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THE HIGHLIGHTS

Toy creating workshop with pupils and teachers, 2010, Instituto de Formacion Docentes de Bariloche, Argentina, photo by the author (Rossie, 2013, 278-280).

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ON THE COVER

Confederation of Indigenous nations of the Middle East and North Africa (CINMENA)

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LUKANKA

Lukanka is a Miskito word for "thoughts"

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RUDOLPH C. RŸSER
Editor in Chief
Fourth World Journal

"For every problem, there is an acceptable solution," -- every optimist repeats while looking to the abyss of a crisis. Fourth World peoples are eternally optimistic, acting to devise new and creative solutions to intractable problems. Some of the most conservative societies among the more than five thousand nations demonstrate confidence in their ability to adapt—to meet environmental, social, economic, and cultural change. Yes, these nations are, by their nature and success over hundreds of generations, "conservative." They are cautious, studied, traditional, and able to make changes incrementally.

I have noted in these pages the various crisis of nature and troubles experienced by Fourth World nations resulting from human actions or inactions over the years. Indeed, most disruptions, forced dislocations, and violence committed against Fourth World nations are perpetrated by human actions or indolence. Some examples of crises perpetrated against Fourth World nations by human actions usually involve a state, corporation, or other Fourth World nations aggressively entering ancestral territories to use land or resources without a nation's consent. While aggressions against these nations have dominated for the last 530 years in the last four years, these examples call for our attention:

• Fourth World nations in Burma (attacked by a military criminal enterprise taking over the government of Burma to control oil, gas, and minerals).

• Nations in Eritrea and Ethiopia (including the Oromo, Tigray, Amhara, and Tigrinya) have engaged in a bloody and genocidal war since November 2020,

• The Lithium Nevada mining company, supported by the US government, occupied Paiute ancestral lands without their consent to dig an open-pit mine,

• Gas pipelines across Standing Rock Sioux ancestral lands; Israel's occupation of Palestinian territory,

• Nicaragua/China Grand Canal construction across territories of the Miskito and Rama peoples,

• The Yezidi of Ezidikhan has suffered bombings, militia attacks, assassinations, and

violence against their villages in the last four years after vicious attacks since 2014, killing and enslaving ten thousand of their people by Wahabis, ISIS, Turkey, the Kurdish Regional Government, and the Kurdish Workers Party (PKK).

At the end of 2021, more than 89 million people have been forcibly displaced because of persecution, conflict, violence, and human rights violations, including genocide in Syria, Venezuela, Afghanistan, South Sudan, and Burma. Children make up 41% of the displaced peoples. Perhaps the most telling measure of threats and dangers nations must endure in the 21st century are states' governments that combine their corruption and instability with the profit motives of transnational corporations engaged in resource extraction, deforestation, and environmental destruction. States such as the Democratic Republic of Congo, Yemen, Syria, Chad, South Sudan, Somalia, and Iraq hold within their boundaries the ancestral territories of more than 450 Fourth World nations. As with virtually all countries, corporate resource exploitation is primarily carried out inside the nations' territories for the financial benefit of political leaders and profit-making businesses.

Fourth World nations have themselves on which to depend on defending against the crises—natural and human-made. Each nation must develop its defenses, organize alliances, and create new international mechanisms to establish new rules for the conduct of relations between nations, states, and corporations. The Fourth World Journal has served nations by offering analysis and information applying traditional knowledge systems to advance traditional healing arts and sciences and formulate strategies and practices to effect constructive results for the present and future of nations.

We continue this tradition in this issue with practical and concrete essays by CWIS Associate Scholars and some of the finest minds of and in support of the Fourth World. We publish several articles in this issue in English and Spanish to benefit of our global audience.

Public Information Bureau Chief for the government of Ezidikhan Patrick Harrigan contributes the hopeful and information-packed article **Ezidikhan Rises from Genocide: 66 Indigenous Nations Establish Middle East/ North Africa Confederation** describing the proactive work of Prime Minister Barjis Soso Khalaf, Justice Minister Nallein Sowilo, and the Governing Council to restore the Yezidi after the vicious Islamic State (ISIS) and genocidal attack in 2014. Harrigan reveals subsequent attacks and occupations by the Kurdish Regional government and bombings of Yezidi villages by the government of Turkey as well. This remarkable account demonstrates the resilience of this ancient nation as it formed a central government over forty-two villages and began working to establish a legal mechanism to establish accountability for crimes committed.

Moroccan Anti-Atlas Amazigh Children's Play and toy Heritage in a Developmental and Intercultural Perspective is a further elaboration of the work of Belgian scholar **Jean-Pierre Rossie**. He expands on his 2019 FWJ published article "Amazigh Children's toys and Play Cultures." In this article, Rossie further advances his goal as a researcher and author

of children's toy and play heritage in Northern Africa, reflecting how he seeks to encourage the union of the toys and play onto "humanity's tangible and intangible heritage." This article is a beautiful account of play and invention.

Associate Scholar Dr. Amy Eisenberg begins her article with a physical injury in ***Tuhke Koaros mie Koasoaiepe de Poadope* – Every Tree has a Story** and tells a story of a traditional healer's sharing and the bountiful knowledge of foods and medicines in Pohnpei, Micronesia. Dr. Eisenberg's beautifully written and illustrated tale of recovery and of plants and treatment with the help of traditional healer Sounwini Lepen Lison Leon Aldis urges one to realize how valuable and profound ancient knowledge is to the health and well-being of people. Relatively small communities of Fourth World peoples remain a bountiful store of wisdom that continues to benefit human societies.

Sidestepping the Climate Change Juggernaut: The Potential for Staple Crop Polycultures and Passive Solar Greenhouse Systems to Safeguard Food Security is the title of **Cora Moran's** most recent article explaining the benefits and practical ideas behind permaculture methods that offer an alternative to mechanical agriculture for the efficient production of staple food crops. Like the practice of the Fourth World system of *kalhaculture*, Moran's discussion of permaculture examines how the method may aid in "sidestepping" the adverse effects of climate change—that she considers unstoppable now. Her discussion explores approaches to adaptation that are essential to needed to secure human survival.

In the last issue of the Fourth World Journal (Vol. 21 N.2), the FWJ published five experts' analyses effects of resource extraction in ancestral territories by the CWIS-sponsored Extractive Industries Initiative Panel (EII Panel). They explored six possible strategies for Fourth World nations to employ to control, regulate or prevent transnational resource extraction corporations from entering or seeking to enter ancestral territories. CWIS Chair and Executive Director **Rudolph C. Rÿser** amplifies the Panel's analysis in this peer-reviewed article. He asks how high-tech economies seeking to replace oil and gas with electrical energy contribute to climate change and human rights violations if they want to mine minerals from Fourth World territories. In **Green Energy Mining and Indigenous Peoples' Troubles: Negotiating the Shift from the Carbon Economy to Green Energy with FPIC**, Rÿser discusses how unregulated mining and resource exploitation in Fourth World ancestral territories is often more damaging to the environment, the climate, and Fourth World peoples. Obtaining the Fourth World nations' consent to enter and access land and resources under rules defined by the nations is essential to curb unrestrained extraction and consumption of metals, minerals, and lands that make electronic energy possible.

Ezidikhan Rises from Genocide:
66 Indigenous Nations Establish Middle East/North Africa Confederation

By Patrick Harrigan

ABSTRACT

For more than 6000 years, Yezidi have celebrated their place in the fertile region between the Tigris and the Euphrates Rivers in Mesopotamia. Now they are situated in the states of Syria, Iraq, Turkey, Armenia, and Iran. Since the formation of the Ottoman Empire (1300-1922), which was originally established in Anatolia—the location of contemporary Turkey, the Yezidi have suffered innumerable crises threatening their lives and property including numerous genocides.

The Yezidi government of Ezidikhan leads the effort to form the first multi-region indigenous nations' Confederation forming the Confederation of Indigenous Nations of the Middle East and North Africa (CINMENA). Having suffered massive genocidal attacks, the Yezidi Justice Minister Nallein Sowilo is described as having confronted the attacks on her people by the Islamic State in 2014, establishing the Confederation and initiating the effort to establish the Nations' International Criminal Tribunal.

Keywords: Mesopotamia, genocide, Kurdish Regional Government, Iraq, Confederation, Tribunal

With little fanfare, many Indigenous nations, and community organizations spanning the entire Middle East and North Africa have set mutual suspicion and mistrust aside to form this vast region's first-ever bloc of Indigenous nations. While these nations or communities differ vastly, they share a genuine desire to govern themselves and decide their destinies free from outside interference.

The origin of the Confederation of Indigenous Nations of the Middle East and North Africa (CINMENA) may be traced to the 2014 assault by ISIS extremists upon the Yezidi nation of Ezidikhan in northern Iraq. Still, its roots extend far back to the dawn of civilization.

Figure 1: Confederation of Indigenous nations of the Middle East and North Africa (CINMENA banner)

From the Jews of Morocco and the many Amazigh (formerly 'Berber') tribes of North Africa to the dispersed communities of the ancient Zoroastrian nation, from Bedouins of the desert to the Ma'dān or Marsh Arabs of Mesopotamia, they are the modern-day representatives of nations seemingly as old as the desert sands. Their communities often face harsh discrimination from corrupt and despotic states' governments that deny them the full benefits of citizenship and even their very identity as ancient nations.

Indigenous nations — particularly in unstable regions such as the Middle East — have been deliberately deprived of their human rights and fundamental freedoms, resulting in the dispossession of their territories, lands, and resources. They are obstructed from freely exercising their right to development according to their needs and interests. But thanks to the recent widespread introduction of cell phones and the Internet, even poor, remote communities are now capable of networking to empower themselves to escape the vicious cycle and enter the modern era on their terms.

Every nation possesses the inherent right to determine their political status. But that right is not realized without a struggle, as nations have learned to their regret for centuries. Instead, autonomous nationhood is something that Indigenous peoples must consciously choose and actively struggle to transform into a social, legal, and political reality.

For every Nation—a Place under the Sun

What does it take to bind together such a disparate collection of nations when each has distinct traditions, and each is distrustful of outsiders? Their common aim is to level the playing field. Each nation can assert its right to determine its own political identity and fulfill its destiny according to its customary laws.

The Islamic State's (ISIS or ISIL)[1] bloody 2014 onslaught targeting Yezidis[2] set the stage for change. Thanks in no small part to ISIS extremists' genocidal rampage, Ezidikhan and other Indigenous nations of the Middle East and North Africa are now organizing themselves to end all forms of discrimination and oppression wherever they occur and to provide for a common defense. Intent on destroying the Yezidi nation of Ezidikhan,[3] they have instead helped to raise

[1] The Islamic State of Iraq and Syria, known as ISIL (Islamic State of Iraq and the Levant), is a Sunni Muslim revivalist and fundamentalist movement devoted to practicing Wahhabism, a reformist 18th century doctrine advanced by Arabian Islamic scholar, theologian, preacher, and activist Muhammad Ibn Abd al-Wahhab (c. 1703-1792). Al-Wahhab formed the Muwahhidun movement in the Najd region of central Arabia—now Saudi Arabia. The movement he promoted emphasizes purging practices such as veneration of Muslim saints and pilgrimages to their tombs. Al-Wahhab was inspired by the thirteenth century scholar Ibn Taymiyyah (1262-1328) who advocated followers returning to the "purity" of the first three generations (Salaf) to expunge the faith of so-called inauthentic behaviors.

[2] Taylor, L. (2017). "Nearly 10,000 Yazidis killed, kidnapped by Islamic State in 2014, study finds." Reuters May 9, 2017. https://www.reuters.com/article/us-mideast-crisis-iraq-yazidis-idUSKBN18527I ISIS forces entered the major Ezidikhan city of Shingal (Sinjar in Arabic) (formerly 80,000 people) to destroy a people whose name "Yezidi" was misinterpreted to mean "of the devil." In reality "Yezidi" means followers of the Peacock, "followers of god."

[3] Ezidikhan means: "land of the Yezidi."

the once little-known Yezidis from obscurity to a leadership role in the West Asia[4] and globally.

Yezidi Role

The Yezidi is an ancient nation long settled in the upper Fertile Crescent with territories extending far to the north, with roots extending deep into antiquity. They maintain a calendar to this day that that records more than 6600 years of Yezidi history. According to Yezidi tradition, the neighboring Kurds[5] were once Yezidis who fell from their ancestral faith and converted to Islam at the point of a sword.

Yezidi religious practices draw heavily from Mesopotamian cosmology.[6] They are characterized by the worship of an "archangel" figure called Melek Ta'us; the 'Peacock Angel' created in the beginning by God and entrusted as His Regent or Viceroy on Earth.

On August 3rd, 2014, Yezidi activist Nallein Sowilo was en route to her native Shingal (Arabic: Sinjar) in northern Iraq. Kurdish Peshmerga forces[7] that occupied Shingal under the pretense of defending Shingal were secretly preparing to evacuate that very night as ISIS forces entered Shingal. The Peshmerga had advance knowledge of what would be the mass genocide that was to be unleashed by ISIS on the peaceful Yezidi population of Shingal.

Ms. Sowilo's flight was diverted to Istanbul. She had no option but to turn back—and yet she vowed that she would never again turn back in her mission of justice with peace and dignity for her Yezidi nation.

Figure 2: At right, Ezidikhan Justice Minister Nallein Sowilo attending a friend's wedding in Ezidikhan in 2021

[4] West Asia includes Anatolia, the Arabian Peninsula, Iran, Mesopotamia, the Levant, the island of Cyprus, the Sinai Peninsula and part of the Caucasus. Yezidi people are primarily located in what is now northern Iraq between the Tigris and Euphrates rivers (known is ancient scripts as Mesopotamia), but communities of Yezidi are also located historically in northern Syria, western Turkey, Armenia, Georgia, and diaspora in Russia and western Europe.

[5] The term "Kurd" appears to have been introduced by Arabs in the 8th or 9th century with the meaning of "nomads" though Islam is suggested to have become accepted by tribes labeled "kurdish" in the 8th century. SEE: Martin van Bruinessen, "The Kurds and Islam". Working Paper no. 13, Islamic Area Studies Project, Tokyo, Japan, 1999. [this is a slightly revised version of the article in Islam des Kurdes (Les Annales de l'Autre Islam, No.5). Paris: INALCO, 1998, pp. 13-35]

[6] Religious in Mesopotamia four thousand years ago was exceptionally localized and politicized. Each community had its own patron deity. The role of the deity was negotiated between the communities depending on the status of the community. Religion wasn't a matter of the existence of gods or representatives of a god with their own place in the social order. See: https://brewminate.com/ancient-mesopotamian-cosmology-and-mythology/

[7] *Peshmerga* (those who face death) serve as the Kurdish branch of the Iraqi Armed Forces acting at the direction of the autonomous Kurdistan Regional government. The Peshmerga were originally formed in the 18th century when the Ottomans controlled the Kurdish territories.

Fluent in her native Kurmanji and Arabic but with limited English, Nallein realized the need for non-Yezidi volunteers who could help Ezidikhan achieve internationally recognized autonomy. However, she had few resources and no one she could rely on but herself. With nothing more than a cell phone, she began reaching out to Yezidis and others worldwide, to anyone who might help.

As for Indigenous nations around the world, Yezidi traditions encapsulate arcane knowledge that stubbornly resists reduction into words or books, such as the interpretation of signs, omens, or portents. The same knowledge that Yezidis and other Indigenous nations preserve sustains them as peoples and nations.

Drawing upon Yezidi oral traditions, Nallein had long been drawn to a figure in the Hindu pantheon called Skanda or Murugan, exhibiting uncanny parallels with the Yezidis' own Peacock Angel Melek Ta'us. Although far removed geographically, the two figures nevertheless neatly align in a suite of core characteristics that outsiders (including eminent scholars) consider mere coincidences, including notably their mutual association with India's national bird, the peacock.

It was at this point that I entered the picture. Within a month of the first attack by ISIS in 2014, Ms. Sowilo reached out to me, a Florida-based Indologist,[8] editor and publisher who had already long been advocating on behalf of Indigenous peoples of Sri Lanka. And thus began a synergistic partnership that continues to this day, not as a mere relief effort or band-aid but with the single-pointed objective of achieving political autonomy for Ezidikhan along with lasting peace and justice for Yezidis.

Baba Sheikh

Soon after that, in October 2014, the Islamic State launched its second major assault intended to finish off the Yezidi nation. The late supreme spiritual leader of the Yezidis, the Baba Sheikh, Khurto Hajji Ismail himself, hastened to Washington DC to plead for any help from the State Department and the White House. The aged pontiff had also forwarded a curious request to meet me and visit a temple dedicated to Skanda-Murugan. That meeting occurred at seven pm on 29 October 2014 at the Murugan Temple of North America in nearby Lanham, MD, and just happened to coincide with the ritual reenactment of the pan-Indian war god's climactic final battle in his six-day war against a powerful demon named Cūr, literally 'fear' or 'terror' personified.

The Baba Sheikh, Khurto Hajji Ismail, had recently appointed Nallein to oversee the creation of a provisional government of Ezidikhan with a solid legal foundation so Yezidis might achieve international recognition and autonomous self-government within the Iraqi constitution.

If the August 2014 cataclysm that befell the Yezidis at the hands of Daesh had any positive outcome at all, it has been in the sense of a newfound sense of community and a common cause shared by Indigenous nations across the entire Middle East, North Africa and beyond.

[8] The study of the history, cultures, languages and literature of South Asia – the Indian continent.

And not just a sense of solidarity, but a growing political movement by a growing bloc of Indigenous nations, tribes, and confederations of tribes representing a rainbow of beliefs and traditional knowledge — where all share a set of common interests and aspirations.

Indigenous nations of the Middle East and North Africa, like their counterparts worldwide, struggle with social, political, intolerance and economic bigotry. While this pattern has left them politically and economically weak, it also provides Indigenous nations with a set of shared concerns and a shared basis for collaboration.

