]

Screening of the plants by the US National Cancer Institute found that a molecule derived from the bark of the mamala, prostratin, had 'potent cytoprotective activity' – the capacity to protect healthy cells from a range of pathogens (Cox, 2001). More importantly, prostratin demonstrated potential as an antiretroviral pharmaceutical to treat Human Immunodeficiency Virus (HIV). There has been significant research recently into the laboratory synthesis of prostratin (Wender et al., 2008) and the AIDS Research Alliance (ARA) confirmed the molecule's dual effect at treating HIV infections.[4] The molecule is currently in phase I human clinical trials for HIV treatment.

Prior to this pharmaceutical development of prostratin, several benefit sharing agreements were entered into between the local people of Falealupo, the Samoan government and the

[3] It is worth noting that this interaction occurred prior to the introduction of the CBD, indicating that Dr. Cox's interactions were not driven by the requirements of any local or international agreements, but instead by a sense of respect for the local people, their mātauranga and culture.
[4] This dual effect is via reactivating HIV-1 in memory T cells that harbour latent proviruses, while down-regulating a specific immune system receptor that is targeted by HIV, preventing new HIV infections

scientists and academic institutions interested in the development of prostratin. These agreements provided myriad benefits to the Samoan government and the people of Falealupo. These include a significant portion of future net revenue derived from intellectual property licensed from research on the mamala, conservation of the rainforest area in Falealupo, community benefits such as schools and health care clinics and social recognition of the healers who provided mātauranga.

Papua New Guinea – Wanang nature plot

The biodiscovery project described in Papua New Guinea (PNG) involves scientific research to explore the biological, chemical, and medicinal properties of its biodiversity. The focus is on discovering new medicines, particularly for HIV and tuberculosis, using terrestrial endophytic microbes and marine invertebrates. The project also aims to document and preserve traditional medicinal plant knowledge in PNG. Additionally, it includes research on conservation and biodiversity in a forest dynamics plot in Wanang, PNG, covering forest analysis, carbon sequestration, climate effects, botanical surveys and ecosystem studies. The Wanang Conservation Area is an alliance of ten Indigenous clans that dwell in the rainforest and collectively protect 10,000 hectares of forest.

Benefit sharing

Here is a summary provided by the Access and Benefit Sharing (ABS) Capacity Development Initiative by the University of New South Wales (UNSW) of the benefit sharing arrangement that was reached which also includes the University of Papua New Guinea (UPNG):

Table 3: Summary of Monetary and nonmonetary benefits for Papua New Guinea

Summary of monetary and non-monetary benefits
The following table summarises some of the monetary and non-monetary benefits derived from the ICBG collaboration so far.

Monetary	Non-monetary
Sustaining contributions to the UPNG herpetarium and National Forest Research Institute herbarium in Lae.	Education and training: 65 UPNG student projects, 39 of them resulting in completion of degrees or certificates (undergraduate, honours, masters).
Supported collection expeditions, travel costs and field supplies, infrastructure (air conditioning, computers etc).	Workshops and support towards development and implementation of research permits, PIC and benefit-sharing procedures in PNG.
In the past 8 years of activity approximately $350,000 USD has gone to herbaria activities, students and infrastructure (most to UPNG). Has provided equipment and supplies for the bioassay lab for Honours and Masters students at UPNG pursuing diverse topics.	Expanded opportunities for PNG researchers through access to grants, fieldwork, updated laboratories and equipment.
Considerable milestone payments have been made to UPNG under the MOU (>$100,000 USD) with the most substantial payments made in 2004	17 co-authored publications (UPNG-Utah/Minnesota), and three patents (1 current, 2 pending).
The Wanang nature plot activities provides opportunity for development of PNGs scientific capacity through postgraduate fellowships (funded by an external philanthropic donation of USD $250,000).	Biodiversity conservation related scientific knowledge as described below.

Research Outcomes

The research at the Wanang nature plot has resulted in significant scientific achievements, including the collection and identification of over 5,500 plants and at least 536 species. An online checklist of PNG woody plant genera has been produced, along with several international cooperative biodiversity group (ICBG)-funded student projects on plant identification and forest dynamics. One notable outcome was the discovery of HTI-286, a potential anticancer drug, from a sponge tripeptide collected in PNG. Another project led to the development of new antivenoms for the Papuan taipan snake, with superior stability and cost-effectiveness. Additionally, a traditional analgesic and anti-inflammatory preparation from Papua New Guinea was chemically validated, leading to its marketing and distribution to other countries. The funds from the conservation project have gone into running a elementary and primary school with over 300 students, and a large range of academic education has been gained by members of the community. This capacity building through education has been facilitated through a research station which serves as a capacity building hub and has been able to provide pathways for the clans to generate income and foster livelihoods.

Variant Bio

Variant Bio (Variant Bio, 2024a) is unique to the other case studies described, as this company specifically conducts human genetic research and in that sense is excluded from the provisions of the CBD and the Nagoya Protocol. It has made two key pledges in relation to benefit sharing and their drug development efforts: the Affordable Medicines Pledge and the Long-Term Benefit Sharing Pledge (Variant Bio, 2024b).[5]

Affordable Medicines Pledge

Variant Bio commits to ensuring that its medicines are affordable and accessible to patients. This includes pricing its drugs responsibly, considering the economic conditions of different countries, and working with governments, NGOs, and other partners to ensure affordability.

Long-Term Benefit Sharing Pledge

Variant Bio pledges to share the benefits of its drug discoveries with the communities and countries where the genetic resources used in its research were originally found. This includes sharing financial benefits, such as royalties, and non-financial benefits, such as capacity building and technology transfer, to support the sustainable development of these communities.

Variant Bio commits to donating 4% of its total net revenue at the end of each calendar year to selected organisations which support communities among their active partner populations (the group of individuals connected to a project). These organizations provide services in healthcare, environment, education and culture. A benefit sharing committee, including representatives from active partners and populations, chooses the organizations annually. This commitment continues until Variant Bio is acquired or completes an initial public offering (IPO).

Upon acquisition or IPO, Variant Bio has committed to the distribution of net proceeds equal to 4% of fully-diluted shares of its common stock to selected organizations or a non-profit foundation. This final distribution aims to provide ongoing benefits to active partners and their populations. Variant Bio pledged to administer these commitments in good faith, with any questions about interpretation or application resolved by its board of directors in consultation with the benefit sharing committee.

In addition to the long-term benefit sharing pledge, which is a commitment to share future revenues, Variant Bio also provide short term benefits to communities that they work with. The causes to which the short-term funds are applied is decided by the community themselves. Examples of how funds have been distributed include:

[5] All information taken from the Variant Bio website - https://www.variantbio.com/, and https://www.variantbio.com/affordable-medicines-pledge-and-long-term-benefit-sharing-pledge

New Zealand – University of Otago

Variant Bio supported the first Indigenous Genomics Conference hosted at the University of Waikato in 2020, as well as "two community initiatives hosted by the Pacific Scientist and Community Network (PSCN) and the Tongan Health Society (THS), the inaugural Pacific Peoples Fono and the first strategic planning session for a Pacific Summer Internship for Indigenous Genetics (SING); and a STEM scholarship program and community projects through Pacific Trust Otago."