Center for World Indigenous Studies and Ezidikhan

Nallein's appeals to diplomats and prominent public figures continued to fall upon deaf ears despite her best efforts. Funds could not be found even for modest relief efforts, let alone run a shadow government for an autonomous Ezidikhan. Little diplomatic or political progress was made since she lacked expert advisors or fund.

Figure 3: Prime Minister Barjis Soso Khalaf meeting with Indian Ambassador Dr. Pradeep Singh Rajpurohit in Baghdad

The Kurdish Regional Government's military renewed occupation of Ezidikhan, and the Iraqi government's intransigence combined to frustrate the Yezidi plans for a plebiscite to formalize their government. Moreover, on 9 October 2021, an agreement was negotiated between Baghdad and the Kurd's government in Erbil to separately determine the political future of Yezidis without seeking the Yezidi's consent and without consulting Yezidi representatives of the Ezidikhan Provisional Government. In the words of Ezidikhan Prime Minister, Barjis Soso Khalaf, the deal "tramples upon the right of Yezidis to govern themselves as they see fit."

Autonomy

The International Covenant on the Rights of Indigenous Nations (ICRIN), first ratified in Geneva, Switzerland, on 28 July 1994, is a comprehensive international agreement between signatory nations to address the rights and long-term social, economic, and political interests of indigenous nations.

> Under Article I, Paragraph 3 the Covenant states:
>
> Indigenous Nations have the right of self-determination, in accordance with international law, and by virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development without external interference.

The Covenant further states Article II, Part II, para 5.: "Each Indigenous Nation possesses the collective right to exist in peace and security

as a distinct people and to be protected against any type of genocide," a matter of relevance to Ezidikhan considering the attacks by ISIS in 2014 and other attacks from Turkey, the Kurds and Iraq since 2014.

The immediate objective of Ezidikhan — and of most all Indigenous nations — is to bring about the conditions for their unhindered self-governing—a condition of political autonomy with self-governing institutions conforming to their customary laws as affirmed in the Covenant at paragraph 29.

> Indigenous Nations have the right to freely determine their own political status and to exercise self-government in accord with the principle of self-determination.

Genocide Investigation

In 2018, Ezidikhan's provisional government passed a law establishing an Ezidikhan Investigative Team on Genocide headed by a Senior Investigator. The Investigative Team was given a mandate to "independently undertake to investigate, collect, document, store and preserve evidence pertaining to crimes of genocide and crimes against humanity perpetrated against Yezidi and neighboring nations." It was the first such genocide investigative team created by an indigenous nation.

The Senior Investigator of the Ezidikhan Investigative Team on Genocide was empowered to recruit and appoint experienced investigators and prosecutors from the Yezidi, Mandaean, Zoroastrian, Shia Kurd, Kuwliyan, and Shabakh nations to conduct the investigations.

The new investigative team was also authorized to probe all crimes and identify suspects, whether persons, groups, or institutions that may have committed genocide, including but not limited to Da'esh and its allies. In addition, the Ezidikhan team was to investigate crimes attributable to Iraqi government forces, at the federal or regional level, including militias such as the Popular Mobilization Forces or international forces.

The Investigative Team on Genocide set itself to work. It began to uncover evidence supporting allegations of collusion between ISIS and Kurdish security elements, depicting a pattern of genocidal policies of the Kurdish Regional Government. The Senior Investigator, Mohmand Raja, was so feared by the subjects of his team's investigations that he ultimately paid with his life when he was assassinated outside his home by unknown assailants, effectively abruptly halting investigative efforts. Suspects of the murder include the Kurdish Regional Government colluding with organized criminal gangs involved in money laundering, human trafficking and the smuggling of illegal drugs and weapons. The Investigative Team on Genocide was within two weeks recommitted to document crimes against the Yezidi and neighboring peoples under a new leader who had been second in command. The Team continued its investigations and filing reports for several more months but was forced to stop when the second Senior Investigator was also assassinated. The records of the Investigative Team are secured, and the Ezidikhan Governing Council intends to use the documentation produced over two years by the brave team for the

purpose of lodging criminal charges of genocide and crimes against humanity against identified individuals, militias, and governments.

Kurdish-ISIS Collusion?

That ISIS committed massive atrocities against Yezidis from 3 August 2014 onwards is well-known and well-documented. Less well-known, however, is the despicable role of Kurdish Peshmerga forces that had been tasked with defending Shingal's defenseless civilian population.

A 2019 report of the Ezidikhan Investigative Team specifically singled out the Kurdish Peshmerga and the Asayish, the Kurdish secret police, as agents executing the genocidal policies of the Kurdistan Regional Government that rob Yezidis of justice, self-determination, natural resources, including petroleum, and even the cultural, linguistic, and religious identity of Yezidis.

Ms. Sowilo and other Yezidi survivors allege that before ISIS began its attack on Shingal and neighboring villages, the Iraqi Kurdish Peshmerga forces stationed in Shingal quietly withdrew at night, leaving Yezidi civilians to wake up and find ISIS fighters at their doorsteps. Eight years later, the memory of the 2014 'knife in the back' from Kurdish Peshmerga continues to haunt the politics of northern Iraq. Ezidikhan investigators' report concluded that:

> Both governments have employed the resources of the state to attack, criminalize, and target individuals and entire communities. These government resources include the Kurdish Peshmerga, and the Essayish, the Kurdish secret police. They have chosen to make state sponsored terrorism, human sex trafficking, murder, and rape the normal governmental response to demands for equity and equality of human rights, land rights, control over natural resources, and the establishment of an autonomous Yezidi region governed by the Yezidi people. All of which we allege were funded by profits from oil fields placed on seized Yezidi lands; and all of which was supported by President Barzani.

Ezidikhan government investigators had also uncovered video footage of Kurdish troops meeting with ISIS forces outside of Shingal on the morning of August 3, 2014. Kurdish troops are said to have helped ISIS carry out genocide against Yezidis by coming and taking weapons and boarding up some of the houses of particularly identified religious leaders on the day before the attack. Kurdish forces then quietly withdrew from Shingal but located tanks blocking the city's main escape routes and fired upon any Yezidi who attempted to leave the city.

Middle East Confederation

The Confederation of Indigenous Nations of the Middle East and North Africa consists of confederated nations, tribes, and other entities, including governments in exile and advocating bodies. These nations have adopted a joint legal approach to deal with a wide range of concerns and challenges common to Indigenous minorities, including security and international legal and diplomatic recognition. All 66 CINMENA nations

have ratified the International Covenant on the Rights of Indigenous Nations (ICRIN) as a precondition for membership.

Although the International Covenant on the Rights of Indigenous Nations (ICRIN) was first ratified in 1994 until recently, not a single Indigenous nation in the entire Middle East region had ratified (or even heard of) it due to a long history of isolation, conflict, and division. CINMENA came into being as a direct result of untiring efforts by Justice Minister Sowilo to achieve international legal recognition for Ezidikhan, first through ratification by Iraqi Ezidikhan and then by Yezidi communities of the region.

Figure 4: The logo of the Confederation of Indigenous Nations of the Middle East and North Africa reflects their diverse heritages.

Justice Minister Sowilo had long been in regular contact with representatives of other oppressed minorities across the entire Middle East. After learning from her about the International Covenant on the Rights of Indigenous Nations and how its ratification reinforces signatory nations' push towards full legal autonomy, the nations and tribes came forward to request the Ezidikhan Justice Ministry's assistance so they too could draft and ratify ICRIN

By mid-2020, sixteen nations of the region had ratified the Covenant document, including all six branches of the Yezidi nation Ezidikhan and such nations as the Zoroastrians and Mandaeans in Iraq and Iran, Palestinian Bedouins, Ahwaz in Iran, Berber Tribes in Libya, and Shabaks in Iraq. Those nations who were able sent their delegates to Shingal, Ezidikhan, where on 21 August 2020 the Shingal Treaty of 2020 was signed.

Figure 5: August 2020: Leaders of oppressed minorities headed by the Baba Sheikh (at center) meet in Shingal.

Thanks to Justice Minister Sowilo's untiring efforts, since then, an almost constant stream of Indigenous tribes, nations, and smaller confederations have sought to join the Confederation. Her Ministry even set up a board of volunteer editors and legal experts to assist in drafting and editing documents of ratification of the Covenant tailored to fit the background and concerns of each applicant tribe or nation.

The remarkable diversity of the Confederation's sixty-six member nations, and the commonality of their national interests ensure cooperation as a bloc of nations. Without exception, every member nation faces variations of the same set of core issues: Their suppression as minorities by the state's legal apparatus; social and economic discrimination; denial of legitimacy, and even their very identity by states that seek to exercise rule over their people.

Consequently, despite their obvious dissimilarities and differences, CINMENA member nations find ample grounds for a common cause, best reflected in the 2022 unanimous agreement of member nations to delegate to chief negotiator Nallein Sowilo their proxy votes in international negotiations in recognition of Sowilo's understanding of each member nation's position on a wide range of sensitive issues. Ms. Sowilo's elevation from obscurity also reflects widespread respect and sympathy for her as the foremost exponent of autonomy for Ezidikhan and other Indigenous nations of the Middle East.

Nations' International Criminal Tribunal

Of particular importance and interest to Ezidikhan and other nations affected by turmoil in the Middle East is the establishment of an International Criminal Tribunal to prosecute and hold accountable those who commit criminal acts of genocide. A Tribunal can investigate, document, indict, and prosecute individuals and entities responsible for initiating genocidal acts and policies directed against Yezidis and other nations.

For nearly six years, steps have been underway following the attacks by ISIS to lay the groundwork for the Nations' International Criminal Tribunal. Ezidikhan's Justice Minister Sowilo represents here government and leads the Confederation of Indigenous Nations of the Middle East and North Africa to establish this new international institution. No international tribunal exists that has the jurisdiction to prosecute crimes against indigenous nations. The International Criminal Court (ICC), the International Court of Justice (ICJ), and the United Nations cannot exercise jurisdiction over the subject of crimes against Indigenous nations. The hopes and aspirations of Indigenous peoples spanning the entirety of the Middle East and North Africa worldwide are with Justice Minister Sowilo.

No one has expressed their hopes better than Dr. Khalil al-Dulaimi, founder and head of the Al-Dulaimi Tribal Confederation of Iraq, who recently said:

> عندما اتصلت نالين بنا من أجل المحكمة ، اعتقدنا أن الفكرة كانت وقتًا مثاليًا وحدة العراق كجزء من المحكمة. نشعر أن القبائل ستعامل باحترام استقلالية شعبنا هي هدف يعود تاريخه إلى ألف عام ، ورؤية هذا الحلم يتحقق في وقتي المباشر هو شيء لم أفكر أبدًا أو الدليمي في أننا سنراه يحدث." —خليل الدليمي

When Nallein called us about a Justice Tribunal, we thought the idea came at the ideal time to unite Iraq under the Tribunal. For our people's tribal autonomy to be treated with respect is a goal that dates back a thousand years. Seeing this dream come

true in my lifetime is something that I and the Dulaimi tribal nation never thought we would see happen.

As always, many uncertainties surround an effort with a scope as vast and complicated as that of the Congress of Nations and States, even with decades of preparation. Even in the best of times, such an undertaking involving collaboration across multiple linguistic, religious, and political boundaries would face daunting challenges, including sponsorship. In 2022, with a war raging on the European continent, the crisis of Climate Change, COVID-19 restrictions, and a host of related crises including spiraling costs of fuel and food staples, the stakes and the challenges could not be higher.

"Our creation story speaks of Melek Taus coming down upon Mount Shingal and planting a wheat seed," says Justice Minister Sowilo. "And that seed grew into all that is life, creating the universe as it grew. Our stories view it as the site of the beginning of life. That is why Shingal is such a holy mountain for the Yezidi."

Therefore, it is fitting and proper that Shingal, the capital city of Ezidikhan, which only recently endured unspeakable atrocities at the hands of intolerant ISIS extremists, is also the birthplace of the Middle East's first-ever Confederation of Indigenous nations.

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Ezidikhan se Levanta del Genocidio:
66 Naciones Indígenas Establecen la Confederación de Medio Oriente/África del Norte

Por Patrick Harrigan
Traducción al Español por Aline Castañeda Cadena

RESUMEN

Durante más de 6000 años, los yezidis han celebrado su lugar en la fértil región entre los ríos Tigris y Éufrates en Mesopotamia. Ahora están situados en los estados de Siria, Irak, Turquía, Armenia e Irán. Desde la formación del Imperio Otomano (1300-1922), que se estableció originalmente en Anatolia, la ubicación de la Turquía contemporánea, los yezidis han sufrido innumerables crisis que amenazan sus vidas y propiedades, incluidos numerosos genocidios.

El gobierno yezidi de Ezidikhan lidera el esfuerzo para formar la primera Confederación de Naciones Indígenas de varias regiones que forma la Confederación de Naciones Indígenas del Medio Oriente y África del Norte (CINMENA). Habiendo sufrido ataques genocidas masivos, la ministra de Justicia yezidi, Nallein Sowilo describe que enfrentó los ataques contra su pueblo por parte del Estado Islámico en 2014, estableció la Confederación e inició el esfuerzo para establecer el Tribunal Penal Internacional de las Naciones.

Palabras clave: Mesopotamia, genocidio, Gobierno Regional Kurdo, Irak, Confederación, Tribunal

Con poca fanfarria, muchas naciones indígenas y organizaciones comunitarias que abarcan todo el Medio Oriente y el norte de África han dejado de lado la sospecha y la desconfianza mutua para formar el primer bloque de naciones indígenas de esta vasta región. Si bien estas naciones o comunidades difieren enormemente, comparten un deseo genuino de gobernarse a sí mismas y decidir sus destinos libres de interferencias externas.

Figura 1: Cartel de la Confederación de naciones indígenas de Medio Oriente y África del Norte (CINMENA)

El origen de la Confederación de Naciones Indígenas de Medio Oriente y África del Norte (CINMENA) se remonta al asalto de 2014 por parte de extremistas de ISIS contra la nación yazidí de Ezidikhan en el norte de Irak. Aún así, sus raíces se remontan a los albores de la civilización.

Desde los judíos de Marruecos y las muchas tribus amazigh (anteriormente 'bereberes') del norte de África hasta las comunidades dispersas de la antigua nación zoroastriana, desde los beduinos del desierto hasta los ma'dān o árabes de las marismas de Mesopotamia, son los representantes modernos de naciones aparentemente tan antiguas como las arenas del desierto. Sus comunidades a menudo se enfrentan a una dura discriminación por parte de gobiernos de estados corruptos y despóticos que les niegan todos los beneficios de la ciudadanía e incluso su propia identidad como naciones antiguas.

Las naciones indígenas, particularmente en regiones inestables como el Medio Oriente, han sido privadas deliberadamente de sus derechos humanos y libertades fundamentales, lo que ha resultado en el despojo de sus territorios, tierras y recursos. Se les impide ejercer libremente su derecho al desarrollo de acuerdo con sus necesidades e intereses. Pero gracias a la reciente introducción generalizada de teléfonos celulares e Internet, incluso las comunidades pobres y remotas ahora pueden conectarse en red para empoderarse para escapar del círculo vicioso e ingresar a la era moderna en sus términos.

Cada nación posee el derecho inherente de determinar su estatus político. Pero ese derecho no se realiza sin lucha, como las naciones han aprendido a su pesar durante siglos. En cambio, la nacionalidad autónoma es algo que los pueblos indígenas deben elegir conscientemente y luchar activamente para transformarlo en una realidad social, legal y política.

Para cada nación: un lugar bajo el sol

¿Qué se necesita para unir una colección tan dispar de naciones cuando cada una tiene tradiciones distintas y cada una desconfía de los extraños? Su objetivo común es nivelar el campo de juego. Cada nación puede hacer valer su derecho a determinar su propia identidad política y cumplir su destino de acuerdo con sus leyes consuetudinarias.

El sangriento ataque del Estado Islámico (ISIS o ISIL)[1] en 2014 contra los yazidíes[2] preparó el escenario para el cambio. Gracias en gran parte al alboroto genocida de los extremistas de ISIS, Ezidikhan y otras naciones indígenas de

[1] El Estado Islámico de Irak y Siria, conocido como ISIL (Estado Islámico de Irak y el Levante), es un movimiento renacentista y fundamentalista musulmán sunita dedicado a practicar el wahabismo, una doctrina reformista del siglo XVIII propuesta por el erudito, teólogo, predicador y líder islámico árabe y activista Muhammad Ibn Abd al-Wahhab (c. 1703-1792). Al-Wahhab formó el movimiento Muwahhidun en la región Najd de Arabia central, ahora Arabia Saudita. El movimiento que promovió enfatiza prácticas de purga como la veneración de los santos musulmanes y las peregrinaciones a sus tumbas. Al-Wahhab se inspiró en el erudito del siglo XIII Ibn Taymiyyah (1262-1328), quien abogó por que los seguidores volvieran a la "pureza" de las primeras tres generaciones (Salaf) para eliminar la fe de los llamados comportamientos no auténticos.

[2] Taylor, L. (2017). "Cerca de 10.000 yezidis asesinados, secuestrados por el Estado Islámico en 2014, según un estudio". Reuters 9 de mayo de 2017. https://www.reuters.com/article/us-mideast-crisis-iraq-yezidis-idUSKBN18527I Las fuerzas de ISIS entraron en la principal ciudad de Ezidikhan de Shingal (Sinjar en árabe) (anteriormente 80.000 personas) para destruir un pueblo cuyo nombre "Yezidi" fue malinterpretado como "del diablo". En realidad, "Yezidi" significa seguidores del pavo real, "seguidores de dios".

Medio Oriente y África del Norte ahora se están organizando para poner fin a todas las formas de discriminación y opresión dondequiera que ocurran y para proporcionar una defensa común. Con la intención de destruir la nación yezidi de Ezidikhan[3], en cambio, han ayudado a elevar a los yazidíes, que alguna vez fueron poco conocidos, de la oscuridad a un papel de liderazgo en el oeste de Asia[4] y en todo el mundo.