Madagascar - University of Antananarivo

"Variant Bio gave funds to rebuild a water pump in Tsianaloka Village on the West Coast, to buy roofing materials for a new high school going up soon in Tsiandatsiana Village in the Southern Highlands, and to provide a new roof and cement for a school in Ampandrialaza Village in the Central Highlands of Madagascar."

South Africa - University of Witwatersrand in Johannesburg

Variant Bio contributed to the renovation of Limpopo's Ratanang School for Children with Multiple Disabilities, supporting families of children with cerebral palsy. Additionally, the company purchased medical and other supplies to enhance the Vakoma Home For Frail Older Persons in Soweto, which cares for elderly individuals left unattended when their families are at work. Furthermore, Variant Bio provided a ride-on mower for the Rhulani Mabasa Children's Foundation in Soweto, helping transform an abandoned field into an educational, daycare and sports centre.

South Africa - African Research on Kidney Disease Consortium

Variant Bio supported the purchase of 55 JoJos (water tanks) to improve access to clean water across 31 villages in Agincourt, South Africa. These tanks each hold up to 5,000 litres of water and were distributed in person to the different villages over the course of three weeks by public engagement officer Simon Khoza.

The Cook Islands - the Koutu Nui Agreement

The Cook Islands do not currently have a law governing access and benefit sharing, but the Traditional Knowledge Act 2013 governs how TK is to be protected. Key provisions of the Act include the establishment of a Traditional Knowledge Register to record TK, the recognition of the rights of TK holders, and the establishment of a Traditional Knowledge Council to advise on TK matters. The Act also provides for the protection of TK from unauthorized use or exploitation and sets out penalties for the misuse of TK. Overall, the Act aims to support the preservation and transmission of TK within the Cook Islands community (Cook Island

Government, 2013). There is currently also a research permit requirement in place for foreign scientific and research activity being conducted in the Cook Islands, including around the collection of biological samples (Robinson, 2012; Robinson & Romagiano, 2010). The National Environmental Service also has released a detailed policy on benefit sharing within the Cook Islands in 2018 (Cook Islands National Environment Service, 2018).

Dr. Graham Matheson, a medical researcher with dual citizenship in the Cook Islands, observed traditional plant-based treatments for bone fractures and other medical uses within his community while growing up in the Cook Islands. After training as a medical practitioner, he conducted research at UNSW on the pharmacological effects of these traditional methods using some funding from UNSW as well as his personal funds.

Dr. Matheson's research focused on bone and wound healing, leading to patents for treatments using extracts from *Vigna marina, Cocos nucifera,* and *Terminalia catappa* for wound healing and skin care, and *Hibiscus tiliaceus* for bone and cartilage treatment. In this case, TK and GR were not provided directly from Koutu Nui, but rather Dr. Matheson developed a formula based on information gathered from his community and samples from his home. The subsequently developed solution was then taken to Australia for testing (Robinson, 2012).

In 2003, he proposed investigating and commercialising medical remedies based on plant extracts and TK, leading to a benefit sharing agreement with the Koutu Nui (the lawfully recognised indigenous representative body) (Robinson, 2012). Dr. Matheson reached a benefit-sharing agreement with the Koutu Nui, leading to the incorporation of Cook Islands Medical Research and Development (CIMRAD) with equal shareholding between Matheson and the Koutu Nui (Robinson & Romagiano, 2010). CIMRAD was to commercialise the research and development (R&D) efforts, with the Koutu Nui responsible for allocating received funds for the benefit of Cook Islands' Indigenous Community. Additionally, CIMTECH, an Australian company, was established to access grants, for tax purposes, and to protect IP. CIMTECH incorporated the Koutu Nui and UNSW as shareholders, with ownership held by an Australian trust benefiting the Koutu Nui and Matheson family. The Koutu Nui understood that additional investment in CIMTECH would dilute their shareholding, and they agreed to these terms.

Below is a summary provided by the ABS Capacity Development Initiative by the UNSW of the benefit sharing arrangement that was reached (Robinson & Romagiano, 2010). Table 4 summarises some of the monetary an non-monetary benefits derived from the UNSW, Cook Island Koutu Nui Limited collaboration so far.

Table 4: Summary of Monetary and nonmonetary benefits for Cook Islands Koutu Nui

Summary of monetary and non-monetary benefits

Monetary (USD)	Non-monetary
Koutu Nui shareholding value estimated to be worth at least $150,000 (after personal investment by Matheson of $300,000).	Expected contributions to the local economy through the laboratory and processing facility in Raratonga, sales, marketing and tourism (use of product in spas and hotels).
Anticipated dividend payments to the Koutu Nui via the shareholding in CIMTECH.	Research directed towards priority health care needs – bone and wound healing.
Research income to CIMTECH: $264,000 in grants received from the Australian Government, and $74,000 from UNSW.	Physical technology transfer of machinery to the processing facility and laboratory.
Employment of 12 people on a part time basis in the Cook Islands (expected to expand upon launch of the cosmetic product)	Joint ownership of patents assigned to CIMTECH (of which the Koutu Nui are shareholders)
Investment in CIMTECH: $560,000 in pre-seed investment in 2010 and a further $800,000 in 2011 for further R&D.	Improved livelihood security for staff (through employment).
	Social recognition regarding Cook Islands traditional medicine, and particularly for recognition of the role of the Koutu Nui as a cultural authority involved in conservation-oriented practices like Raui.

(See: Robinson & Romagiano, 2010).

CIMTECH has since launched its skincare line called 'Te Tika'. The company has completed construction of a processing facility and laboratory on Rarotonga, equipped for plant processing and oil extraction. All agricultural production and supply for CIMTECH is done by Cook Islanders in the Cook Islands (Robinson, 2012; United Nations Development Programme, 2018). In 2014, an Australian company, Parnell Pharmaceuticals acquired a license from CIMTECH for two bio-active compounds for research and development of veterinary medicine, the license is perpetual and exclusive.

Benefit sharing in Australia

Pertinent laws in Australia

Biodiscovery laws across Australia vary between States. Queensland is reputed as one of the most biodiverse states in the country, and the regulatory framework for biodiscovery in this State is the Biodiscovery Act 2004 ("the Act") (Queensland Government, 2004). This legislation establishes the process for obtaining consent to access biological resources and for sharing benefits derived from their use. The amendments made to the Act in 2020 introduced specific provisions pertaining to TK, aligning the legislature more closely with the Nagoya Protocol (Queensland Government, 2021).

The reforms to the Act included the development of a code of practice for biodiscovery, which creates an obligation for biodiscovery entities to:

1. Identify the custodians of TK;
2. Obtain their free, prior and informed consent for their TK to be used;
3. Establish a benefit-sharing agreement with mutually agreed terms;
4. Where possible, to obtain consent and a benefit-sharing agreement prior to the use of publicly available TK;
5. Provide the opportunity for custodianship claimants to consent and negotiate benefit sharing even if biodiscovery has commenced; and
6. Provide evidence to the State of code compliance.

The law change also requires biodiscovery entities, including those initiated or led by First Nations peoples, to ensure all reasonable and practical measures are taken to ensure that TK is not used unless an agreement with the custodians of the TK has been reached. Consent given by TK custodians can also be withdrawn or renegotiated at certain agreed-upon intervals.

These obligations apply to native biological material throughout the state, and biodiscovery entities must uphold these obligations in relation to TK even if the collected material is not found within the state lands.

When a biodiscovery entity wishes to access and use native biological resources from Queensland State lands or waters, a benefit sharing agreement with the State must be established prior. TK obligations apply only when TK is being used, and if both TK and native biological materials are being accessed and used, approvals and agreements with both the State and the First Nations community must be in place beforehand. These agreements are distinct, and the State does not become a party to any TK agreements between the biodiscovery entity and the TK custodians.

Bulugudu and Spinifex

Spinifex grass has a rich history of traditional use among First Nations communities, including shelter-building, waterproofing, adhesive binding and medicinal purposes. The uses of the plant as well as its cultivation is considered to be TK held by multiple First Nations communities, reflecting an ongoing and sacred relationship to the species.

Recently, Uniseed, and Bulugudu Limited (formerly known as Dugalunji Aboriginal Corporation, representing the Indjalandji-Dhidhanu people of the Camooweal/Upper Georgina River), have jointly invested $2.6 million dollars into Trioda Wilingi, a spinout company based at the University of Queensland. This company focuses on developing medical gels from cellulose nanofibers extracted from the Spinifex grass harvested in Camooweal, north-west Queensland. Trioda Wilingi holds exclusive global rights to produce

novel injectable Spinifex medical gels, which have applications in osteoarthritis treatment, drug delivery and cosmetic procedures. The effectiveness of these products stems from the unique chemistry of Spinifex, yielding "stronger, thinner and more flexible nano-fibres." Importantly, the manufacturing process is environmentally low impact, distinguishing it from existing products on the market.

Previous outcomes from this relationship

The collaboration builds upon a long-term relationship established in 2007, which has resulted in significant research outcomes and the potential for various commercial applications. The research on Spinifex has led to advancements in agriculture, biomedicine and industry, showcasing the potential for sustainable and innovative uses of this resource.

In 2015, a patent was registered for a composite material "comprising an elastomer and nanocellulose derived from spinifex plants. The patent is owned solely by University of Queensland and not co-owned with the Indigenous partner." However, it was affirmed that the benefits arising from this project would be shared with the community in accordance with an existing research and collaboration agreement. These benefits included employment opportunities for First Nations youth, as well as "research on efficacy of regular spinifex burns, positive publicity for the university and respect for Indigenous cultural rights". Additionally, Bulugudu Limited was granted the right to veto any commercialisation efforts.

The patent highlights potential uses of nanocellulose in materials such as condoms and low-cost carbon fibre, but it does not disclose or mention any association with TK or First Nations partnerships. Until recently, under WIPO regulations there was no requirement to disclose whether patents for inventions are materially or directly based on genetic resources and associated TK. However, the recently adopted Treaty on Intellectual Property, Genetic Resources and associated TK (World Intellectual Property Organization, 2024b) has addressed this issue, with new requirements for disclosure based on indigenous knowledge.

This project resulted in the successful development of a condom that is as thin as human hair, showcasing the innovative applications of spinifex-derived nanocellulose.

Benefit Sharing

A commitment has been made to allocate an undisclosed percentage of all royalties generated to an Indigenous Education Fund at UniQuest (the commercial arm of the University of Queensland). This fund aims to enhance training and education opportunities for First Nations Australians, contributing to capacity building within the community (AusBiotech, 2023).

The IP and patenting rights for the developed gels will be shared equally between the University of Queensland and Bulugudu Limited. This equal distribution provides both parties with substantial potential for future financial returns.

Chuulangun Aboriginal Corporation

The Chuulangun Aboriginal Corporation, representing the Kuuku I'yu Norther Naanju families of the Upper Wenlock and Pascoe Rivers in the Central Cape York Peninsula of Queensland, plays a crucial role in advancing research to enhance social and economic outcomes for its community. Currently, the corporation is spearheading research initiatives centred on medicinal plants in collaboration with the University of South Australia. A key paradigm shift within this case is the shift from TK custodians as collaborators and researchers rather than bystanders in the form of stakeholders or informants. Currently, the investigation is centred on the treatment of psoriasis.

This research, which began in 2013, is enabling scientific exploration of the components and medical applications of several key traditional medicinal plant species, marking the first comprehensive investigations into their potential benefits.

The collaborative research agreement made between the Corporation and the University-based researchers covered protection of indigenous IP, expectations around confidentiality and benefit sharing mechanisms in the instances of future commercialisation. The agreement also affirmed that background IP remains within the ownership and control of the TK custodians, is acknowledged when new IP is generated, which would be subsequently jointly held. The TK would also be treated as confidential information. The collection of plants was to be done by the community according to their customs, and when placed into a collection, the indigenous provenance information remained attached within the metadata. Commercialisation was only to be done when jointly agreed, and it was also agreed that publications of research findings were to be jointly published.

Part of the negotiated benefit sharing arrangement outcomes included the naming of TK custodians as inventors on the patents produced out of the project and being named as an author on the academic works that have subsequently been published.

Kakadu Plum Case Study

Traditionally, Kakadu Plums have been valued for both their nutritional and medicinal properties, particularly for their antiseptic qualities. In contemporary times, these plums have found application in culinary creations like teas and jams, as well as in cosmetic products, owing to their rich vitamin C content.

An international patent application filed by Mary Kay Inc in 2007 for the Kakadu plum was rejected due to the absence of an inventive step, as the uses of the plums were already well documented and widely recognized. This lack of novelty was also assessed by the Australian Patents Office in 2010, leading to the withdrawal of the patent application in Australia following significant public pressure. The rejection of the patent application was attributed to the well-established traditional and contemporary uses of the Kakadu plum, which significantly diminished the novelty of its potential applications.

Despite the rejection in Australia, the patent application was successful in the United States. Notably, there is no documented evidence of approvals, consultations, or discussions between the patent holder and the First Nations communities from either Northern Territory or Western Australia. The supplier of Kakadu plums listed in the patent application was identified as an independent commercial entity, and since the plums were allegedly not "accessed" from the Northern Territory, the region's access and benefit sharing laws were deemed inapplicable.

Subsequently, as demand for Kakadu plums has surged, there have been several missed opportunities for Indigenous communities associated with the production of these plums. This is evidenced by the existence of 19 patents and applications internationally related to the Kakadu plum, with several assigned to Mary Kay Inc. These overseas patents have restricted the ability of Kakadu plum-producing communities to export their products.

Aotearoa examples

Ngāi Tahu and Mea fragrance

An example of benefit sharing in Aotearoa is with Ngāi Tahu, who have official recognition of its deep ‘cultural, spiritual, historic, and traditional association; with its land and resources’ (New Zealand Government, 1998).

One biological taonga known as Taramea (*Aciphylla aurea*), is a sub-alpine speargrass species. Ngāi Tahu has obtained legal acknowledgment of its ‘rangatiratanga’ and ‘mana’ concerning the territories where taramea flourishes (New Zealand Government, 1998)

MEA is branded under Taramea Fragrance Ltd. and is part of Kāti Huirapa Rūnaka ki Pūketeraki (Puketeraki), within the wider iwi of Ngāi Tahu. Puketeraki Rūnanga launched a business project to gather and refine Taramea for making perfume oil, a revival practice of the Ngāi Tahu tradition of perfume making (Anderson, 2024).