El papel de los Yezidi

Los yezidis son una antigua nación asentada desde hace mucho tiempo en la parte superior de la Media Luna Fértil con territorios que se extienden hacia el norte, con raíces que se extienden hasta la antigüedad. Mantienen un calendario hasta el día de hoy que registra más de 6600 años de historia yezidi. Según la tradición yezidi, los kurdos[5] vecinos fueron una vez yezids que cayeron de su fe ancestral y se convirtieron al Islam a punta de espada.

Las prácticas religiosas yezidi se basan en gran medida en la cosmología mesopotámica[6]. Se caracterizan por la adoración de una figura de "arcángel" llamada Melek Ta'us; el 'Ángel Pavo Real' creado en el principio por Dios y encomendado como Su Regente o Virrey en la Tierra.

El 3 de agosto de 2014, la activista yezid Nallein Sowilo se dirigía a su natal Shingal (árabe: Sinjar) en el norte de Irak. Las fuerzas peshmerga[7] kurdas que ocuparon Shingal con el pretexto de defender Shingal se estaban preparando en secreto para evacuar esa misma noche cuando las fuerzas de ISIS entraron en Shingal. Los Peshmerga tenían conocimiento previo de lo que sería el genocidio masivo que ISIS iba a desatar sobre la población pacífica yezidi de Shingal.

El vuelo de la Sra. Sowilo fue desviado a Estambul. No tuvo más opción que dar marcha atrás y, sin embargo, prometió que nunca más daría marcha atrás en su misión de justicia con paz y dignidad para su nación yezidi.

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[3] Ezidikhan significa: "la tierra de los yezidis"

[4] Asia Occidental incluye Anatolia, la Península Arábiga, Irán, Mesopotamia, el Levante, la isla de Chipre, la Península del Sinaí y parte del Cáucaso. El pueblo yezidi se encuentra principalmente en lo que ahora es el norte de Irak, entre los ríos Tigris y Éufrates (conocido en escrituras antiguas como Mesopotamia), pero las comunidades de yezidis también se encuentran históricamente en el norte de Siria, el oeste de Turquía, Armenia, Georgia y la diáspora en Rusia y Europa Oriental

[5] El término "kurdo" parece haber sido introducido por los árabes en el siglo VIII o IX con el significado de "nómadas", aunque se sugiere que el Islam fue aceptado por tribus etiquetadas como "kurdas" en el siglo VIII. Ver: Martin van Bruinessen, "Los kurdos y el Islam". Documento de trabajo núm. 13, Proyecto de Estudios del Área Islámica, Tokio, Japón, 1999. [Esta es una versión ligeramente revisada del artículo en Islam des Kurdes (Les Annales de l'Autre Islam, No.5). París: INALCO, 1998, pp. 13-35]

[6] La religión en Mesopotamia hace cuatro mil años estaba excepcionalmente localizada y politizada. Cada comunidad tenía su propia deidad patrona. El papel de la deidad se negoció entre las comunidades según el estado de la comunidad. La religión no era cuestión de la existencia de dioses o representantes de un dios con su propio lugar en el orden social. Ver: https://brewminate.com/ancient-mesopotamian-cosmology-and-mythology/

[7] *Peshmerga* (aquellos que enfrentan la muerte) sirven como la rama kurda de las Fuerzas Armadas iraquíes que actúan bajo la dirección del gobierno regional autónomo de Kurdistán. Los Peshmerga se formaron originalmente en el siglo XVIII cuando los otomanos controlaban los territorios kurdos.

FigurA 2: A la derecha, la Ministro de Justicia de Ezidikhan Nallein Sowilo asiste a la boda de una amiga en Ezidikhan en 2021

Con fluidez en su lengua materna, kurmanji y árabe, pero con un inglés limitado, Nallein se dio cuenta de la necesidad de voluntarios no yezidis que pudieran ayudar a Ezidikhan a lograr una autonomía reconocida internacionalmente. Sin embargo, tenía pocos recursos y no podía confiar en nadie más que en sí misma. Con nada más que un teléfono celular, comenzó a comunicarse con yezidis y otros en todo el mundo, con cualquiera que pudiera ayudar.

En cuanto a las naciones indígenas de todo el mundo, las tradiciones yezidi encapsulan conocimientos arcanos que se resisten obstinadamente a reducirse a palabras o libros, como la interpretación de señales o presagios. El mismo conocimiento que conservan los yezidis y otras naciones indígenas los sustenta como pueblos y naciones.

Inspirándose en las tradiciones orales de los yezidis, Nallein se había sentido atraída durante mucho tiempo por una figura del panteón hindú llamada Skanda o Murugan, que mostraba extraños paralelismos con el propio ángel pavo real Melek Ta'us de los yezidis. Aunque están muy alejadas geográficamente, las dos figuras se alinean claramente en un conjunto de características centrales que los forasteros (incluidos los académicos eminentes) consideran meras coincidencias, incluida en particular su asociación mutua con el ave nacional de la India, el pavo real.

Fue en este punto que entré en escena. Un mes después del primer ataque de ISIS en 2014, la Sra. Sowilo se acercó a mí, un indólogo[8], editor con sede en Florida que ya llevaba mucho tiempo abogando en nombre de los pueblos indígenas de Sri Lanka. Y así comenzó una asociación sinérgica que continúa hasta el día de hoy, no como un mero esfuerzo de socorro o curita, sino con el objetivo único de lograr la autonomía política para Ezidikhan junto con una paz y justicia duraderas para los yezidis.

Baba Sheikh

Poco después, en octubre de 2014, el Estado Islámico lanzó su segundo gran ataque con la intención de acabar con la nación yezidi. El difunto líder espiritual supremo de los Yezidis, el Baba Sheikh, el propio Khurto Hajji Ismail, se apresuró a ir a Washington DC para pedir ayuda al Departamento de Estado y la Casa Blanca. El anciano pontífice también me envió una curiosa solicitud para encontrarme y visitar un templo dedicado a Skanda-Murugan. Esa reunión tuvo lugar a las siete de la tarde del 29 de octubre de

[8] El estudio de la historia, las culturas, los idiomas y la literatura del sur de Asia: el continente indio.

2014 en el Templo Murugan de América del Norte en las cercanías de Lanham, Maryland, y coincidió con la recreación ritual de la culminante batalla final del dios panindio de la guerra en su guerra de seis días contra un poderoso demonio llamado Cūr, literalmente 'miedo' o 'terror' personificado.

El Baba Sheikh, Khurto Hajji Ismail, había designado recientemente a Nallein para supervisar la creación de un gobierno provisional de Ezidikhan con una base legal sólida para que los yezidis pudieran lograr el reconocimiento internacional y el autogobierno autónomo dentro de la constitución iraquí.

Si el cataclismo de agosto de 2014 que cayó sobre los yezidis a manos de Daesh tuvo algún resultado positivo, ha sido en un nuevo sentido de comunidad y una causa común compartida por las naciones indígenas en todo el Medio Oriente, África del Norte y más allá. Y no solo un sentido de solidaridad, sino un movimiento político creciente de un bloque creciente de naciones indígenas, tribus y confederaciones de tribus que representan un arcoiris de creencias y conocimientos tradicionales, donde todos comparten un conjunto de intereses y aspiraciones comunes.

Las naciones indígenas de Medio Oriente y África del Norte, al igual que sus contrapartes en todo el mundo, luchan contra la intolerancia social, política y económica. Si bien este patrón los ha dejado política y económicamente débiles, también proporciona a las naciones indígenas un conjunto de preocupaciones compartidas y una base compartida para la colaboración.

El Centro de Estudios Indígenas del Mundo y Ezidikhan

Los llamamientos de Nallein a diplomáticos y figuras públicas prominentes continuaron cayendo en oídos sordos a pesar de sus mejores esfuerzos. No se pudieron encontrar fondos ni siquiera para modestos esfuerzos de ayuda, y mucho menos para ejecutar un gobierno en la sombra para un Ezidikhan autónomo. Se hicieron pocos avances diplomáticos o políticos, ya que carecía de fondos y de asesores expertos.

Figura 3: Primer Ministro Barjis Soso Khalaf en reunion con el Embajador Indi Dr. Pradeep Singh Rajpurohit en Baghdad

Todo eso cambió en 2016. Nallein se puso en contacto con el Centro de Estudios Indígenas Mundiales (CWIS) en la persona de su fundador, el Dr. Rudolph Rÿser, quien reconoció de inmediato el alcance y las implicaciones de su solicitud de "servicios de consulta". Con los recursos del CWIS a nuestra disposición y bajo la dirección de Rÿser, nuestros esfuerzos se volvieron más enfocados y cohesivos. Juntos, Nallein y el Dr. Rÿser redactaron una

proclamación para establecer un nuevo gobierno de Ezidikhan. El Consejo Espiritual Supremo encabezado por Baba Sheikh, proclamó el Gobierno Provisional de Ezidikhan. En el verano de 2017, se autorizó al gobierno de Ezidikhan a constituirse bajo una constitución formal. Desde entonces, Nallein ha ocupado el puesto de Ministro de Justicia de Ezidikhan en el Consejo de Gobierno de 12 miembros ahora dirigido por el Primer Ministro Barjis Saso Khalaf.

La renovada ocupación militar de Ezidikhan por parte del gobierno regional kurdo y la intransigencia del gobierno iraquí se combinaron para frustrar los planes yezidis de un plebiscito para formalizar su gobierno. Además, el 9 de octubre de 2021, se negoció un acuerdo entre Bagdad y el gobierno kurdo en Erbil para determinar por separado el futuro político de los yezidis sin buscar el consentimiento de los mismos y sin consultar a los representantes del Gobierno Provisional de Ezidikhan. En palabras del primer ministro de Ezidikhan, Barjis Soso Khalaf, el acuerdo "pisotea el derecho de los yezidis a gobernarse a sí mismos como mejor les parezca".

Autonomía

El Pacto Internacional sobre los Derechos de las Naciones Indígenas (ICRIN), ratificado por primera vez en Ginebra, Suiza, el 28 de julio de 1994, es un acuerdo internacional integral entre las naciones signatarias para abordar los derechos y los intereses sociales, económicos y políticos a largo plazo de los pueblos indígenas. naciones

En virtud del artículo I, párrafo 3, el Pacto establece:

> Las Naciones Indígenas tienen derecho a la libre determinación, de conformidad con el derecho internacional, y en virtud de ese derecho determinan libremente su condición política y persiguen libremente su desarrollo económico, social y cultural sin injerencias externas.

El Pacto establece además el Artículo II, Parte II, párrafo 5.: "Cada Nación Indígena posee el derecho colectivo a existir en paz y seguridad como un pueblo distinto y a ser protegido contra cualquier tipo de genocidio", un asunto de relevancia para Ezidikhan considerando los ataques de ISIS en 2014 y otros ataques de Turquía, los kurdos e Irak desde 2014.

El objetivo inmediato de Ezidikhan, y de la mayoría de las naciones indígenas, es lograr las condiciones para su autogobierno sin trabas, una condición de autonomía política con instituciones de autogobierno conforme a sus leyes consuetudinarias, como se afirma en el Pacto en el párrafo 29.

Las Naciones Indígenas tienen derecho a determinar libremente su propio estatus político y a ejercer el autogobierno de acuerdo con el principio de libre determinación.

Investigación de Genocidio

En 2018, el gobierno provisional de Ezidikhan aprobó una ley que establece un Equipo de Investigación de Ezidikhan sobre Genocidio

encabezado por un Investigador Principal. El Equipo de Investigación recibió el mandato de "comprometerse de forma independiente para investigar, recopilar, documentar, almacenar y preservar evidencia relacionada con crímenes de genocidio y crímenes de lesa humanidad perpetrados contra los yezidis y las naciones vecinas". Fue el primer equipo de investigación de genocidio creado por una nación indígena.

El Investigador Principal del Equipo de Investigación de Genocidio de Ezidikhan estaba facultado para reclutar y nombrar investigadores y fiscales experimentados de las naciones yezidi, mandaeanoa, zoroastrianos, kurdo chiita, kuwliyan y shabakh para llevar a cabo las investigaciones.

El nuevo equipo de investigación también fue autorizado para investigar todos los delitos e identificar a los sospechosos, ya sean personas, grupos o instituciones que puedan haber cometido genocidio, incluidos, entre otros, Da'esh y sus aliados. Además, el equipo de Ezidikhan debía investigar delitos atribuibles a las fuerzas del gobierno iraquí, a nivel federal o regional, incluidas milicias como las Fuerzas de Movilización Popular o las fuerzas internacionales.

El Equipo de Investigación sobre Genocidio se puso a trabajar. Comenzó a descubrir pruebas que respaldaban las acusaciones de colusión entre ISIS y elementos de seguridad kurdos, lo que representa un patrón de políticas genocidas del gobierno regional kurdo. El investigador principal, Mohmand Raja, tenía tanto miedo por los temas de las investigaciones de su equipo que finalmente pagó con su vida cuando asaltantes desconocidos lo asesinaron fuera de su casa, lo que detuvo abruptamente los esfuerzos de investigación. Los sospechosos del asesinato incluyen al gobierno regional kurdo en connivencia con bandas criminales organizadas involucradas en el lavado de dinero, la trata de personas y el contrabando de drogas y armas ilegales. El Equipo de Investigación sobre Genocidio se comprometió nuevamente en dos semanas a documentar los crímenes contra los yezidis y los pueblos vecinos bajo un nuevo líder que había sido el segundo al mando. El Equipo continuó sus investigaciones y la presentación de informes durante varios meses más, pero se vio obligado a detenerse cuando el segundo investigador principal también fue asesinado. Los registros del Equipo de Investigación están protegidos, y el Consejo de Gobierno de Ezidikhan tiene la intención de utilizar la documentación producida durante dos años por el valiente equipo con el fin de presentar cargos penales de genocidio y crímenes de lesa humanidad contra personas, milicias y gobiernos identificados.

¿Colusión Kurdo-ISIS?

Que ISIS cometió atrocidades masivas contra Yezidis desde el 3 de agosto de 2014 en adelante es bien conocido y está bien documentado. Menos conocido, sin embargo, es el papel despreciable de las fuerzas peshmerga kurdas que tenían la tarea de defender a la población civil indefensa de Shingal.

Un informe de 2019 del Equipo de Investigación de Ezidikhan señaló específicamente a los kurdos Peshmerga y Asayish, la policía secreta kurda, como agentes

que ejecutan las políticas genocidas del Gobierno Regional del Kurdistán que roban a los yezidis la justicia, la autodeterminación, los recursos naturales, como el petróleo, e incluso la identidad cultural, lingüística y religiosa.

La Sra. Sowilo y otros sobrevivientes yezidis alegan que antes de que ISIS comenzara su ataque contra Shingal y las aldeas vecinas, las fuerzas peshmerga kurdas iraquíes estacionadas en Shingal se retiraron silenciosamente por la noche, dejando que los civiles yezidis se despertaran y encontraran combatientes de ISIS en sus puertas. Ocho años después, el recuerdo del 'cuchillo en la espalda' de los peshmerga kurdos de 2014 sigue rondando la política del norte de Irak. El informe de los investigadores de Ezidikhan concluyó que:

Ambos gobiernos han empleado los recursos del estado para atacar, criminalizar y seleccionar a individuos y comunidades enteras. Estos recursos del gobierno incluyen la Peshmerga kurda y la Essayish, la policía secreta kurda. Han optado por hacer del terrorismo patrocinado por el estado, el tráfico sexual de personas, el asesinato y la violación la respuesta gubernamental normal a las demandas de equidad e igualdad de derechos humanos, derechos territoriales, control sobre los recursos naturales y el establecimiento de una región autónoma Yezidi gobernada por el pueblo. Todo lo que alegamos fue financiado por las ganancias de los campos petroleros colocados en tierras yezidis incautadas; y todo lo cual fue apoyado por el presidente Barzani.

Los investigadores del gobierno de Ezidikhan también descubrieron imágenes de video de las tropas kurdas reunidas con las fuerzas de ISIS en las afueras de Shingal en la mañana del 3 de agosto de 2014. Se dice que las tropas kurdas ayudaron a ISIS a llevar a cabo el genocidio contra los yezidis al venir y tomar armas y abordar algunos de los líderes religiosos particularmente identificados el día anterior al ataque. Luego, las fuerzas kurdas se retiraron silenciosamente de Shingal, pero localizaron tanques que bloqueaban las principales rutas de escape de la ciudad y dispararon contra cualquier yezidi que intentara abandonar la ciudad.

Confederación de Medio Oriente

La Confederación de Naciones Indígenas del Medio Oriente y el Norte de África, compuesta de naciones confederadas, tribus y otras entidades, incluidos gobiernos en el exilio y organismos defensores que han adoptado un enfoque legal conjunto para abordar una amplia gama de preocupaciones y desafíos comunes a las minorías indígenas, incluida la seguridad y el reconocimiento jurídico y diplomático internacional. Las 66 naciones de CINMENA han ratificado el Pacto Internacional sobre los Derechos de las Naciones Indígenas (ICRIN) como condición previa para la membresía.

Figura 4: El logo de la Confederación de Naciones Indígenas de Medio Oriente y África del Norte refleja sus diversas herencias.

Aunque el Pacto Internacional sobre los Derechos de las Naciones Indígenas (ICRIN, por sus siglas en inglés) se ratificó por primera vez en 1994 hasta hace poco, ni una sola nación indígena en toda la región de Medio Oriente lo había ratificado (ni siquiera oído hablar de él) debido a una larga historia de aislamiento, conflicto y división. CINMENA nació como resultado directo de los esfuerzos incansables del Ministro de Justicia Sowilo para lograr el reconocimiento legal internacional de Ezidikhan, primero a través de la ratificación por Ezidikhan iraquí y luego por las comunidades yezidis de la región.

El Ministro de Justicia Sowilo había estado en contacto regular durante mucho tiempo con representantes de otras minorías oprimidas en todo el Medio Oriente. Después de aprender de ella sobre el Pacto Internacional sobre los Derechos de las Naciones Indígenas y cómo su ratificación refuerza el impulso de las naciones signatarias hacia la plena autonomía legal, las naciones y tribus se presentaron para solicitar la asistencia del Ministerio de Justicia de Ezidikhan para que ellos también pudieran redactar y ratificar ICRIN.

A mediados de 2020, dieciséis naciones de la región habían ratificado el documento del Pacto, incluidas las seis ramas de la nación yezidi Ezidikhan y naciones como los zoroastrianos y mandeanos en Irak e Irán, los beduinos palestinos, los ahwaz en Irán, las tribus bereberes en Libia, y Shabaks en Irak. Las naciones que pudieron enviaron a sus delegados a Shingal, Ezidikhan, donde el 21 de agosto de 2020 se firmó el Tratado de Shingal de 2020.

Figura 5: Agosto de 2020: líderes de minorías oprimidas encabezadas por Baba Sheikh (en el centro) se reúnen en Shingal

Gracias a los esfuerzos incansables del Ministro de Justicia Sowilo, desde entonces, un flujo casi constante de tribus indígenas, naciones y confederaciones más pequeñas han buscado unirse a la Confederación. Su Ministerio incluso estableció una junta de editores voluntarios y expertos legales para ayudar en la redacción y edición de documentos de ratificación del Pacto adaptados a los antecedentes y preocupaciones de cada tribu o nación solicitante.

La notable diversidad de las sesenta y seis naciones miembros de la Confederación y la comunidad de sus intereses nacionales aseguran la cooperación como un bloque de naciones. Sin excepción, cada nación miembro enfrenta variaciones del mismo conjunto de problemas centrales: su supresión como minorías por parte del aparato legal del estado; discriminación social y económica; negación de la legitimidad, e incluso de su propia identidad por parte de estados que buscan ejercer el poder sobre su pueblo.

En consecuencia, a pesar de sus diferencias y diferencias obvias, los países miembros de CINMENA encuentran amplios motivos para

una causa común, que se refleja mejor en el acuerdo unánime de 2022 de los países miembros para delegar en el negociador jefe Nallein Sowilo sus votos por poder en las negociaciones internacionales en reconocimiento de la comprensión de Sowilo de cada la posición de la nación miembro sobre una amplia gama de temas delicados. La elevación de la Sra. Sowilo de la oscuridad también refleja un amplio respeto y simpatía por ella como la principal exponente de la autonomía de Ezidikhan y otras naciones indígenas del Medio Oriente.

Tribunal Penal Internacional de las Naciones

De particular importancia e interés para Ezidikhan y otras naciones afectadas por la agitación en el Medio Oriente es el establecimiento de un Tribunal Penal Internacional para enjuiciar y responsabilizar a quienes cometen actos criminales de genocidio. Un Tribunal puede investigar, documentar, acusar y enjuiciar a las personas y entidades responsables de iniciar actos y políticas genocidas dirigidos contra los yezidíes y otras naciones.

Durante casi seis años, se han tomado medidas tras los ataques de ISIS para sentar las bases del Tribunal Penal Internacional de las Naciones Unidas. El Ministro de Justicia de Ezidikhan, Sowilo, representa aquí al gobierno y dirige la Confederación de Naciones Indígenas de Medio Oriente y África del Norte para establecer esta nueva institución internacional. No existe un tribunal internacional que tenga jurisdicción para juzgar los crímenes contra las naciones indígenas. La Corte Penal Internacional (CPI), la Corte Internacional de Justicia (CIJ) y las Naciones Unidas no pueden ejercer jurisdicción sobre el tema de los crímenes contra las naciones indígenas. Las esperanzas y aspiraciones de los pueblos indígenas que abarcan todo el Medio Oriente y el norte de África en todo el mundo están con el Ministro de Justicia Sowilo.

Nadie ha expresado sus esperanzas mejor que el Dr. Khalil al-Dulaimi, fundador y director de la Confederación Tribal Al-Dulaimi de Irak, quien recientemente dijo:

> عندما اتصلت نالين بنا من أجل المحكمة ، اعتقدنا أن الفكرة كانت وقتأ مثالأي وحدة العراق كجزء من المحكمة. نشعر أن القبائل ستعامل باحترام استقلالية شعبنا هي هدف يعود تاريخه إلى ألف عام ، ورؤية هذا الحلم يتحقق في وقتي المباشر هو شيء لم أفكر أبدأ أو الدليمي في أننا سنراه يحدث.” —خليل الدليمي

> Cuando Nallein nos llamó acerca de un Tribunal de Justicia, pensamos que la idea llegó en el momento ideal para unir a Irak bajo el Tribunal. Que la autonomía tribal de nuestro pueblo sea tratada con respeto es una meta que data de hace mil años. Ver este sueño hecho realidad en mi vida es algo que yo y la nación tribal Dulaimi nunca pensamos que sucedería.

Como siempre, muchas incertidumbres rodean un esfuerzo de un alcance tan vasto y complicado como el del Congreso de Naciones y Estados, incluso con décadas de preparación. Incluso en el mejor de los casos, una empresa de este tipo que involucre la colaboración a través de múltiples fronteras lingüísticas, religiosas y políticas enfrentaría desafíos abrumadores, incluido el patrocinio. En 2022,

con una guerra en el continente europeo, la crisis del cambio climático, las restricciones de la COVID-19 y una serie de crisis relacionadas, incluidos los costos en espiral del combustible y los alimentos básicos, lo que está en juego y los desafíos no podrían ser mayores.

"Nuestra historia de la creación habla de Melek Taus descendiendo sobre el Monte Shingal y plantando una semilla de trigo", dice el Ministro de Justicia Sowilo. "Y esa semilla se convirtió en todo lo que es vida, creando el universo a medida que crecía. Nuestras historias lo ven como el sitio del comienzo de la vida. Es por eso que Shingal es una montaña tan sagrada para los yezidis".

Por lo tanto, es apropiado que Shingal, la ciudad capital de Ezidikhan, que recientemente soportó atrocidades indescriptibles a manos de los extremistas intolerantes de ISIS, sea también el lugar de nacimiento de la primera Confederación de Naciones Indígenas de Medio Oriente.

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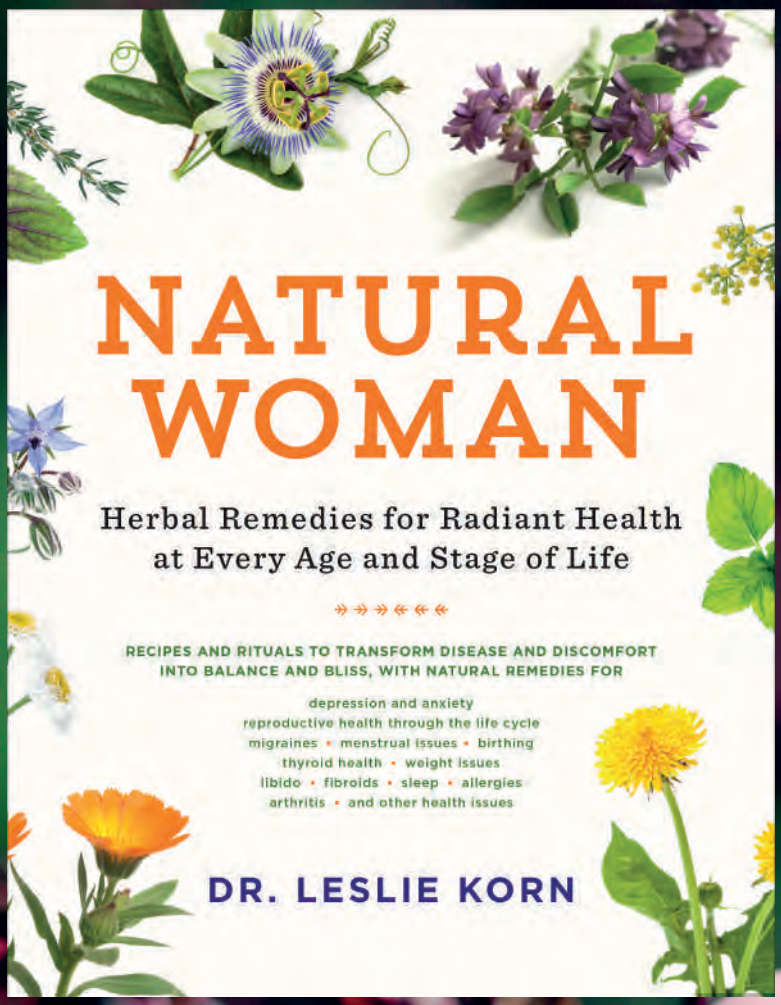
Patrick Harrigan es el Secretario de la Confederación de Naciones Indígenas del Medio Oriente y el Norte de África y es el Jefe de la Oficina de Información Pública de Ezidikhan. Obtuvo una maestría en estudios asiáticos en la Universidad de Michigan, realizó más estudios asiáticos en la Universidad de California-Berkeley y está capacitado en religión comparada e indología. Es un defensor de los pueblos y naciones indígenas. Desde 2014 se ha desempeñado como consultor político de la Nación Yezidi.



NATURAL WOMAN

Remedios herbales para una salud radiante a cualquier edad y etapa de la vida

Una guía de hierbas para mantener la salud física, mental y espiritual para mujeres y sus hijos en todas las etapas de la vida – por una sanadora con más de 40 años de experiencia.

"Mezcla historia, tradición y sabiduría atemporal en un enfoque moderno que nos ayuda a florecer en nuestra vida como mujeres".

-Bevin Clare, Presidenta de la Asociación Americana de Herbolarios

Tuhke Koaros mie Koasoaiepe de Poadope – Every Tree Has a Story

By Amy Eisenberg, Ph.D.

Photography by John Amato, RN
www.pbase.com/jamato8/fsm_pohnpei_micronesia_
Translation of title by Ringlen Wolphagen

ABSTRACT

I served as researcher at the College of Micronesia and suffered an injury to my arm. I was fortunate to be treated by honorable traditional healer Sounwini Lepen Lison Leon Aldis with his instructions for the use of traditional medicines, ceremonial prayers, and health practices. This article describes my experience with this beloved healer, traditional Pohnpei medicine and the myriad plant medicines of Pohnpei, Micronesia. Lepen's teachings guided me and here I report my experience with his permission. May he rest in peace. His memory is a blessing.

Many native plants are described with images to reveal their powerful attributes. The Story is told in narrative with photographs disclosing the richness of Pohnpei island medicines and the deep traditional food and medicinal knowledge held by Sounwini Lepen Lison Leon Aldis. I dedicate this paper in his blessed memory.

Keywords: Pohnpei, Micronesia, traditional medicine, agriculture, agroforestry

While serving as Sustainable Agriculture and Agroforestry Researcher at the College of Micronesia on the remote volcanic island of Pohnpei, I was attacked by a large and aggressive woman. Her Caucasian husband, my supervisor, was misappropriating United States Department of Agriculture monies and supplies. My Pohnpei colleagues and I reported that the "leadership" was "cooking the books"! This disclosure precipitated the attack.

My wrist was significantly injured in the assault, and the diagnosis was a triangular fibrocartilage complex injury. Serendipitously one afternoon, I met honorable Pohnpei traditional healer Sounwini Lepen Lison Leon Aldis when he was sustainably collecting medicinal plants and reciting prayers in the tropical forest of the beautiful mountainous island.

Figure 1. Pohnpei

He prayed for my healing and for justice to be served. Sounwini Lepen Lison Leon Aldis invited me to his home, where he and his lovely wife, Lampein Leilani work tirelessly helping people heal any hour of the day or night. Their home was open to those in need of healing, and all were welcome.

Figure 2. Sounwini Lepen Lison Leon Aldis and his family

Figure 3. Sounwini Lepen Lison Leon Aldis and me.

Sounwini Lepen Lison Leon Aldis prepared and administered healing plants to treat my injury and trauma. I was placed under an umwulap with steaming medicinal herbs. Pohnpei has an extensive pharmacopeia, and Sounwini Lepen Lison Leon Aldis was a deeply knowledgeable and well-respected traditional healer.

Figure 4. Healing drink prepared by Sounwini Lepen

"Tuhke koaros mie koasoaiepe de poadope"- "Every tree has a story", Pohnpei Director, National Archives, Culture and Historic Preservation at the Federated States of Micronesia National Government, Rufino Mauricio once told me.

While planting a memiap, *Carica papaya L.* tree in the Caricaceae on Pohnpei at Ohmine Elementary School with students and teachers, my Pohnpeian colleague Randall Harry casually removed his shoe, and a handsome centipede crawled out. "They never harm me," he said calmly, "Centipede, Meninrahn is my clan."

Figure 5. Planting Carica papaya tree at Ohmine Elementary School with students and teachers

The volcanic 344 km² western Pacific Island of Pohnpei is situated at 6° 54' N longitude and 158° 14' E latitude, north of the Equator in the Eastern Caroline Islands. Steep, rugged, and mountainous, Pohnpei is surrounded by mangrove swamps, naniak with an average annual rainfall of 190 inches (4800 mm). It is one of the wettest places on earth; its tropical climate, high rainfall, and deep volcanic weathered soils support a rich floral diversity. There are more than 935 vascular plant species on Pohnpei, of which 397 are indigenous and endemic (Herrera et al. 2010:1-2). For more than a hundred years, Pohnpei has been a center for agricultural experimentation and plant introductions in Micronesia (Ragone et al. 2001:290).

The strand vegetation, ni oaroahr (Herrera et al. 2010:2), medicinal shrub, remek, *Scaveola taccada* (Gaertn.) Roxb. in the Goodeniaceae grows near the rocky shore where it experiences salt spray, high winds, heat, and sunlight (Balick 2009:9). Remek has white flowers (Glassman 1952:98) that are added to nih, *Cocos nucifera* L. oil as perfume. Its large leathery spatulate leaves are chewed, and the bitter juice is squeezed out and drank. A Pohnpei elder informed me as he gathered the leaves along the shore for health. The buds are squeezed into the eyes to purify and cleanse them of debris in treating eye problems. For conjunctivitis, the white fruits are squeezed into the eye until better. Diabetes is prevalent on Pohnpei, and to treat type II diabetes, several young remek leaves are boiled in water and consumed until better (Balick 2009:401-402).

Dipwoapw, *Terminalia catappa* L., in the Combretaceae, is a medicinal tree originating from India whose native range is Madagascar, Tropical and Subtropical Asia to the Pacific. The seed kernel of the fruit is eaten as food when ripe. The flowers are greenish-white, and the fruits are green, ripening to yellow, containing an edible nut that tastes like an almond. Dipwoapw bark is administered to treat diarrhea on Pohnpei. The leaves possess potent antibacterial and antifungal properties (Lee et al. 2010:23-24; Glassman 1952:63; Balick 2009:356-358). Kapingamarangi expert Karmy Hicks informed us that the "Ghost Tree" is sometimes associated with spirit.

Sakau, *Piper methysticum* G. Forst., in the Piperaceae, is the sacred root on Pohnpei that is shared ceremonially with the greatest reverence and respect. Sakau is higher than the highest paramount chief or any living being or ancestral spirit on the island. Sakau defines the cultural

identity of Pohnpei, and it has been cultivated extensively in the upland forests of the volcanic island. Sadly, because of its high demand, the upland forests on Pohnpei have become depleted and the watersheds have been impacted by erosion consequently. Therefore, sakau farmers are strongly encouraged to "grow low" in the cultivated lowland agroforests.

Figure 6. Piper methysticum

Sakau is of divine heavenly origin according to Pohnpei stories and teachings (Ashby 2004:106), and all Pohnpeians acknowledge its extraordinary powers (Balick and Lee 2009:168). Sakau is used diversely in traditional healing. Its preparation involves squeezing the freshly pounded roots with a press of the inner bark of kolou, *Hibiscus tiliaceus* L., in the Malvaceae, on a special basalt stone slab. Pohnpeian sakau is unique throughout the Pacific islands since it contains the thick slimy consistency of kolou, *Hibiscus tiliaceus* tree sap. The brown mucilaginous fluid of the sakau and kolou inner bark strip press is squeezed into a coconut shell cup and shared. "Happiness permeates the space where sakau is consumed" (Balick and Lee 2009:177-179, 183).

Figure 7. Preparing Sakau

The fresh green fruit of the palm, pwuh, *Areca catechu* L., in the Arecaceae, betel nut is chewed with powdered slaked lime (calcium hydroxide) prepared from fresh coral or clamshell, and wrapped in kapwoi, a *Piper betle* L. leaf, Sometimes, tipaker, *Nicotiana tabacum* L., in the Solanaceae is added. Lee et al. (2010:121) noted that prolonged chewing of pwuh, *Areca catechu* results in significant toxic alterations in the mouth, upper digestive tract, and the intestinal epithelial cell lining. Laboratory and clinical studies reveal that betel nut acts synergistically with tobacco to produce oral cancer.

Mwahng, *Cyrtosperma merkusii* (Hassk.) Schott, in the Araceae is giant swamp taro. It is among the most culturally significant food plants on Pohnpei and the outer atolls along with breadfruit, bananas, yam, and coconut. The hardy mwahng is regarded with great reverence as the staff of life for outer island peoples, and its corms are quite large. There are numerous distinguishing cultivars of mwahng on Pohnpei

and the outer atolls. It is rich in essential minerals, vitamins, and fiber to maintain excellent nutritional health, enhance food security, and a sustainable environment. Like the other taro species, it is available all year round and can withstand strong winds and hurricanes, dry atoll climates, and sandy saline soils. Mwahng can remain in the soil for fifteen or more years and still be edible. The genetic diversity of taro cultivars on Pohnpei and the outer atolls is truly remarkable (Englberger et al. 2009:132-134, 139, 141, 146, 160).