This venture is based on connection with Taramea while exploring avenues for social and economic gain through Puketeraki’s development of Taramea as a global market commodity (Ruckstuhl, 2023). The oil was packaged and sold to the wider Ngāi Tahu community, both through Ngāi Tahu tourism shops and online. It was founded to help their people enhance their leadership and create long-lasting economic benefits.

Anderson (2024) states that the Mea business model lies at the intersection of provenance and authenticity, attributes highly sought after by consumers. She goes on to state that indigenous narratives, harvesting practices and other methods contribute to the construction of provenance and authenticity. These elements, which encompass indigenous community involvement, tk and storytelling, collectively establish a sense of legitimacy in Mea products (Ruckstuhl et al., 2023).

As part of the commercialisation process Puketeraki assessed the legal and extra-legal mechanisms against a range of Indigenous and commercially oriented attributes (Ruckstuhl et al., 2023).

Table 5: Assessment of legal and extra-legal protective mechanisms

Mechanism		Attribute						
		Protects *knowledge relationship* to resource	Mechanism can be Indigenous-controlled	Attests Indigenous *control* of resource	Attests Indigenous *provenance*	Durable [inter-generational]	Costly	Well-known in market
Legal	Trademark	Y	N	N	Y	Indefinite	N	Y
	Copyright	Y	N	N	Y	Generally – 70 years	N	Y
	Patent	N	N	Y	N	Generally – 20 years	Y	Y
Extra-legal	Supply chain Auditing	Y	Y	N	Y	N	Y	Y
	Blockchain	Y	Partially	Y	Y	Y	N	Partially
	Biocultural Trademark	Y	Y	Y	Y	Y	N	N
	Biocultural Labels	Y	Y	Y	Y	Y	N	N
		Indigenous-oriented attributes				Market-oriented attributes		

Y = Yes; N = No.

Ora innovation ltd.

Ora Innovation New Zealand Ltd (OINZL) is an agribusiness developed by three sisters from Ngāti Kahungunu, promoting mātauranga Māori practices to sustainably harvest and scientifically validate the healing properties of the rongoā native plants of Aotearoa including mamaku (Black tree fern). OINZL began as a modest cottage industry and has now evolved into a globally commercialised product. This transformation underscores the imperative to uphold cultural, ethical, accountable, and sustainable practices, emphasising OINZL's commitment as a responsible Māori agribusiness entity (Anderson, 2024).

OINZL has established a value chain with distinct cultural attributes that contribute to safeguarding the mamaku agribusiness for Māori whānau and, by extension, for the broader Aotearoa New Zealand. Some guiding principles encompass, but are not limited to the following (Anderson, 2024):

• Provenance – the product's origin must be verifiable and traceable back to the whānau and their cultural roots.

• Traditional methods and materials – The creation of the product should adhere to traditional methods and materials, passed down through generations within Māori and indigenous communities.

• Fair trade and ethical sourcing – The product must be sourced and produced ethically, ensuring fair wages and working conditions.

• Cultural sensitivity – Both the product and its packaging should show respect for Māori culture, avoiding the perpetuation of stereotypes and misrepresentation.

• Quality – The product should be of high quality and well-made, using techniques as closely aligned as possible with traditional methods.

• Authenticity certifications – The product should obtain certification from an independent organisation, confirming both its authenticity and compliance with the above guiding principles.

• Community participation – The product should have the participation, consent and benefit of the whānau.

• Sustainability – Production and distribution should be carried out sustainably, considering its environmental impact and the well-being of future generations.

OINZL acknowledges the integral role of Māori whānau within the mamaku supply chain who are suppliers of mamaku from their land blocks. These whānau play a key role in upholding values such as manaakitanga (generosity, support), whakaute (respect, care for), and kaitiakitanga (custodianship, guardianship).

Fashion and entertainment

Fashion

Like all industries, within fashion there is a growing awareness for equity and inclusion. An example of this is the model Quannah Chasinghorse at a fashion show, where she was celebrated for her Indigenous presence with her "*traditional Hän Gwich'in face tattoos and the authentic Navajo turquoise jewellery that complemented her Peter Dundas gown*" (Cernansky, 2021).

There are growing questions surrounding fast fashion and environmental sustainability (Sensei, 2020). Sustainability is necessary for survival, be it the survival of our physical planet and natural environment or that of cultural societies (Sensei, 2020). The fashion industry is also aware of issues of sustainability which cannot exist without ethics and the

importance of environmental and social justice as two sides of the same coin (Platform, 2021). We rarely take into consideration the idea of 'sustainability' as something that can be applied to culture. Promises of sustainability cannot be made ethically against the backdrop of cultural insensitivity (Sensei, 2020). There is a history of cultural appropriation in the fashion industry which can be defined as "Cultural appropriation", or the act by a member of a relatively dominant culture of taking a Traditional Cultural Expression (TCE) and repurposing it in a different context, without authorisation, acknowledgement and/or compensation, in a way that causes harm to the TCE holder(s) (Bota-Moisin & Deshmukh, 2020).

Cultural appropriation and cultural insensitivity diminishes the value of these cultural expressions and a lack of power, consent, credit and compensation to the marginalised communities (Platform, 2021). The insensitivity derives from an assumption that TK is part of the public domain and hence available for everyone to use (Boța-Moisin & Deshmukh, 2020). Cultural ethics that must go along with environmental sustainability should include cultural preservation (Platform, 2021). With cultural preservation, the industry can enhance systems of value and celebrate, based on deep cultural appreciation, and allow for the continuation of age-old cultural expressions (Moisin, 2021; Platform, 2021).

TK is a thriving and living body of knowledge that is developed, sustained and passed on for generations, helping form the cultural and spiritual identity of the community (Bota-Moisin & Deshmukh, 2020).

> (Intangible) Traditional cultural expressions (embody TK): cultural practices, signs, symbols, names, musical expressions, dance, rituals, and lifestyles.
>
> (Tangible) Traditional Cultural Expressions: jewellery, garments, headpieces, traditional instruments, architectural forms, pottery, woodwork, textiles.
>
> Traditional = cultural continuity: the word traditional is used not because the knowledge is old. It expresses a long-term link with a community, meaning that it is developed, sustained, and passed on within a community, often being part of their cultural and spiritual identity[6] (Moisin, 2021)

Liberal society has removed the connection to cultural knowledge and items such as clothing and when communities push back, they are used to everything being open access for all to use that it feels 'unfair'. This problem stems from the fact that there is no framework in place to regulate and reduce occurrences of cultural appropriation and that fashion is considered too utilitarian for copyright protection. In turn, fashion and textile industry stakeholders - brands, designers and customers - need to show more cultural empathy and awareness of the fact that cultural appropriation can diminish the cultural

[6] Webinar available at - https://www.youtube.com/watch?v=UP3kksf6NIw&t=7s

value associated with the TK and/or TCE, and of the craft related to it (Bota-Moisin & Deshmukh, 2020).