Figure 8. *Cyrtosperma merkusii*

Sawahn awai, *Xanthosoma sagittifolium* (L.) Schott, and sawa, Colocasia esculenta (L.) Schott, in the Araceae are also important species of taro on Pohnpei (Glassman 1952:11, 108; Herrera et al. 2010:35). The nutritious corms are boiled and consumed. The red-stemmed sawa has been used exclusively for treating sting wounds from a stingray, likendinikep. The roots are wrapped in cloth, soaked in water and placed on the wound to relieve pain and draw out the poison. *Colocasia* corms have antioxidant and anti-inflammatory properties (Lee et al. 2010:12). Native to South America, *Xanthosoma* was reported to have been brought to Pohnpei during the Japanese occupation (Ashby 2003:211) however Ragone et al. (2001:306) indicated that the period of its introduction is not known. Ohd, *Alocasia macrorrhizos* (L.) G. Don var. *macrorrhizos* is believed to be the second oldest food on Pohnpei. Its large leaves are used to cover the traditional uhmw for cooking and to line the ground around the sakau stone (Englberger 2009:144-145; Balick 2009:255).

As Sustainable Agriculture and Agroforestry Researcher at the College of Micronesia, I worked cooperatively with government and non-governmental organizations toward improving health and nutrition on Pohnpei where vulnerable populations experience diabetes, hypertension, obesity, and dependence on inferior imported food, as a stark and grave reality. We provided agriculture, agroforestry, public health, eye care and veterinary resources to outer island communities and enhanced conservation of aquatic ecosystems, vital marine resources, addressing the significant impacts of climate change on small island nations. Crops are affected by erratic climatic events, diseases and drought.

We celebrated World Food Day, Rahn en Soumwet en Pohnpei. United Against Hunger, Miniminpense Sewese Pereh Duhpek, in the historic Pwunso Botanical Garden and conducted

community-based natural resource management and organic agriculture and agroforestry for improving human and environmental health, nutrition and food security on Pohnpei and the outer islands. We documented and addressed climate change through partnership approaches for safeguarding against climate impacts and gleaned a greater understanding of the challenges facing Pacific peoples, and the magnificent biodiversity of tropical island ecosystems. We promoted conservation of coastal and terrestrial ecosystems, indigenous resource management, invigorating the economy and supporting traditional agriculture and agroforestry. I studied with Pohnpei traditional plant healers and experts.

Figure 9. World Food Day

We practiced, trained, and shared seeds, seedlings, saplings and knowledge in sustainable organic farming and the preservation and enhancement of indigenous plant genetic resources. We investigated, cultivated and disseminated underutilized plant and tree species for enhancing sustainable diversified agriculture, agroforestry, nutrition and health. I collected, presented, and distributed nutritious fruits and other plant products and propagated fruit tree saplings and seeds of economically significant woody perennials.

Many economically viable trees in Kolonia's Pwunso Botanical Garden's living collection are aging, rotting, and not well maintained therefore we shared transplanted saplings and seeds for gardeners, farmers, schools and communities and created an arboretum of economically significant trees at the Agricultural Experiment Station in Palikir at the College of Micronesia. More than 433 new plants and trees have been introduced to Pohnpei in the past 150 years altering the natural environment and contributing to its subsistence and cash economy. The center of plant introductions was the former Agriculture Station, which is the Pwunso Botanical Garden. Plants were brought to Pohnpei from 33 different islands and countries. The Pwunso Botanical Garden's diverse trees and plants are a national treasure, which represents what was once the finest collection of economic and useful plants in the Pacific. May its 100-year legacy and germplasm be preserved (Ragone et al. 2001:298-302).

Weipwul, *Morinda citrifolia*, L., in the Rubiaceae is a large medicinal shrub or medium sized tree of the low coastal coral island forests of Pohnpei. It has large, deeply veined, glossy ovate leaves and small white flowers. The pungent edible fruits, flowers, terminal buds, leaves, stipules, bark, and roots have many diverse healing applications. Traditional stories indicate that weipwul was the first food on Pohnpei. Before there was breadfruit, mahi, *Artocarpus altilis* (Parkinson) Fosberg, and meipa, meikole,

Artocarpus mariannensis Trécul, weipwul was presented to the chiefs during feasts (Englberger et al. 2009:161, 172). The fruit extract of weipwul contains potent antioxidant compounds and antibacterial properties (Lee et al. 2010:13, 96). Small fruits and buds are used topically to bring down fever. Weipwul is taken nasally for migraines, and it soothes aches and pains. The terminal buds are applied for abscesses and the stipules are employed in treating wounds caused by scorpion fish. This woodland species' root bark yields a red pigment used for dyeing (Glassman 1952:19, 27, 94-95).

"Wein pein eni"- Fruit of the gods. Breadfruit grows freely and is available to everyone. – Pohnpei saying (Ashby 2003:208). The fruits of mahi, *Artocarpus altilis* (Parkinson) Fosberg, and meipa, *Artocarpus mariannensis* Trécul in the Moraceae are prepared as food on Pohnpei. They are rich in carotenoids, Vitamin C, protein, thiamine and dietary fiber (Balick 2009:443). The breadfruit tree collection in the Pwunso Botanical Garden is a valuable plant genetic resource that should be judiciously conserved, researched and maintained (Ragone et al. 2001:300). Stan from Yap explained that the dried androecium of *Artocarpus* is lit as a mosquito coil.

An extremely aggressive invasive species on Pohnpei is *Spathodea campanulata* P. Beauv., dulip en Aprika in the Bignoniaceae family. Native to West Africa, this fast-growing tree forms thickets and suckers competing with Pohnpei native plants for space, light, and nutrients. Dulip en Aprika's large orange-yellow flowers give rise to reddish brown seedpods with several hundred thin papery winged seeds that are widely dispersed by wind. It is quite difficult and challenging to control the establishment of this species however young trees can be pulled or dug out. Islands are highly vulnerable to biological invasions thus some introduced species on Pohnpei have caused tremendous loss in biodiversity and the degradation of natural ecosystems (Englberger 2009:2, 11).

The fast-growing invasive aromatic perennial shrub, sakau likamw, *Piper auritum* Kunth, in the Piperaceae is under eradication on Pohnpei. Native to Mexico, the Guianas, Ecuador, and other countries in Central and South America, it grows on Pohnpei in thickets in the forest understory and on cleared land along with the traditional and deeply significant and sacred sakau, *Piper methysticum*. *Piper auritum* is quite difficult to control as it spreads by suckers and the roots break when pulled (Englberger 2009:4).

Another fast-growing invasive perennial shrub, limemeirpwong, kehsapahl, *Mimosa diplotricha* C. Wright ex Suavalle var. *diplotricha*, (Balick 2009:389; Herrera et al. 2010:123) in the Fabaceae is native to Brazil. It forms dense thickets of spiny tangled stems that can trap animals and injure humans on Pohnpei. During the dry season, it is a fire hazard and the seeds that are dispersed by animals and water, remain viable in the ground for many years (Englberger 2009:18).

Wisolmat, masikisik *Chromolaena odorata* (Balick 2009:337; Herrera et al. 2010:89-90) in the Asteraceae is a noxious weed in the lowlands of Pohnpei. The invasive native perennial of Tropical America with an extremely fast growth rate and prolific seed production is found in forest clearings, along roadsides and open disturbed

areas of the island. It is toxic to animals and is a potential fire hazard during the dry season (Englberger 2009:16).

Risiel, *Clerodendrum paniculatum* L. in the Lamiaceae is native to India and Southeast Asia. It is an invasive ornamental perennial shrub with large heart-shaped leaves and a pyramidal shaped inflorescence. The colorful flowers are used to create mwaramwar (garland or lei) and to decorate houses (Balick 2009:405-406; Englberger 2009:23).

Dihng, *Cheilocostus speciosus* (J. Koenig) C. D. Specht, which is a synonym of Hellenia speciosa (J.Koenig) S.R.Dutta in the Costaceae (Herrera et al. 2010:44) is a tall invasive herbaceous perennial that is native to Malaysia. It grows in disturbed areas along roadsides and in the understory of forests on Pohnpei. This plant is used in making mwaramwar and to treat karakar (high fever) (Balick 2009:273; Englberger 2009:17).

Aipikohrd, *Coccinea grandis* (L.) Voigt (Herrera et al. 2010:105), in the Cucurbitaceae is native to Africa, India and Asia. It is an extremely aggressive perennial gourd vine that produces white stellate flowers and smooth red fruits. Aipikohrd, which was introduced for food and medicine, smothers native vegetation and is under eradication on Pohnpei (Englberger 2009:6).

Okira, *Abelmoschus esculentus* (L.) Moench, in the Malvaceae is an annual cultigen; a plant that has been altered through selective breeding. It is cultivated successfully on Pohnpei, and its mucilaginous green fruits are rich in pectin, iron and calcium, and are a quality source of fiber and nutrients for the people.

Chaya, *Cnidoscolus chayamansa* McVaugh is a synonym of *Cnidoscolus aconitifolius* subsp. *aconitifolius* Breckon in the Euphorbiaceae. It is an arborescent shrub with milky latex, large palmately lobed leaves and white flowers that is native to the Yucatan Peninsula of Mexico. It is cultivated on Pohnpei for human and animal consumption. Its young leaves and shoots are cooked and eaten in soups. The whole plant is fed to pigs. Chaya is a nutritious leafy green vegetable that is high in protein, fiber, vitamins, and minerals (Kuti and Torres 1996:516-520; Balick 2009:372).

Duhrien, rawahn, manka, *Pangium edule* Reinw. in the Achariaceae is an evergreen tree whose native range is Nicobar Island to the Western Pacific and Southeast Asia. It grows in forests on Pohnpei and bears large, edible sweet fruits with yellow flesh that are rich in provitamin A and other carotenoids (Balick 2009:319). I brought some to share on World Food Day - Rahn en Soumwet en Pohnpei. United Against Hunger, Miniminpense Sewese Pereh Duhpek, and they were well received.The seeds are used to trap and poison wild chickens on Pohnpei, however the seeds can be processed for consumption and have an almond-like flavor.

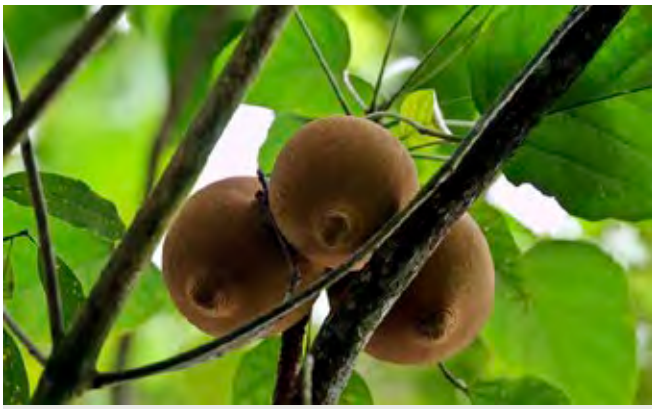


Figure 10. *Pangium edule. Achariaceae*

The fruit of kipar, deipw, *Pandanus tectorius* Parkinson ex Du Roi, in the Pandanaceae is a valuable indigenous Micronesian atoll food. The small to medium sized tree has aerial roots and stiff sword-shaped leaves that are barbed along its leaf margins and on the adaxial midribs. Its apetalous fragrant flowers are in a compact sessile head, and the aggregate fruit is large (Lee et. al. 2010:4-5) and bright orange. Fruit segments are an excellent source of provitamin A carotenoids, niacin, iron, thiamin, riboflavin, and Vitamin C with a high content of lutein and zeaxanthin (Balick 2009:292). There are numerous pro-vitamin A and carotenoid-rich *Pandanus* cultivars that should be promoted for their significant health benefits because Vitamin A deficiency is a serious health problem in the Federated States of Micronesia (Englberger et al. 2009:1-7). Some *Pandanus* species are cultivated for their large, sweet, and juicy edible keys (Herrera et al. 2010:63), fragrant flowers, useful leaves and stilt roots that are used as a building material. *Pandanus* roots and leaves are applied as medicine for curing the sting from a likendinkep, stingray (Lee et al. 2010:5; Rehg and Sohl 1979:231).

Figure 11. *Pandanus tectorius*

Mwoakil indigenous expert, Emihner Johnson of Island Food Community of Pohnpei and Lihn Mwoakilloa – Women's Group of Mwoakilloa, are deeply committed to restoring and preserving the kipar, deipw cultivars on Mwoakilloa atoll. They proposed to vegetatively propagate kipar, deipw cultivars along the shoreline of their small atoll. Kipar, deipw cultivars are well adapted to the saline, sandy and coralline soils of Mwoakilloa, where agricultural production and provision of a nutrient-rich diet are a great challenge. Planting kipar, deipw would contribute to food security, economic development, and would serve as a sea break for erosion control. Their collaborative project would mitigate the impacts of climate change and rising sea levels on vulnerable outer island communities. They proposed to identify and record the diverse cultivars of *Pandanus* on Mwoakilloa for preserving their culture and transmitting intergenerational plant knowledge about this indispensable tree for the Mwoakil people.

Pandanus is one of the most utilitarian fuel and fibrous plants on the outer atoll where Mwoakil artists use the leaves to create large woven mats, baskets, trays, placemats, and hats. The nutritious, juicy, pro-Vitamin A rich multiple composite fruits composed of individual pieces referred to as keys that are attached to a fibrous core, are eaten raw or baked and prepared as a flour or paste, which can be preserved for years. Mwoakil people chew, suck, and eat the sweet pulp of the inner part of the keys as a healthy snack and it is regarded as a social activity. The orange fruits are an excellent source of carotenoids, niacin, iron, thiamine, riboflavin,

Vitamin C, lutein, zeaxanthin, and fiber, which is essential for proper functioning of the intestines and bowel (Englberger et al. 2009:107).

Fiber consumption is tied to reducing the risk of diabetes, control of blood sugar levels and cholesterol. Kipar, deipw fruits are boiled and eaten or steamed, pounded into a paste and then dried in the sun or over hot stones. The dried cakes are broken and made into flour. There are some *Pandanus* cultivars with fruits that contain small edible seeds. The seeds are strung to create necklaces, the fruit fibers and root tips are fashioned into paintbrushes and the strong aerial roots are used to make local apparatuses to catch fish. Stilt roots are split and serve as crossbars in the construction of traditional houses (Balick 2009:292). As medicine, central leaves are consumed and young roots and leaf shoots are pounded, squeezed in water, and taken internally, or as an admixture in topical preparations with coconut oil.

Uhn Mahng is a fibrous *Pandanus* cultivar of Mwoakilloa that does not bear fruit. It is used for handicrafts and the stems are fashioned into harpoons for fishing. Its leaves and fibers are smoother and finer for weaving and creating earrings, ornaments, fans, baskets, mwaramwar, hats and belts. However today on Mwoakilloa, handicrafts are rarely sold. According to a survey of twenty households that was conducted by Emihner Johnson in July 2010, ninety percent of the households on the atoll grow only about three or fewer *Pandanus* cultivars and roughly ten percent of the households have six *Pandanus* varieties (Emihner Johnson, personal communication, 03 November 2010). This is critical because it is the most important tree on Mwoakilloa.

The Mwoakil people are noted for their superb carpentry skills in boat making. They use *Pandanus* for transport on the sea as part of their daily life; the mast, sail and outrigger are composed of its wood and fiber. The folklore, local art skills, food security and wellbeing of the Mwoakil community center around *Pandanus*. Emihner Johnson explained:

> We still have our roots, our identity and our moral values that make us Mwoakillese however we are losing our landmarks because of erosion and the depletion of our *Pandanus* cultivars. There are no more trees. The rising sea has been eating away at the land. Our surveys reveal that *Pandanus* is becoming rare. We are committed to bringing them back and to produce more *Pandanus* cultivars because without them, the local skills will not be passed on. Through learning sessions and training, many Mwoakil people are dedicated to preserving our local talents, the crafting skills of our elders who will pass them on. We seek ways that we can help and gain the knowledge and skills to be passed on to future generations.

The Mwoakil people seek to understand and record Mwoakil-*Pandanus* interactions in their cultural and environmental context, their diverse cultivars, and significant indigenous knowledge associated with this Mwoakil giving tree of life. This study was designed to further biodiversity conservation and the preservation of native plant

genetic resources on Mwoakilloa through the community-driven activity of planting *Pandanus* cultivars by asexual reproductive field methods. Island life and culture revolve around biological diversity. This life-sustaining tree that provides food, medicine, fiber, tools, fuel and support gave birth to the Mwoakil civilization, and will continue to enrich the lives of the people for generations. There is a great need for Pandanus on Mwoakilloa to ensure food security, and human and environmental health. "This is what I grew up with," Emihner Johnson explained. The nutritional value of *Pandanus* cannot be underestimated. She added, "The life of a developing *Pandanus* tree on Mwoakilloa, from 1-3 years, is tended to and monitored by women" (Emihner Johnson, personal communication, 30 November 2010). Restorative propagation of *Pandanus* with progressive community assessment and monitoring foster sustainable harvesting, equitable sharing of benefits from botanical resources, and sound coastal land management on Mwoakilloa.

Emihner Johnson stated:

> From 1975, when I grew up on Mwoakilloa, my family had a very small land mass. We had about eighteen varieties of *Pandanus*. Now, based on our survey and scientific values, there are fewer, and they are hard to find. What has been the talk of most Mwoakil women is the need to plant for the wellbeing of the people. This is our heritage, to preserve the craft. Other community members are so enthusiastic about this project. They will go back to Mwoakilloa to help this project. They are retired teachers, managers and congressmen who are willing to go back because it is significant to the next generation. There is a commitment, if we have financial assistance. We feel strongly about this initiative. Each will plant along the coast on one's own land. It is hands on training.

For the vulnerable small island atoll of Mwoakilloa, sound coastal area management and biodiversity conservation are key to community survival. Mayor Edmond of Mwoakilloa, village leaders and the community are in full support of the project that will strengthen viable indigenous management systems and community-based protection of Mwoakilloa's cultural and natural heritage. Local food educator, Emihner Johnson emphasized, "If I do this project, I know that I am going to move the sea!"