The fashion industry is increasingly aware that they have not had an appropriate relationship building and benefit sharing with the communities from where the knowledge and ideas have come from. Some organisations are beginning to broker and support Indigenous communities and their fashion, knowledge and clothing.

Nest is an organisation that aims to build a new hand worker economy to increase global workforce inclusivity, while connecting craftspeople, brands and consumers (Relevé Fashion, 2024). It works across 70 countries across 5 continents, including India, Bangladesh, Mexico, Morocco, Nairobi and many others.

Roots Studio realises the communities need support in getting their artesian ware to customers (Roots Studio, 2024). The organisation aimed to work with community leaders to amplify voices, preserve endangered heritage creativity and facilitate economic sustainability through art. It builds long lasting relationships with Indigenous artists globally and brought the extraordinary art of Indigenous people from Asia, Africa and Latin America to Western designers, textile manufacturers and fashion companies. Roots help by providing licencing for artists work and also provides training whether it be financial knowledge, digital literacy, understanding market trends, and more (Roots Studio, 2022).

There is no framework to regulate or reduce occurrences of cultural appropriation and the fashion industry is considered too utilitarian for copyright protection (Bota-Moisin & Deshmukh, 2020). One idea being supported in the fashion industry is the 3-C Rule. An important condition for the Rule to provide its intended outcome is for the three elements - (1) informed consent, (2) source acknowledgement, and (3) fair and equitable financial or nonfinancial compensation - to be simultaneously fulfilled. They cannot be used in isolation. The 3-C Rules therefore is based on the notions of "consent", "credit" or source acknowledgement, and "compensation", in relation to elements of TK and TCE (Bota-Moisin & Deshmukh, 2020).

Credit: Bota-Moisin & Deshmukh, 2020

Ethical and fair uses of elements inspired by TK and TCEs belonging to an Indigenous or local community, a craft community or individual artisans, imply the completion of the following steps cumulatively:

- **Consultation with the custodians/owners** prior to the use of their expressions, transparent disclosure of the intended purposes of the use and acquisition of free, prior and informed consent;
- **Acknowledging the source(s)**, the originators;
- **Sharing the benefits** of the commercial use with the originators.

Recently, the WIPO has released draft consultation guidelines for use when considering the use of elements of indigenous peoples' TCE in fashion (World Intellectual Property Organization, 2024a). These draft guidelines highlight six steps that fashion companies are invited to consider if they plan to approach or engage with an Indigenous community regarding the use of elements of its TCE in a design or project. These six steps are:

1. **Research cultural significance**

"*Inappropriate use of a sacred or secret cultural symbol or design may cause considerable spiritual offence to an Indigenous community. A cultural significance due diligence check will help in developing a deeper understanding and appreciation for a community's cultural expressions and provide clues as to how to use them in an appropriate and respectful manner*."

2. **Conduct relational research**

"The traditional holders or custodians of an Indigenous Peoples' cultural expressions are usually determined in accordance with their customs, protocols, laws and practices. Actively reaching and seeking out the right person(s) or body within a community will allow you to learn more about the cultural expression that is of interest to you and its appropriate and ethical use."

3. **Build relationships and trust**

"*This involves engaging in open and transparent dialogue, actively listening to a community's concerns and aspirations, and demonstrating a genuine commitment to collaboration. The relationship should be nurtured prior to and throughout the collaboration."* The document then provides several key aspects to consider, such as time investment in relationship building, approaching with respect and understanding of 'indigenous ways'.

4. **Reach an agreement**

"The process of reaching an agreement with the holders or custodians of a cultural expression should follow the principle of prior and informed consent and the terms of the collaboration should be mutually agreed."

5. **Give acknowledgement and attribution**

"Indigenous Peoples are the best interpreters of their own stories, of their culture and its elements. They should be consulted on how to communicate appropriately about their values and cultural expressions."

6. **Share the benefits**

"Various types of benefits can be considered, including monetary and/or non-monetary benefits. Benefits should be negotiated on mutually agreed terms and should be based on the community's priorities and needs."

These draft guidelines were released in advance of a series of online workshops to discuss their applicability to the fashion industry. The results of the workshops have not been released yet, nor the guidelines finalised.

Entertainment

Art and entertainment are a central pillar of Indigenous peoples and have always been a core part of their culture. Indigenous heritage comprises the objects, sites and knowledge that has been transmitted from generation to generation and thus it is still a living process (Janke, 2019; Quiggin, 2002). 'Arts and entertainment' as they are referred to includes writing, performing, song, the visual arts along with other new medium and media in the technological space are also ways of transmitting Indigenous cultural heritage (Quiggin, 2002).

There is an idea based on Western concept that an artist is the creator. However, from a traditional or Indigenous perspective, the Indigenous artist is the custodian of culture and the obligations and privileges that go with that (Quiggin, 2002).

There is a growing interest in Indigenous forms of art and entertainment and its output into the public sphere. There have been few reviews of its impact. The *National Indigenous Music Impact Study* aimed to address such a gap in knowledge (NVision Insight & APTN, 2019). The study looked at how Indigenous musicians were situated within the music industry.

Guides and protocols have been produced for those in the arts and entertainment sector to ensure that any use of TK in its production (Nickerson., 2019; Quiggin, 2002). Although they are not agreements in themselves, they provide important considerations for both the Indigenous communities and those considering the use of, or gaining inspiration from, Indigenous art and entertainment (whether they are Indigenous themselves or not).

One such publication is *Protocols for using First Nations Cultural and Intellectual Property in the Arts* (Janke, 2019). It first sets out Indigenous cultural and intellectual property and the various rights and interests associated with it. It then follows with 10 principles: respect; self-determination; communication, consultation and consent; interpretation; cultural

integrity and authenticity; secrecy and confidentiality; attribution; benefit sharing; continuing cultures; and recognition and protection. It then finishes with some case studies which range from visual arts, music, writing/literature, dance, theatre and events. The case studies gives an overview of how the principles feature within the use of Indigenous culture and knowledge although it does not provide the agreements themselves.

Another publication is *Pathways & Protocols: a filmmaker's guide to working with Indigenous people, culture and concepts* (Janke, 2019). This document discusses the principles for protocols for respect of Indigenous culture and heritage and the communities from which it derives. It then provides guidelines on use within film practice. It provides a broad discussion of film and the law as it applies to issues of cultural intellectual property. The appendices provide some example agreements and sample clauses to be included in agreements.

A further publication is *Cultures Song: protocols for producing Indigenous Australian music* (Quiggin, 2002). The publication covers some principles and protocols to keep in mind concerning Indigenous music. It then continues by explaining copyright and issues involving copyright. Lastly it focuses on 'follow up' that centres on applying protocols for example with Indigenous control, secrecy, attribution, proper returns, continuing cultures, and recognition and protection.

Finally, the document 'On-Screen Protocols & Pathways: A Media Production Guide to Working with First Nations, Métis and Inuit Communities, Cultures, Concepts and Stories' (Nickerson., 2019) outlines some screen-based protocol principles: respect, responsibility, reciprocity, consent, and an overview of Indigenous story-telling consent process. The appendices provide important resources for communities and the industry. These support ideas include sample code of conduct and safety protocols as well as many others.

Mining

Indigenous Ainu and Orok (Eastern Russia) and Sakhalin energy

Wilson (2019) provides an example of gas exploration in Eastern Russia, regions with significant populations of Indigenous peoples, who have developed their own regulations governing extractive industry activities, including benefit sharing. On Sakhalin Island, there are two large gas companies in operation - Exxon Neftegaz Limited, a subsidiary of ExxonMobil, which is the operator of Sakhalin-1 and Sakhalin Energy, the operator of the Sakhalin-2 consortium.

The Sakhalin-2 project sought to secure project finance from the European Bank for Reconstruction and Development (EBRD) for further development of the project. In 2005,

following protests by the local Indigenous resource-users, the EBRD asked the proponent company Sakhalin Energy to prepare and implement an Indigenous peoples' plan (Roon, 2006). The protests were able to place such pressure on Sakhalin energy, as due to international financial standards adhered to by the EBRD, the company must take the interests of the local communities into account and resolve any emerging conflicts during the construction process.

The Sakhalin Indigenous Minorities Development Plan (SIMDP) was launched in 2006, with Indigenous governance structures in place, and has been running since then, with later involvement of the regional government and with plans employing an FPIC process to reach agreement (Guldin et al., 2010).

Sakhalin Energy set up a management structure, which included an advisory board, executive committee and two program committees. The committees focused on social programs and supporting traditional resource use. The first focused on financing health, culture and education projects. The second was connected with providing financial support to indigenous family enterprises and giving them the opportunity to buy necessary equipment, such as motors, machine tools and boats (Tulaeva & Tysiachniouk, 2017).

The main management role is held by representatives of the Indigenous people. This provides opportunity for local residents to determine priorities in distribution of funds for social projects and made it possible to include local Indigenous residents in discussing issues that were important to them, local projects and initiatives, and made sure that their interests and needs were taken into account. On the other hand, the chance to influence the distribution of these funds led to internal conflicts among the local communities. International experts regularly evaluate the approach.

In contrast, Exxon Neftegaz adheres to a Paternalistic model of benefit distribution (Tysyachnyouk, 2016). This is a more 'classically Russian' model of benefit sharing, where the company takes a major role in decisions on how benefits are distributed. Similar to the approach by Sakhalin energy, Exxon set up an agreement structure with Indigenous peoples and local Oblast authorities and the company makes the main decisions on distributing the funds for social projects and assigns benefits to education, culture and healthcare. It does not provide grants to support traditional economic activities by family entrepreneurs (Tulaeva & Tysiachniouk, 2017).

Wiradjuri and Barrick Gold mining

In 2003, Barrick Gold mining company reached an agreement with the Wiradjuri people of Australia, for the development of a gold mine near Lake Cowal in central New South Wales. The genesis of the partnership between the Wiradjuri and Barrick began nearly 10 years

earlier, and long period of relationship development is credited for the success in reaching an agreement with the Indigenous peoples.

As part of this effort, Barrick engaged with Wiradjuri communities to identify stakeholders and to share information and planning ideas. Establishing these relationships early on helped Barrick generate support from local communities to submit a formal Native Title Application to the government (International Council of Mining and Metals, 2013).

In Australia, Native title is the name Australian law gives to the traditional rights and interests that Indigenous groups have practised, and continue to practise, over land and water. Where native title exists, Federal and state governments are legally bound to follow the processes set out in the Native Title Act 1993 (Australian Government, 1993). The Wiradjuri are recognised as the Traditional Owners of the Lake Cowal area. For Barrick to successfully open a mine, a Native Title agreement had to be reached with the Wiradjuri.

Through a series of grassroots community meetings, local Wiradjuri leaders discussed the priorities for Indigenous people in the area, as well as their concerns about mining, the environment and heritage preservation. After consultation with the greater Wiradjuri Council of Elders, the Wiradjuri Condobolin people were elected as the official representatives for negotiations with Barrick.

The Native Title agreement was successfully enacted in 2003, and the agreement successfully established governance arrangements for the mine, leading to the formation of the Wiradjuri Condobolin Corporation (WCC). The WCC, operated by the Wiradjuri people themselves, was created as the legal entity to administer funding and manage programs under the agreement. WCC was established to facilitate business, education and employment opportunities for the Wiradjuri people. The WCC established the Wiradjuri Cultural Heritage Company that Barrick employed to manage Wiradjuri heritage protection activities during the mine's development and ongoing operation (Barrick Mining, 2010).

In addition to direct employment at the mine and the WCC, benefits to the local people included scholarships and traineeships for Wiradjuri youths and the establishment of several local businesses, as well as the construction of the Wiradjuri studies centre, a facility for promoting the study and understanding of Wiradjuri culture (International Council of Mining and Metals, 2013).

Although Barrick sold the mine in 2015, the WCC is still in operation and provides cultural programmes as well as counselling and mentoring to local people.

Discussion

In describing these examples across a variety of industries there are a wide range of benefit sharing practices, ranging from those that exist from the initiation of a project with the blessing and involvement of Indigenous peoples, through to those who were Indigenous peoples are an afterthought, and require legal intervention to ensure that their rights and interests are recognised and TK fairly compensated. There are several approaches to benefit dispersal, including financial and social benefits, to both Indigenous peoples directly involved with project, and to a wider Indigenous population. Key learnings from these examples are summarised below.

Drawing on the OECD description of benefit sharing models in **Table 1**, we can place the described examples in a matrix of indigenous partnership and benefit sharing, shown in **Figure 1**. This diagram shows what resource the benefit sharing example utilises – be it DSI, Genetic Resource(s) or more general TK.

This matrix contains a spectrum of benefit sharing models, based on the OECD models provided in the introduction. The matrix draws a distinction between examples where benefit sharing has been Court directed (San peoples), Government mandated (e.g. Brazilian government), an industry led partnership, or an indigenous led initiative. This spectrum also illustrates how the benefit sharing is dispersed to indigenous peoples and communities, as these benefits can be in the form of direct and indirect financial benefits and wider social benefits, such as upskilling and training, as well as other education and community benefits. The distribution model of benefits can also be via different methods. The Brazilian government provides an example of how this can be achieved through legislatively mandating the distribution of benefits both directly to the indigenous holders of a resource and via a contestable general fund.