Emihner recently directed awareness in the Mwoakil community about local foods. Ninety-five percent of the women that she spoke with want to do something about the problem. Emihner explained:

> We are a very small community. Once we commit ourselves for our children, we will complete this project for their benefit. It is strongly gender-based. These are our moral values and what we grew up with. Women do not have a voice in community meetings. Women do all of the domestic work, bearing children, fishing…we do all of this. Yet we cannot be elected. We do not have a vote. Compared to women on Pohnpei, we are the firewood provider, and we go to the taro patch. Men's responsibilities are fishing and carpentry. However, building your own

cookhouse is a woman's responsibility! The women initiated and want to start this project. When I asked about it, the women really spoke out.

Improving vitamin A status in deficient populations can decrease health risks and health-related causes of mortality. Thus, *Pandanus* cultivars should be promoted as a strategy to diminish Vitamin A deficiency and to provide added health benefits, enjoyment and preservation of *Pandanus* genetic resources and the biodiversity of traditional Mwoakilloa indigenous knowledge systems.

Plant Medicines and their uses

Ilau, *Volkameria inermis* L. whose synonym is *Clerodendrum inerme* (L.) Gaertn. is in the Lamiaceae family. It is a native woody medicinal vine or small tree with aromatic opposite leaves and bell-shaped fragrant flowers. The leaves are employed to treat coughs, and to protect people from evil spirits while cooling fever, if the body is shaking. Pregnant women have been given ilau leaves during labor to protect them from evil spirits and to ensure a safe delivery. When combined with weipwul, *Morinda citrifolia* L. in the Rubiaceae, the leaves of ilau are applied to treat inflammation of the anal sphincter, and the young shoots are consumed to reduce stress (Lee et al. 2010:78, 88, 99, 119, 132). To treat a cough, rub the leaves between hands and rub under the chin. Consuming the diluted leaf juice may be beneficial for treating asthma. Yurlene gave me some leaves to apply to John's itchy scalp. I pounded the fragrant leaves and blended them with nih, *Cocos nucifera* L. oil and Sounwini Lepen Lison Leon Aldis' protective formula.

Ilau flowers and leaves are made into mwaramwar or worn directly in the hair. To treat headache, four young leaf apices are eaten (Balick 2009:404-405). The native range of ilau is Tropical and Subtropical Asia to the Western Pacific. The Kapingamarangi people use tihia, *Volkameria inermis* L. to reduce stress as it has antihypertensive properties pharmacologically. Glassman (1952:103) documented that the leaves are used in conjunction with other plants for treating rheumatism, as a hemostatic in menstruation and as an abortifacient.

Pwulok, *Xylocarpus granatum* J. Koenig is a medicinal mangrove tree in the Meliaceae with tannin-rich smooth bark, well-developed buttresses and an intricate above ground root system. It has alternate leaves, small white or pinkish flowers, and the fruit is a large, globose, pendulous woody capsule. The heartwood is reddish brown and the extraordinary Kapingamarangi carvers use this wood in their works of art. Pwulok is among the most important wood for making canoes and it grows in the naniak, mangrove forest on Pohnpei in tidal swamps of brackish or salt water (Glassman1952:21, 23; Herrera et al. 2010:2). The bark scrapings are employed in the umwulap treatment for healing muscle, joint or backpain (Balick 2009:441).

Mahrek, *Cyclosorus heterocarpus* (Blume) Ching in the Thelypteridaceae is an indigenous medicinal fern of Pohnpei lowland and primary forests and cultivated land. The young fronds of mahrek in circinate vernation are pounded and applied as a poultice on boils to reduce swelling (Lee et al. 2010:43). To use as soap, the fronds

are mashed and rubbed onto the skin. The fronds are employed as a wrap for other medicines on Pohnpei (Balick 2009:249).

Wihnmoar, *Barringtonia racemosa* (L.) Spreng. in the Lecythidaceae is a medium sized medicinal tree of freshwater swamps on Pohnpei whose ellipsoid or conic fruits are used as laundry soap (Balick 2009:11, 418). The fruit scrapings mixed with nih, *Cocos nucifera* L. meat, are rubbed onto skin rashes and the stem epidermis is employed in treating back pain in men. The bark has analgesic properties as it contains phenolic and steroidal constituents (Lee et al. 2010:58, 154). The terminal buds are used to alleviate pain after childbirth and for treating earaches (Glassman 1952:62). The seed scrapings of the fruit are applied to fungal infections (Balick 2009:420).

Oahr, tepwek, *Premna serratifolia* L. in the Lamiaceae is a lowland, low-growing medicinal shrub, or small tree with opposite leaves. Its leaves, when placed on a fire to create smoke, repel mosquitos. Young shoots are used as a charm to improve luck when fishing. Bark scrapings are boiled in water and consumed to treat asthma. For fungal infections, many fruits are pounded, wrapped in cloth and rubbed gently on the skin (Balick 2009:409-410). Pounded leaves are mixed with nih, *Cocos nucifera* L. oil and applied to insect bites until healed. Tepwek leaves are crushed and placed on boils held in place by another fire-warmed leaf with nih oil. The stem epidermis is scraped and wrapped in cloth and the juice is placed in water and consumed to treat coughs. Tepwek shoots are pounded and placed in cloth and the juice is squeezed into each nostril for relieving severe headaches. On Mwoakilloa Atoll, oahr leaves are boiled in water and patients with hepatitis are showered with the infusion (Lee et al. 2010:15, 50, 83, 95, 115). Under an umwulap, tepwek leaves are applied as a steam inhalant for clearing the lungs.

Konok, *Piper ponapense* C. DC. in the Piperaceae is a fragrant indigenous ornamental vine that grows on *Ficus* and other tall trees. Its plant parts are used to alleviate stomachaches (Glassman 1952:55), headache, joint and back pain, conjunctivitis, sore eyes, boils, cuts, toothache, symptoms of syphilis in men, and depression. The vine is used to scrub clean the *Piper methysticum*, sakau stone with water. The leaves and vines are made into mwaramwar (Balick 2009:470-473; Lee et al. 2010:90, 111).

Kaikes, *Adenanthera pavonina* L. in the Fabaceae is a native, medicinal fast-growing deciduous nitrogen-fixing tree whose native range is Tropical Asia (Glassman 1952:74) to Northern Australia. Its leaves are bipinnately compound, and the flowers are small and yellowish. Kaikes has dehiscent pods with nutritious shiny scarlet red seeds that are roasted and eaten by children. The young leaves can be cooked and consumed. Its trunk is used as a stake for supporting *Piper nigrum* cultivation and its wood is fashioned into small structures such as cookhouses (Balick 2009:379-380). Kaikes grows in the nansapw, the secondary agroforest (Balick 2009:10) and the area of agricultural cultivation and human settlement on Pohnpei (Herrera et al. 2010:2).

Luwekindenloal, *Phyllanthus mariannensis* W. L. Wagner & Lorence in the Phyllanthaceae is a tree or shrub with ovate leaves that is endemic to the Mariana Islands (Lorence and Wagner 2011:79; Herrera et al. 2010:160). Shortly after marriage, women drink an infusion of the plant parts to aid conception. Some luwekindenloal plant parts are applied to relieve emotional distress (Glassman 1952:70), and the fruits are consumed to decrease anxiety. Two fruits of the plant are wrapped around young leaves and eaten each morning for eight days to treat a broken heart. Four or eight fruits are consumed for treating depression, or four leaves are pounded, wrapped in cloth and squeezed into water, and drunk. To stimulate a baby's appetite, the parent chews eight leaves until soft, placing small pieces in the baby's mouth (Balick 2009:461-462).

Several species of *Cinnamomum* are grown and utilized on Pohnpei. Madeu, *Cinnamomun carolinense* Koidz., in the Lauraceae is a native forest tree of low elevations with fragrant bark, abundant yellowish-white flowers (Glassman 1952:53), alternate, ovate leaves, and round fruits (Lee et al. 2010:81, 148). It is used to prepare a refreshing beverage, as a seasoning (Ashby 2003:223), and as medicine. The yellowish-brown bark is cut from the tree, boiled in water and consumed regularly as tea, and is regarded as an immunostimulant. Madeu has been administered to treat syphilis, arthritis, and joint pain on Pohnpei. The bark contains the carcinogenic compound safrole that has been known to cause liver cancer however, when the bark shavings are boiled during the traditional Pohnpeian preparation of madeu as tea, the safrole is degraded and cannot be found in the prepared beverage (Balick 2009:414). The bioactivity of safrole is altered, thus preventing the hepatocarcinogenic effect (Lee et al. 2010:81). The inner bark has been used as a hemostatic for excessive menstrual flow (Glassman 1952:53). The pounded stem epidermis of madeu, *Cinnamomun carolinense* with inipal, coconut fibers, are used to treat back pain in men. The juice is squeezed into water and consumed daily for eight days (Lee et al. 2010:148). *Cinnamomun verum* J. Presl, whose native range is Sri Lanka, was introduced from Java during the Japanese occupation of Pohnpei and is used as a spice (Balick 2009:415).

Figure 12. *Cinnamomum*

Katar, *Sphaeropteris nigricans* (Mett.) R. M. Tryon, a synonym of *Cyathea nigricans* Mett. is a pantropical tree fern in the Cyatheaceae with a large black, pubescent midrib. Its brown spores are contained in numerous sporangia on the abaxial surface of the fertile fronds. The thick and fibrous trunk, with its inner solid core is a support for *Piper nigrum* and orchid cultivation (Figure 16) (Figure 17). As a result, this species is at risk of endangerment and possible extinction on Pohnpei (Lee et al. 2010: 131).

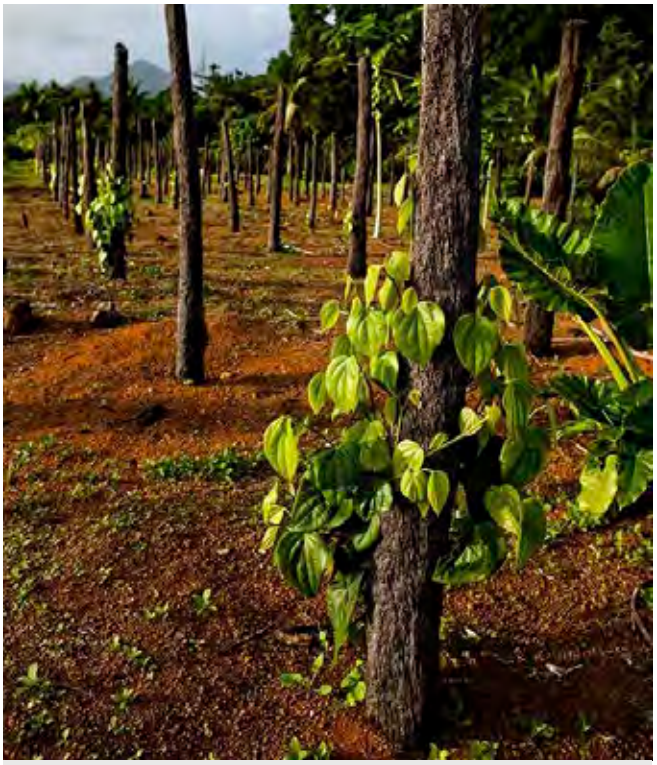


Figure 13. *Sphaeropteris nigricans*

Katar grows in the highland nannahna, wet and humid dwarf elfin moss forests on Pohnpei (Herrera et al. 2010:4-5). The fronds are eaten as food, and the durable trunks are used as posts in house construction (Glassman 1952:20) and for making footbridges. When it is raining and chilly in the forest, the fronds are utilized as thatch for hut walls, and roofs, and Pohnpeians cover themselves with the fronds as a blanket to keep warm and dry. The fronds also make a soft sleeping mat. Katar is applied as a styptic to stop bleeding, prevent infection, and heal wounds. The frond petiole is cut, and the meristem tissue is scraped and mixed with the frond fiber and a young frond in circinate vernation and placed inside the wound (Balick 2009:228-230). An infusion of the fronds is employed as a contraceptive for women (Glassman 1952:40).

Katar is used to alleviate excessive menstrual flow. A young shoot is cleaned and combined with the meat of a young ripe fallen fruit of nih, *Cocos nucifera* L. The nih drupe fruit is cut in half, and its endosperm is scraped out and pounded together with the young katar shoot and inserted into the vagina. This treatment is reported to stop excessive menstrual bleeding (Lee et al. 2010:131).

I encountered the erect, spreading medicinal perennial, *Calotropis gigantea* (L.) W. T. Aiton in the Apocynaceae on Pohnpei along the margin of woodlands and in sandy soils. This fiber-producing shrub's native range is from South China to Tropical Asia however it has become naturalized in many countries. Its showy corolla is lilac to purple, its fruit is an ovate follicle, and its thick fleshy leaves are opposite and entire. This toxic plant produces milky latex, and it is bitter.

Figure 14. *Calotropis gigantea*

Peinuhpw, *Paraderris elliptica* (Wall.) Adema in the Fabaceae is a vine or liana (Herrera et al. 2010:123) with entire oblong leaves, pink flower petals, and brownish winged fruits. Traditionally, young stems are chewed to treat stress. Peinuhpw has powerful antioxidant and antibacterial properties. Rotenone, the highly potent mitochondrial toxin, was isolated from the root

(Lee et al. 2010:103-104) and used for poisoning fish (Glassman 1952:76). The roots are pounded to prepare the fish poison, which stuns reef fish. The pounded roots are placed under coral rocks to catch the fish. Roots are collected, mashed, and placed underwater beneath rocks, where the fish live. Within minutes, the fish are stunned or die. For treating itchy skin or skin rash, roots are cleaned, pounded, and mixed with shredded copra placed in a cloth or *Cocos* fiber and applied to the skin. The large stems are used as rope, and the young leaves are applied to treat ear and vaginal infections. Young leaves are ingested to ease labor, and for bedwetting in children, very young leaves are rubbed in the hands and the juice is squeezed onto the child's penis or labia majora (Balick 2009:390-392). Peinuhpw is also used to treat pigs that have worms. Anna at the Village informed us that peinuhpw is used as a natural insecticide on Pohnpei. The roots are squeezed to extract the juice and sprayed onto agricultural plants. She added that it is also mixed with nih, *Cocos* oil and applied to the skin to treat dermatitis and infections.

Tuhke karisihn, *Falcataria moluccana* (Miq.) Barneby & J.W. Grimes, a synonym of *Falcataria falcata* (L.) Greuter & R. Rankin is a large, introduced, fast-growing tree in the Fabaceae with pinnately compound leaves and small white flowers. It is used as firewood on Pohnpei. Ringlen Wolphagen informed me that this highly flammable tree produces a light, soft wood that makes excellent canoes. Nitrogen-fixing tuhke karisihn improves soil fertility for growing mahi, *Artocarpus altilis* and sakau, *Piper methysticum* (Balick 2009:387-388). Tuhke karisihn's native range is Maluku to the Santa Cruz Islands.

Pwuhr en Pohnpei, *Fagraea berteroana* A. Gray ex Benth. Is an epiphytic tree in the Gentianaceae, whose native range is Papuasia through the Pacific. It grows in the nanwel, the greatly threatened upland forest of primary vegetation on Pohnpei (Herrera et al. 2010:4; Balick 2009:12). Pwuhr en Pohnpei has many branches, smooth, thick leaves, fragrant, fleshy tubular flowers, and succulent fruits. The fruits are applied to treat boils that develop under arms and on testicles (Lee et al. 2010:48). The sticky flesh of the peeled fruit is used as a flytrap to draw flies away from food. The flowers are made into special mwaramwar, head garlands, and leis, and as a charm for protection against sorcery. The fruits and buds are used to treat kilsarawi, shingles, *Herpes zoster*, and the fallen leaves are used to treat kanahria, gonorrhea. Young shoots are pounded and ingested with water to treat kidney stones and pounded young shoots and leaves are consumed with water for treating other kidney ailments (Balick 2009:398-399).

Ais, *Atuna racemosa* Raf. Subsp. *racemosa* is a large tree in the Chrysobalanaceae that grows in the nanwel, the highly threatened upland forest ecosystem of primary vegetation on Pohnpei, whose substrate is of weathered volcanic rock (Herrera et al. 2010:4; Glassman 1952:29). Large ancient trees grow on the weathered volcanic substrate of this richly resplendent tropical forest (Balick 2009:11; Herrera et al. 2010:4). The enduring wood of this tree is used for house construction and spearing fish. Ais fruits are a source of glue or paint. The nuts are scraped and mixed with the red soil of Nanpwoarenais, Madolenihmw. This mixture is placed in a pot over a fire and stirred until it becomes a thick red

resin used to paint and protect the wood of canoes from rotting. The roasted and grated seeds are a source of varnish. A protective paint is also made when the seeds are roasted in a metal container in an uhmw for half an hour. Seeds are then grated and squeezed to obtain the liquid used to paint canoes with inipal, *Cocos nucifera* L. fiber. Fruits are used as an insect repellent by placing them in a fire, whereby the smoke keeps mosquitoes away. The fragrant fruit and seed scrapings mixed with nih, *Cocos nucifera* oil are applied to enhance skin and hair. The ripened fruit is applied to the skin to make it beautiful, and the white seed oil is placed on rashes. Ais bark is used to treat bloody diarrhea and amoebic dysentery. The grated seed is employed as medicine for treating dysentery and yaws, *Treponema pallidum* subsp. *Pertenue*, the chronic disfiguring and debilitating tropical bacterial infectious childhood disease (Balick 2009:349-350; Glassman 1952:19, 73).