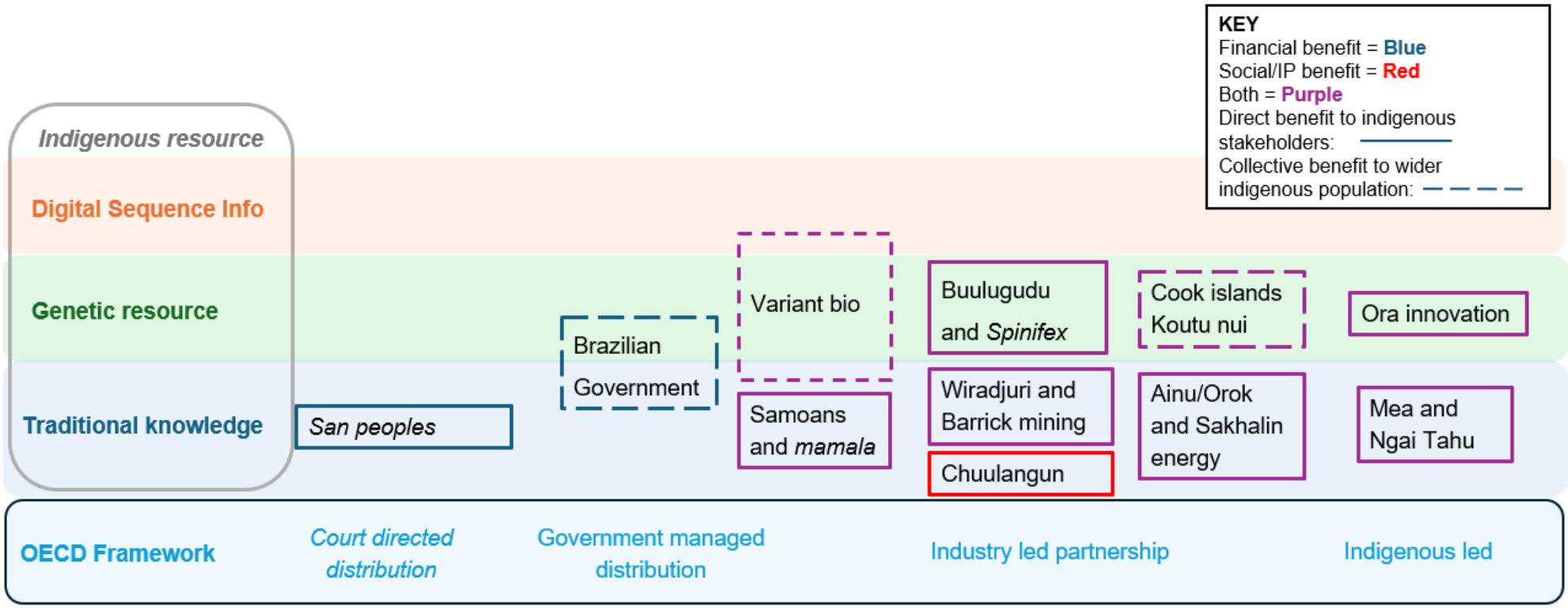

Figure 1: Indigenous benefit sharing matrix

The examples provided in the matrix of benefit sharing exist within a value chain. Different examples provide financial contributions to communities from different parts of the value chain as shown in **Figure 2** forming what might be called a 'Benefit Chain'. The further up the benefit chain, the more Indigenous involvement there in the business, and therefore a greater level of Indigenous control over the distribution of any financial benefits and associated non-financial benefits, including capacity building and upskilling of Indigenous populations.

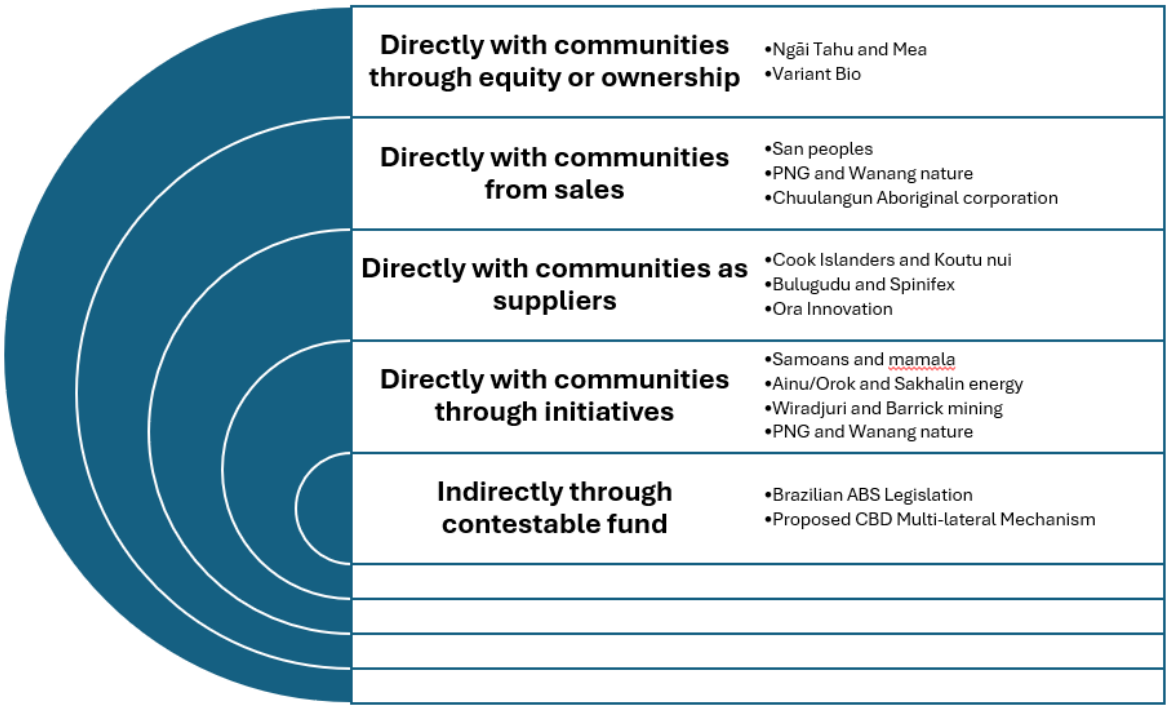

Figure 2: Moving up the Benefit Chain: Enhancing Financial Returns for Communities

Key Lessons

There are several key lessons that can be summarised from the provided case studies. Paramount is the necessity of regulating ABS agreements as mandatory before access to TK can be granted. Several cases highlighted previous, such as the Kakadu plum and *Hoodia gordonii* and the San peoples, exemplify how the lack of free, prior and informed consent and mutually agreed terms can not only hinder commercial opportunities but also impede the ability of TK holders to retain, maintain, control, protect or develop their knowledge over a particular species.

A further learning is ensuring the visibility of relationships and use of mātauranga or taonga through the use of provenance information. Examples are with the Chuulangun Aboriginal corporation where plants placed into a collection for potential future use in scientific

exploration had attached provenance information within the metadata. The MEA fragrance utilises provenance as a method of providing evidence of the product's connection to Ngāi Tahu tangata whenua and mātauranga, increasing its authenticity to its consumers. Anderson, (2024) states that Ngāi Tahu's construction of provenance, and thus authenticity, for its Mea fragrance products is through the use of indigenous narratives, harvesting practices and other methods. Local Contexts provides mechanisms for recording provenance within digital infrastructures through the Traditional Knowledge and Biocultural Labels. These tools are being used in a diverse range of institutional databases with the aim of supporting Indigenous recognition and maintaining opportunities for communities to participate in future research and commercialisation activities that use their traditional knowledge or biocultural material (Golan et al., 2022).

Many successful examples show the need for direct relationships with Indigenous peoples, through larger tribal/iwi groupings, smaller family/whānau groups or kaitiaki. Direct relationship building means Indigenous peoples are considered from early on in the project and affords them the greatest opportunity for involvement and input. Additionally, direct relationships enable the ability to directly negotiate with holders of Indigenous resources which provides the greatest amount of disseminated benefit to Indigenous groups from use of an Indigenous resource through negotiated bilateral agreements. Good examples discussed of this are that of the Cook Islands and the Koutu Nui and the Ainu/Orak and Sakhalin energy in Eastern Russia.

The opposite of this direct relationship building, and lack of bilateral agreements leads to enforced benefit sharing, which requires either direct legal or government involvement to ensure fair compensation for Indigenous peoples – and with greater recognition of Indigenous rights worldwide this is becoming more costly and time consuming for all parties involved.

Engaging directly and understanding the needs, rights and responsibilities of Indigenous peoples leads to further positive outcomes. For example, understanding that there may be multiple interests represented from engagement with mātauranga holders, and therefore there may be a need to develop mechanisms for the development and enactment of multilateral mechanisms. Apart from the Brazilian legislation and the San/Hoodia examples highlighted earlier, examples of multilateral agreements or mechanisms are few and far between. Internationally a proposed multilateral mechanism is being negotiated for DSI in the CBD (UN Environment programme, 2022).

Indigenous peoples worldwide share the approach of guardianship and sustainability over their TK. This is often at odds with a traditional western scientific approach to the use of IP and can be best visualised in the diagram shown **Figure 3**, where concepts related to TK/mātauranga and taonga exist on various spectrum. For example, indigenous approaches to IP tend to be shared, whereas western IP approaches focus on exclusivity and benefit extraction. Indigenous peoples collectively take responsibility for TK, and see kaitiakitanga as

a shared responsibility, as opposed to individual ownership over IP. It is these relational challenges that must be understood when engaging and developing benefit sharing agreements.

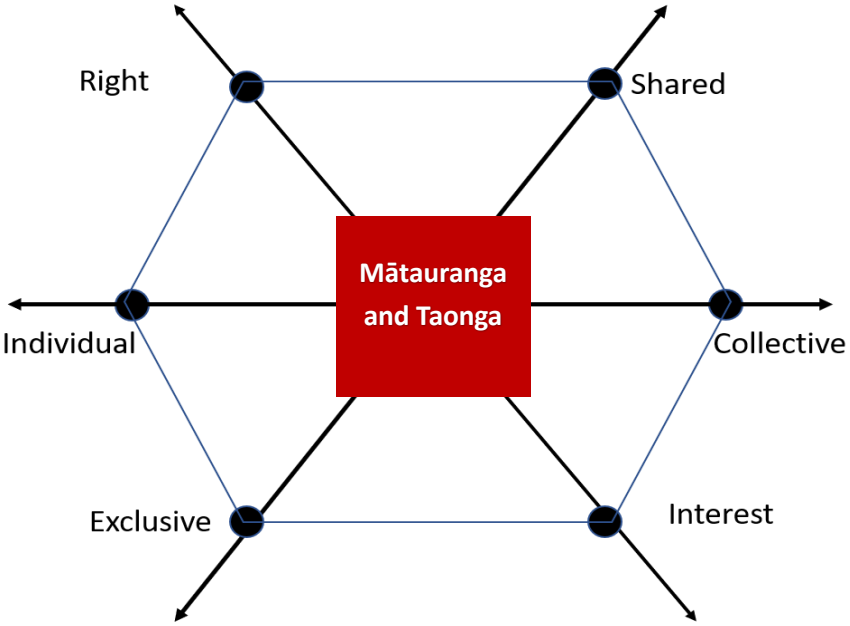

Figure 3: Relational challenges in understanding indigenous approaches to IP

How should Aotearoa approach biodiscovery and benefit sharing?

In developing a biodiscovery and benefit sharing regime, Aotearoa can draw on experiences of other nations and the examples provided. Each country or benefit sharing approach has particular needs and requirements for legal and policy regimes. In distilling these examples, Aotearoa can forge its own path in a uniquely Māori way while ensuring compliance with its international obligations in forming a biodiscovery and benefit sharing regime. In moving towards such a regime, the following *principles* could inform its development:

1. Support the sustainability of taonga
    a. Fund should support biodiversity and/or mātauranga
2. Make visible relationships with taonga
    a. Provenance information for iwi, hapū and kaitiaki should be recorded
3. Promote direct relationships with iwi, hapū, whānau, and/or kaitiaki
    a. Bilateral agreements should be used as much as possible
4. Recognise monetary and non-monetary benefits
    a. Promote short-term and long-term benefit mechanisms
5. Recognise multiple interests
    a. Benefits shared with first movers as well as the broader kaitiaki community
6. Ensuring benefit sharing from the use of all taonga

a. Develop multilateral mechanisms – ensure a pathway for benefits for challenging contexts (multiple stakeholders)

7. Recognise rangatiratanga and rights to taonga
    a. Māori governance of multilateral mechanism
8. Moving up the benefit chain
    - Create opportunities for Māori to benefit across all parts of the value chain

Using a hybrid approach, it is possible to harness the benefits of Nagoya Protocol style bilateral access and benefit sharing systems alongside the proposed CBD multilateral mechanism for DSI (UN Environment programme, 2022). The hybrid approach provides the greatest coverage and potential quantum available for benefit sharing to rights holders and/or kaitiaki. **Figure 4** outlines this approach which allows for both direct benefit to mātauranga holders through bilateral agreements, and also for a multilateral mechanism that provides a 'Kaitiaki fund', which is accessible to the wider Māori population.

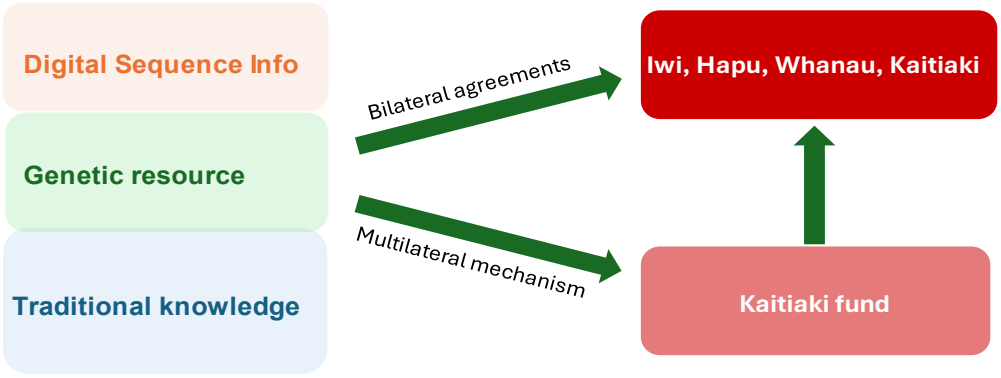

Figure 4: Hybrid Approach to Benefit Sharing

Table 6 provides an example of potential settings for NZ ABS legislation and how they would compare against the existing Brazilian legislation and ongoing CBD negotiations. The Variant Bio example represents the upper limit for known commercial agreements.

Table 6: Comparison of Benefit Sharing

Agreement type	Possible Bilateral NZ	Possible Multi-lateral NZ	Proposed Multi-lateral CBD	Actual Multi-lateral Brazil	Actual VariantBio
Digital Sequence Information	1.5%	2.0%	1.0%	1.0%	4%
Genetic Resources	1.5%	2.0%	1.0%	1.0%	4%
Traditional Knowledge	*Direct Negotiation*	1.0%	TBC	0.5%	N/A

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