Nih, *Cocos nucifera* L. in the Arecaceae is the palm of life for Pacific peoples. This tall pantropical species grows in the low coral island forest or atoll forest and in the nansapw. This is where agricultural and agroforestry cultivation and human settlements are found on Pohnpei (Balick 2009:9; Herrera et al.:2). Kapingamarangi friend, Karmy Hicks, informed me that pahi, slings are made from the husks of tiniu, *Cocos nucifera* L. in Kapingamarangi language. Uhpw, the sweet liquid inside the fruit of *Cocos nucifera* is a refreshing drink. Oil is extracted from copra, which is produced after the endosperm of the fruit is dried in the sun. Leaf base fiber is employed as cloth for placing and squeezing medicinal plants rubbed on the skin. Nih flowers are applied to dog bites and are consumed as liquid for treating dysentery. As an eye wash, the inner part of the leaf stalk is scraped in cloth and squeezed into the eye. The roots are pounded, squeezed, and consumed in water for treating seizures (Balick 2009:263, 265).

Figure 15.*Cocos nucifera*

Oil from the fruit of nih is a valuable emollient, and the husk fiber extract has antibacterial and antiviral properties for treating skin infections. The roots of nih are cut, cleaned, pounded, and wrapped in cloth, and the juice is squeezed into water and consumed to treat Hepatitis A (Lee et al. 2010:17, 114). Nih is an indispensable ingredient in many medicinal preparations for treating diverse ailments on Pohnpei.

Nih husks provide sennit, cordage for binding traditional house beams, fastening outriggers to canoes, and as fuel. The hard shell of the coconut serves as an excellent container for liquids and is fashioned into jewelry. “Sohte wasa ehn nih me sohte ah doadoahk.” – “There is no part of the

coconut palm to throw away." – Pohnpei belief (Ashby 2003:215).

Puka, *Pisonia grandis* R. Br. is a synonym of *Ceodes grandis* (R. Br.) D. Q. Lu in the Nyctaginaceae. It is a tropical island native tree with soft light wood and large light green elliptic, oblong, or ovate leaves with long petioles. It grows in dense stands on coral cays and islands in the Indian and Pacific Oceans and adjoining coastal areas, from Madagascar to Polynesia. Kapingamarangi expert Karmy Hicks informed us that the large, pleasant-tasting leaves are eaten fresh or cooked. Puka is used as medicine for treating hypertension and diabetes. The leaves are also fed to pigs. Puka can be propagated vegetatively. Adelina Lepehn indicated that this tree is called mehs in Mwoakilloa language. According to the Missouri Botanical Garden, thickets of this tree are preferred nesting sites for some seabirds that disperse the sticky seeds from island to island.

Oahs, *Metroxylon amicarum* (H.Wendl.) Hook.f. is a tall native palm in the Arecaceae with a large paniculate terminal infloresence. It grows in coastal freshwater wetlands and highland rainforests of Micronesia. Its imbricated fruits, which are round to pear-shaped are carried by ocean waves, and its seeds are disseminated by water or wind. The roots are employed as medicine for treating high fever, caused by shaking sickness. The root pulp is consumed with water until shaking ceases. Boiled oahs roots in water are also reported to treat back pain. The patient drinks the beverage copiously for eight days (Lee et al. 2010:120, 151). Oahs bark is scraped, pounded, squeezed into a cup, and consumed to treat diarrhea. The roots are pounded, wrapped in Cocos fiber, and squeezed into a cup of water and consumed to treat seizures (Balick 2009:266-267).

Oahs is a valuable palm for weaving, construction, and ornamentation (Ashby 2004:234). For many years, buttons have been manufactured from the fruits of the ivory nut palm (Glassman 1952:19). The large leaves are harvested and sewn together for roof thatch, and the wood is employed as lumber. The ivory are carved into necklaces and small sculptures.

Figure 16. Oahs

Chrysophyllum cainito L. is the introduced tropical American star apple tree in the Sapotaceae cultivated for its nutrient-rich edible fruit (Ragone et al. 2001:322). The delicious oval-shaped subglobose fruit is smooth-skinned and purple when ripe. Pohnpei children apply the sticky leaf petioles with shiny elliptic leaves to their face and ears.

Figure 17. *Chrysophyllum caimito*

Pouteria campechiana (Kunth) Baehni in the Sapotaceae was cultivated in Pohnpei's historic Pwunso Botanical Garden for its nutritious fruit. The sweet and delicious smooth yellow-orange eggfruit is rich in carotene (provitamin A). Many drupe fruits had fallen from the tree and their seeds germinated. Bill Raynor and I collected and widely shared the large glossy seeds and young saplings with farmers and gardeners as it grows beautifully on Pohnpei. *Pouteria* leaves are evergreen and alternately arranged, and the slender trunk is furrowed, producing white latex. Its spreading crown with young velvet brown branches gives rise to fragrant flowers. The native range of this wonderful tree is Mexico to Central America.

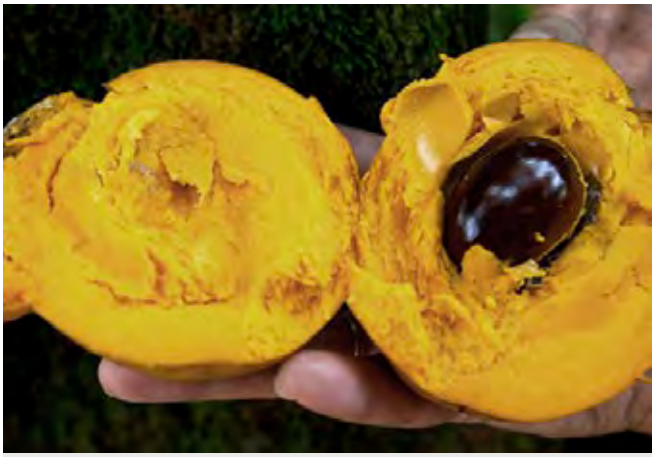


Figure 18. Pouteria campechiana

Mworopw, *Inocarpus fagifer* (Parkinson ex F.A.Zorn) Fosberg in the Fabaceae is an evergreen tree native to Malesia and the South Pacific islands. It grows along the coast of Pohnpei, beside riverbanks, uplands, and taro patches. Tahitian chestnut has a dense canopy of glossy, oblong alternate leathery leaves, and fragrant white flowers. It produces irregular, ovoid, or oblong, slightly flattened edible fruits that are boiled, roasted, or baked. On Pohnpei, the nutritious fruits are boiled for an hour or two, and the skin is removed. Mworopw is a medicinal tree whose inner bark is scraped and mixed with other healing leaves for treating diarrhea. A strip of the inner bark with pounded leaves of marasau, *Aglaia mariannensis*. Merr. in the Meliaceae are wrapped in cloth and squeezed into a cup of water and consumed to treat amoebic dysentery. Bark scrapings are pounded and wrapped in inipal, Cocos fiber, or cloth and squeezed into water, and drunk for treating joint and muscle pain and headache (Balick 2009: 388-389, 438-439). Glassman (1952:78) noted that mworopw wood is an excellent kindling.

Figure 19. Inocarpus fagifer

There are several medicinal fungi on Pohnpei. Saleng en eni, *Favolaschia manipularis* (Berk.) Teng = *Filoboletus manipularis* (Berk.) Singer in the Mycenaceae is a bioluminescent Basidiomycetes fungus that grows in clumps on dead wood in Pohnpei forests. Didimwerek is its common name, which means phosphorescent and sparkles because it glows in the dark (Balick 2009:221; Rehg and Sohl 1979:205). It has a white to pale cream convex to bell-shaped umbonate pileus with a brown tinted central raised umbo and rounded symmetrically arranged adnate pores on its undersurface. Its central, white to ivory-colored stipe is covered with minute scales.

On Pohnpei, earaches are treated by placing saleng en eni into half a nih, *Cocos* shell. Heated stones are then put on the fungi and the other half of the *Cocos* shell with a hole in it encloses and covers the bottom nih shell. The steam, which comes out of the shell hole is directed into the painful ear. Saleng en eni is also rubbed onto sore arms, etc. to relieve pain. Eni refers to ghost, usually malicious (Rehg and Sohl 1979:9). Some Pohnpeian people fear and consider bioluminescent fungi to be related to eni (ghost) and they tell little children to behave or eni in the forest may torment them (Balick 2009:221).

Diospyros discolor Willd. In the Ebenaceae was planted in the historic Pwunso Botanical Garden on Pohnpei. This tree was introduced from Hong Kong during the German occupation for its edible fruit (Ragone et al. 2001:311; Balick 2009:369; Herrera et al. 2010:105). Mabolo is a dioecious species with evergreen alternate leaves, white waxy 4-merous flowers, and beautiful oblate yellow, orange, dark reddish-purple young fruit that is mildly sweet, tart, and mealy. Its native range is Formosa to Borneo.

Dillenia indica L. in the Dilleniaceae was also planted in the historic Pwunso Botanical Garden for its edible fruit (Ragone 2001:311; Balick 2009:369); Herrera et al. 2010:105). The elephant apple is a medicinal tree with large, beautiful fragrant flowers and edible fruit composed of fleshy sepals that can be eaten raw or cooked. Its native range is temperate and tropical Asia, from India to China and West and Central Malesia.

Nihn, *Ficus tinctoria* G.Forst. in the Moraceae is a medicinal tree which begins its life as an epiphytic strangler that develops into a large banyan tree with prop roots. Its dark green and glossy ovate leaves are alternately arranged, and its axillary syconium fruits are usually paired. On Pohnpei, nihn roots are harvested to treat back pain. They are placed in cloth with a hot stone and applied to the painful area until symptoms subside (Lee et al. 2010:91-92). A liep, which is a cord looped around ankles for climbing nih, *Cocos*

trees, is made from a strip of bark of a small nihn sucker that is softened and twisted. Ropes, belts, and enduring fishing lures are also made from nihn bark. The wood is used in construction and as firewood. This powerful plant is used to keep ghosts away from an ill person. The latex from the cut trunk is applied to cuts and wounds. The fruits or leaves are pounded and placed in a cloth and squeezed into the ear to treat earache (Balick 2009:446-448). Pohnpei expert Melvin informed me that the milky sap from chewed leaves can be applied to dog bites and other wounds. Nihn is native to Hainan, China, and the Pacific.

Spondias dulcis Parkinson is a vigorous deciduous tree in the Anacardiaceae with smooth pinnately compound leaves, small white flowers in terminal panicles, and sweet and acidic oval fruits whose endocarp has spiny projections. It was introduced on Pohnpei for its edible fruit (Ragone et al. 2001:305; Balick 2009:324; Glassman 1952:87). Its native range is East Malesia to the Santa Cruz Islands.

Figure 20. *Spondias dulcis*

Manilkara zapota (L.) P.Royen in the Sapotaceae family was introduced from Java to Pohnpei for its latex during the Japanese occupation. It is native to Central and South America and is grown pantropically for its edible fruit (Balick 2009:496; Ragone et al. 2001:322), medicinal properties, wood and latex. Glassman (1952:22) indicated that it was cultivated in the Agricultural Experiment Station on Pohnpei for its fruit. *Manilkara* is an ornamental and medicinal tree grown in tropical regions for its fruit, and its bark yields latex for chicle-chewing gum. Various parts of the tree have diuretic and tonic properties for treating inflammation, pain, fever, coughs, dysentery, and diarrhea.

Koatun, *Ceiba pentandra* (L.) Gaertn. is a tall, deciduous ornamental tree in the Malvaceae with a straight trunk that is wide and buttressed at its base. The smooth bark has conical spines and the palmately compound leaves have 5-9 foliolate, narrow elliptic-ovate entire acuminate leaflets. Kapok is native to Mexico through tropical America (Glassman 1952:67) and was introduced on Pohnpei during the German and Japanese occupations for its fiber (Ragone et al. 2001:308; Balick 2009:426). The brown, oblong fruits are capsules containing smooth black seeds that are surrounded by silky cotton-like fibers. Koatun is employed to treat boils on Pohnpei. The shoots of young leaves are pounded and applied to the boil as a poultice until it opens and drains (Lee et al. 2010:40-41). Some Pohnpeian people eat the black seeds, and the fibers are used for making pillows.

Auleng, *Curcuma australasica* Hook.f. is a native medicinal turmeric on Pohnpei in the

Zingiberaceae. Its leaves are applied to prepare mahr, preserved, and fermented breadfruit. Many auleng leaves are placed in the ditch for wrapping fermented food (Balick 2009:80). Welsihter from Pingelap informed me that she dries the rhizome of auleng and pulverizes it for healing wounds and rashes. For making skin smooth, the rhizome is scraped and mixed with grated nih, *Cocos nucifera*, and is squeezed onto the body before showering. For treating infections and infected cuts, the tuber is cleaned, pounded, and squeezed onto the infected area (Balick 2009:311-312). Glassman (1952:107) reported that auleng is frequently found in the rainforest on Pohnpei.

Eugenia uniflora L. is a medicinal, ornamental, and many-branched small tree or shrub in the Myrtaceae with opposite, simple, oblong leaves and fragrant white flowers. The fleshy and juicy green fruits with 1-3 resinous seeds turn deep scarlet, bright red, orange, crimson, dark purple, or maroon when ripe. *Eugenia* is native to Brazil and southern South America. It was introduced on Pohnpei at the Agricultural Experiment Station for its edible fruit (Ragone et al. 2001:317, Herrera et al. 2010:154), an excellent source of Vitamin C.

Santol, *Sandoricum koetjape* (Burm.f.) Merr. is a large tropical, medicinal ornamental evergreen tree in the Meliaceae that produces delicious, golden colored globose or oblate fleshy edible fruits that are eaten raw or cooked. Its native range is Malesia to New Guinea, however it is widely cultivated and naturalized. Santol was introduced on Pohnpei in the Agricultural Experiment Station for its nutritious fruit (Ragone et al. 2001:316) that can be dried, candied, or made into jams, jellies, and marmalades. The ripened fruit is also fermented with rice to make an alcoholic beverage. Augustine called the fruit, a capsule, "golden apple star" and said that it was like soursop in the center. The tree has spirally arranged trifoliate leaves that are elliptic to oblong-ovate. Its fragrant wood is used for its aromatic properties in perfumery, and the bark is employed in tanning fishing nets in the Philippines. *Sandoricum* is also valued in Asia for its wood and as a shade tree. On Pohnpei, santol was growing below the track by PICS, Pohnpei Island Central School.

Pwompwomw, *Passiflora foetida* var. *hispida* (DC. ex Triana & Planch.) Killip is a synonym of *Passiflora vesicaria* var. *vesicaria* L., according to Kewscience Plants of the World online (http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:184938-2). Pwompwomw is a slender herbaceous vine in the Passifloraceae. It is native to Tropical America and was introduced and has become naturalized throughout the tropics. It grows along roadsides and abandoned fields on Pohnpei (Glassman 1952:26). The tart and fleshy orange ellipsoid or globular fruits are eaten as food. They have a distinctive odor when opened. The vine is used as medicine to treat fever and skin diseases in babies and other children's illness and the tendrils are pounded with stone and applied to boils to drain and reduce pain (Balick 2009:461; Lee et al. 2010:46-47)). Pwompwomw has three-lobed leaves with glandular hairs, and the bracts subtending the flowers and fruits are finely and deeply dissected.

Ketieu, *Ixora casei* Hance in the Rubiaceae is used as medicine on Pohnpei to treat childhood illnesses such as skin diseases and boils. Ketieu

is employed in treating the stings from rarahni, crown of thorns starfish (Lee et al. 2010:6, 39). It is native to the Caroline Islands, Marshall Islands, and the Gilbert Islands, and it grows in the nansapw, secondary vegetation on Pohnpei. The nansapw is where agricultural cultivation takes place and human settlements exist (Herrera et al. 2010:3-4; Balick 2009:9-10). The roots of ketieu are used as a hemostatic in menstruation. In the past, spears were made from its wood (Glassman 1952:94), and currently, a nahi, stick is made from a short piece of ketieu wood for lashing to the breadfruit harvesting pole with pwehl, *Cocos* fiber cordage (Balick 2009:76).

Rose Mulholland, an innovative farmer in Dolonier, Nett observed that tiny black ants were eating the white flies on her *Capsicum* L. plants. So, she sprinkled sugar around her *Capsicum* plants that had white flies to draw the ants, and the following day, she observed that the leaves of her *Capsicum* plants were cleared of white flies!

Ioakim was given a *Garcinia mangostana* L. sapling After two months, I noticed that the little tree looked more developed than any other *Garcinia mangostana* sapling I had encountered on Pohnpei. I asked Ioakim what he was doing to enhance the growth of his sapling, and he stated, "I added a little salt to the soil. Since people need some salt, I thought that plants do too." The leaves looked very well.

Garcinia xanthochymus Hook. f. ex T. Anderson is an evergreen tree in the Clusiaceae that was introduced to Pohnpei for its edible fruit (Balick 2009:353; Ragone et al. 2001:310). The fragrant yellow acidic globose or ovoid fruit is eaten raw or cooked. It can be made into jams, jellies, curries, sherbet, and vinegar and the fruit's juice produces a dye. *Garcinia xanthochymus* is the source of a useful gum-resin. Its native range is the Indian Subcontinent to Yunnan and Southwest Guangxi Provinces, China, and Indochina.

Mwerer, *Syzygium cumini* (L.) Skeels medicinal trees in the Myrtaceae grew in Kitti by the Nanpei Church and cemetery. Mills Santos informed us that his grandfather Nanpei brought the seeds from Hawai'i and broadcast them in Rohn, Kitti. This large, medicinal evergreen tree's native range is Tropical and Subtropical Asia to North Queensland, Australia. It is widely cultivated in Asia, Africa, and South America and has become naturalized. The sweet and sour ellipsoid or subglobose fruit, seeds, leaves, and bark are reported to have antidiabetic, antioxidant, and anti-inflammatory properties due to various biologically active phytochemical compounds. The astringent and nutritious fruits can be eaten raw or made into jams, jellies, preserves, vinegar, wine, and other fermented beverages.

Kirekiniwel, *Syzygium stelechanthum* (Diels) Glassman is an endemic woodland tree in the Myrtaceae with very dense hardwood (Balick 2009:454), white flowers, and edible cauline red fruits. The berries have been taken along on mountain trips by Pohnpei native people (Glassman 1952:2, 62). Its native range is the Caroline Islands of Micronesia.

Isidro Alfonse spoke of growing *Vitis vinifera* L. in the Vitaceae on Pohnpei. *Vitis* was formerly

grown on Pohnpei for its fruit during the German occupation. The vine was introduced from California (Balick 2009:512; Ragone et al. 2001: 324), and wine was produced from the green grapes.

Raphael Alfonse grew an abundance of delicious *Passiflora edulis* Sims fruits in the Passifloraceae. The sweet and tart aril and seeds of the *Passiflora* fruit are eaten or made into a beverage. The fruit is cut in half, and the aril and seeds are scraped out and consumed or placed in water as a refreshing drink (Balick 2009:459; Ragone et al. 2001:318). With great enthusiasm, I recommended that he bring his wonderful fruits to market. The native range of this herbaceous perennial climber with beautiful solitary flowers is Brazil to Northeast Argentina.

Neolamarckia cadamba (Roxb.) Bosser is an economically important medicinal, tropical tree in the Rubiaceae. It has simple, smooth oppositive leaves, a capitate globose inflorescence and 5-merous fragrant flowers with partially exserted stamens. The drupaceous fruit is glabrous and edible. The buds and leaves smell like wintergreen, and the seeds are dispersed by bats. Its native range is South China to Tropical Asia, and it has been planted to rehabilitate degraded, deforested land in Sarawak. This deciduous tree was growing by the river across from the Pwunso Botanical Garden on Pohnpei.

Kehamwise, Kasik, *Vitex trifolia* L. subsp. *trifolia* in the Lamiaceae is a medicinal, ornamental shrub or small tree with smooth bark and fragrant purplish to blue flowers. The Kapingamarangi people use it to keep mosquitoes away. The aromatic leaves are burned and placed around the house in the evening (Balick 2009:412).

Ngih, *Pemphis acidula* J.R.Forst. & G.Forst. is a medicinal shrub or small tree in the Lythraceae with simple and entire opposite leaves, flowers containing hypanthia and reddish capsulate fruits. It grows among the ni oaroahr, strand vegetation on Pohnpei, and the basaltic islets of Micronesia. Its durable wood is used for house posts, rafters, spears (Glassman 1952:25, 58), tool handles, and utensils and is considered the strongest tree on Pohnpei. The bark scrapings treat dysentery and ulcers (Balick 2009:421-422). The Kapingamarangi people use the dense, hard wood of kini as a wedge. Its native range is Somalia to Mozambique and the Pacific.

Ikoik, *Cordia subcordata* Lam. is a medicinal shrub or small tree in the Boraginaceae with alternate leaves and beautiful, fragrant orange flowers made into mwaramwar and added to nih, *Cocos* L. body oil for its lovely scent. Its ripened fruit, which is a nut is eaten as food, and the leaves and bark are employed in healing (Balick 2009:341-342). The handsome dark-grained wood of lakaume is used for carving by the Kapingamarangi people. House posts and furniture are made from ikoik wood. It grows along the ni oaroahr, strand vegetation on Pohnpei, and the basaltic islets (Glassman 1952:20-21, 25). Its native range is South Somalia to Northern Mozambique, the Indian Ocean, and the Pacific.

On June 12, 2011, plant veterinary medicine with utun-we-usel, tikap, *Musa textilis* Nee

(Balick 2009:285; Glassman 1952:106) fiber in the Musaceae were applied to Mauka, the pup's swollen leg and distended bleeding abdomen. Sounwini Lepen Lison Leon Aldis prepared frozen healing plant medicine, and this compress was placed on Mauka's swollen leg and distended bleeding abdomen. Mauka tolerated the treatment quite well and licked some of the plant medicine. *Musa textilis* Nee was introduced on Pohnpei during the Spanish and German occupations for its excellent fiber. It is now naturalized there, and while the fruit is inedible, the succulent petioles are a water source (Ragone 2001:317; Balick 2009: 285; Glassman 1952:106).

Figure 21. *Microsorum scolopendria*

Thankfulness to the Plants and the Healer

Honorable Pohnpei traditional healer Sounwini Lepen Lison Leon Aldis, prepared a mixture of healing plants for my injured wrist. He gathered four buds of kolou, *Hibiscus tiliaceus* L. in the Malvaceae, four fronds of kideu, *Arachniodes aristata* (G.Forst.) Tindale in the Dryopteridaceae, which is added for sweetening local medicine and to "make the insides good." The new fronds of kideu taste sweet (Balick 2009:233). Four fronds of *Microsorum scolopendria* (Burm.f.) Copel. in the Polypodiaceae is another fern he gathered called kideu, which grows in the naniak, mangrove forest (Glassman 1952:23). The naniak, which encircles and protects Pohnpei, is in swamps affected by ocean tides and contain saline or brackish water (Balick 2009:8).

Sounwini Lepen Lison Leon Aldis collected four leaves of the slender perennial trailing vine, sonsol, Ipomoea pes-caprae (L.) R.Brown subsp. brasiliensis (L.) van Ooststroom in the Convolvulaceae, which grows among the ni oaroahr, strand vegetation where the sandy land rises from the water, along the rocky shore. These plants experience salt water, drying, high winds, heat, and full sunlight (Herrera et al. 2010:2; Balick 2009:9; Glassman 1952:25). Lepen added four nih, Cocos nucifera L. roots to this mixture.

Sounwini Lepen Lison Leon Aldis prepared four buds of rehdil, Asplenium protensum Schrad. in the Aspleniaceae, four buds of kolou, Hibiscus tiliaceus L. in the Malvaceae and four buds of omp, Ipomoea littoralis Blume, in the Convolvulaceae. On Pohnpei, a poultice is made of omp leaves rubbed together with nih, Cocos oil poured over them for treating boils. The poultice is applied to the boil as a plaster and repeated when the leaves dry and fall off. To reduce stress, four young shoots of omp are chewed and swallowed each morning for four to eight days (Lee et al. 2010:45, 102).

Sounwini Lepen Lison Leon Aldis and his lovely wife Lampein Leilani provided me with a poultice of these plants for massaging my injured arm. The soothing mucilage of kolou, Hibiscus tiliaceus L. is very useful for its gliding quality mixed with the other medicinal plants for healing. I returned to his home for four days. Sounwini Lepen Lison Leon Aldis gave me the root of nih, Cocos nucifera L. to ingest with a piece of upw, Cocos "meat".

Sounwini Lepen Lison Leon Aldis told me to return after the four days of treatment if my injured arm was not healed. A few weeks later, my arm needed stronger medicine and protection. Therefore, I returned on May 29, 2011. Sounwini Lepen Lison Leon Aldis requested that I return lakapw (tomorrow) for treatment.

On May 30, 2011, Lampein Leilani first welcomed me when I returned and anointed my body with fragrant nih, Cocos nucifera L. oil. The oil was applied from head to toe. Lampein Leilani's strong and skillful hands were very warm as she gently massaged my arm with natural floral fruit essence and nih oil.

I was given a soothing treatment of a healing umwulap, steam inhalation under a light sheet. A hot bucket of steaming plant medicine steeped in the bucket like a small healing volcano. The bucket was placed beneath my legs, and I placed my injured arm over the heat, which was very comforting. I remained under the sheet in the healing umwulap for about thirty minutes breathing in the vapor of the healing plants.

My diagnosis at Pohnpei State Hospital was ulnar nerve damage, and Dr. Joel provided me with a sling on May 30, 2011. Neuropraxia, peripheral nerve injury, would require 3-6 months to heal. Lamentably, the large woman who attacked me continued to harass me and photographed me against the orders of the President of the College of Micronesia. I informed Sounwini Lepen Lison Leon Aldis that the father of the woman who attacked me had recently died, so she returned home and left the island. It was a comfort that she was not on Pohnpei; however, I felt sorry for her pain and loss.

On June 2, 2011, after drinking a cup of bitter medicinal plants tea, Sounwini Lepen Lison Leon Aldis prepared a bucket of steaming leaves and stems of the four plant species arranged in a mwaramwar, garland for the umwulap treatment. After thirty minutes under the sheet, Sounwini Lepen Lison Leon Aldis and I spoke together. He informed me that the healing medicine is prepared in the latter part of the day at sundown. "This is when the power of the good medicine returns." Koht, God (Rehg and Sohl 1979:173) gave Sounwini Lepen Lison Leon Aldis this gift. We offer sakau, Piper methysticum G. Forst. as a way to honor the spirits of the plants and as an acknowledgment of their healing power. He added sakau (ava) is also prepared in Samoa.

One heals because of one's belief in God. It is not just the power of the plants. It is the goodness of God who has endowed Sounwini Lepen Lison Leon Aldis with this ability and the love of people. He performs treatments in the evening because this is when the power of good medicine returns. "There is evil in the daylight hours."

Sounwini Lepen Lison Leon Aldis relayed a story about nih. The coconut was split on a reef,

and a woman from the west chose the part with the eyes. The other half was selected by a woman of the east.

Sounwini Lepen Lison Leon Aldis and Lampein Leilani's medicine is strong and good. It gave me strength, and I could sleep deeply through the night. On June 3, 2011, I returned to drink a bitter tea and young nih, Cocos nucifera L., with the prepared plant medicine for protection. Traumatically, I felt the attacker's hand around my arm this morning when I awoke. It was still quite painful. I would try to rest my arm and to be moderate at work until it is healed. I was in good hands with Sounwini Lepen Lison Leon Aldis and Lampein Leilani.. Safe.

For eight days, I returned for treatments. Sounwini Lepen Lison Leon Aldis prepared and gave me a bitter tea containing kideu, Arachniodes aristata (G.Forst.) Tindale in the Dryopteridaceae, and Microsorum scolopendria (Burm.f.) Copel.in the Polypodiaceae with young nih, Cocos nucifera L. There are several plant medicines used in this admixture for tea. The tea and steaming plants have a positive effect on aiding in deep sleep and rest. Still, the pain sometimes awakened me at night.

Sounwini Lepen Lison Leon Aldis emphasized that the medicine from the plants must be accompanied by thankfulness and prayer to God and the spirits of the plants for the healing to be effective. On my last day of treatment, I gave an offering of sakau, Piper methysticum G. Forst. to the spirits of the plants for giving their medicine. After sundown is when the plant medicine is most effective. Its goodness returns. One must believe in the healing power of God for the plant medicine and healing treatments to be effective. At the home of honorable Sounwini Lepen Lison Leon Aldis and Lampein Leilani, the dear children and family, patients, and friends all contribute to a loving, healing environment. Lucky, the sweet puppy lay beside me just outside while I was under the sheet with the steaming plant medicine of the umwulap. The bucket of steaming plants caused sweating and clearing, and the moist warmth on my injured arm was soothing. Lucky playfully nipped at me through the sheet. His playful happiness was a comfort that contributed to my healing.

Kau is the untwisting of the nerves that damaged, compressed and impacted my arm. Nih, Cocos nucifera L. and other plant medicine in the young coconut clears this. My arm felt lighter and clearer after this drink, which I took after consuming the bitter tea of kideu and other plants. Sounwini Lepen Lison Leon Aldis gave me exercises to perform in the morning to heal my arm. We drank sakau, Piper methysticum G. Forst. together to commemorate Sounwini Lepen Lison Leon Aldis for his healing gifts, and we also gave thanks to the spirit of the plants for giving their medicine. I returned in the evening with sakau from Awak, which is considered the best on Pohnpei.

June 6, 2011, was my final treatment with Sounwini Lepen Lison Leon Aldis. I presented him with four bottles of fine quality sakau, Piper methysticum G. Forst. from Awak. Kroan Augustine Primo delivered them even amid yet another funeral in his family. Peter, Sounwini Lepen Lison Leon Aldis' brother, and several other men ceremonially prepared the roots of a

ten-year-old sakau, Piper methysticum plant from Awak, and we drank it together. I gave blessings of gratitude to Sounwini Lepen Lison Leon Aldis and Lampein Leilani and the spirit of the plants for healing. I thanked all who were present for their work and love. I would miss nightly treatments at Sounwini Lepen's home. It is dynamic, warm, and loving with the beauty of the children and the kindness of family and friends.

Sounwini Lepen Lison Leon Aldis instructed me to apply the fragrant nih, Cocos nucifera oil before leaving the house for protection. The woman who attacked me was to return to Pohnpei on June 16, 2011.

Sounwini Lepen Lison Leon Aldis recommended planting kehp, Dioscorea Linnaeus in the Dioscoreaceae when there is a full moon. The vine is trained from right to left as it climbs for support toward the sun. On Pohnpei, kehp is the most significant root crop, and knowledge of its cultivation is surrounded by great secrecy. It is a seasonally cultivated crop on Pohnpei, and one must never plant kehp on rainy days or when one is ill or feeling weak as it is believed that this could be transferred to the yam itself (Raynor et al. 2009:40, 44, 52).

Sounwini Lepen Lison Leon Aldis likes to view the lay of the land from the hillslope to the sea. His memory is a blessing.

Chief of Public Health and Preventive Medicine, Dr. Rally Jim once said that "After a funeral, there is a sun shower. It is a way for the departed to say goodbye to their family members."

Isipahu, King Hebel of Madolenihmw told us that Nan Madol was built in 1160. It is the dwelling place, burial site, and temple of his ancestors. Isipahu is deeply concerned about the possibility of the Pohnpei Government's proposed casino development with a Chinese corporation in Madolenihmw, Pohnpei.

Figure 22. Pacific Ocean

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Dr. Amy Eisenberg teaches at the University of Arizona and is an Associate Scholar with Center for World Indigenous Studies. Amy is a scientific artist whose work is in the Hunt Institute for Botanical Documentation and has been exhibited internationally and nationally. She is a steward in the Tohono O'odham Haki:dag - sacred homeland of the Tohono O'odham Nation, and a botanist, ethnoecologist, organic sustainable agriculturist and agroforester. Amy was Licensed Researcher with the Hopi Tribe – Cultural Preservation Office on the International Repatriation of Hopi and Pueblo Human Remains and Sacred Funerary Offerings, which were taken from Mesa Verde and exported without permit or permission. They were in the National Museum of Finland since 1909 and came home in September 2020 for proper and rightful ceremonial reburial back in Mesa Verde where they were once laid to rest.

Amy was International Conservation Liaison and Research Fellow for Yu Shan National Park and Professor at Yushan Tribal College, Formosa. Amy was Earth Island Institute Director of Conservation in the Yaeyama Islands of Japan. Amy conducted participatory research with the Aymar Marka (Aymara Nation) in the Andes of Arica y Parinacota, Chile through USAID and the International Cooperative Biodiversity Group Project. Amy was Agriculture and Community Development Cooperative Research and Extension Agent at Northern Marianas College and Organic Sustainable Agriculture and Agroforestry Researcher at the College of Micronesia. As International Expert at the Research Institute of Anthropology and Ethnology and Visiting Professor in the Department of Biology and Environmental Sciences, Jishou University in Xiangxi Tujia – Miao Autonomous Region of China, Amy conducted collaborative UNESCO-LINKS UNPFII UNDESA research with the Kam people of China and ministries responsible for ethnic development.

Moroccan Anti-Atlas Amazigh Children's Play and Toy Heritage in a Developmental and Intercultural Perspective

By Jean-Pierre Rossie

ABSTRACT

The author wants to promote the recognition of Amazigh Anti-Atlas children's culture and other North African and Saharan children in the countries where they live. As part of the heritage of humanity, children's cultures have great developmental and pedagogical potential for intercultural and pedagogical activities locally and in a Western and non-Western context.

As a sociocultural anthropologist and after fieldwork in 1975 in the Tunisian Sahara, I concentrated on children's play, games, and toys in the Sahara and North Africa. From 1992 until 2000, this research took place in central Morocco among Arabic-speaking and Amazigh-speaking families. Since 2002, I have been among Amazigh (Berber) children living in the Western part of the Anti-Atlas Mountains.

The goals of the author's research and writing are to record, archive, analyze, and distribute written and visual information on Saharan and North African children's toy and play heritages and documenting their evolution. This article and the author's research are intended to promote awareness for, interest in, and the use of children's culture, especially their play, games, and toys in this region and worldwide. The author's research recognizes children's rights and the vital role of children as active participants in the society they grow up. Finally, this article seeks to stimulate the integration of North African and Saharan children's cultures into humanity's tangible and intangible heritage.

Keywords: Amazigh, child, development, intercultural, play, toys

Recently, the ethics of the research on and with children became an urgent topic. Wanting to observe and photograph young children during play, an ethnographer will get a quick reply, "they relate, or they withdraw." Participant observation is impossible without being trusted by the children, their families, and the neighbors. They feel respected and appreciated when seen as valuable informants and producers of objects and knowledge. I obtained permission for research on children from mothers, fathers, or other adult caretakers. The interested

reader can find more details on this research's ethical and methodological aspects in a recent publication (Rossie et al., 2021, 454-465).

In this article, I will not describe the games and toys of the concerned children. However, this is no problem as this information is available in several books of the collection Saharan and North African Toy and Play Cultures (Rossie, 2005-2013), a series of toy catalogs (2015-2016) and in the article Amazigh Children's Toys and Play Cultures all available on the Internet.

The second section discusses three topics related to playing and toy-making of Amazigh children: toy-making materials and techniques, relations between children and between children and adults.

The third section looks at the role of local play and toy activities from a developmental perspective. In Anti-Atlas rural communities, children often live in multilingual and multicultural environments, speaking Tashelhit but learning Moroccan Arabic from a young age. Moreover, the media, tourism, and importing foreign objects and ideas promote a multiculturally vibrant environment. Three topics are discussed:

- the local play culture concerning the development of children, families, and communities
- the influence of sociocultural change
- the situation of local children's culture within the Moroccan school

The fourth section refers to an academic field of growing importance, intercultural and global education. It proposes concrete examples of using Moroccan and Tunisian Sahara children's play and toy-making activities in some Western and non-Western countries. These workshops aim to stimulate insight, empathy, and creativity and show the richness and creativity of children living in African rural areas and popular quarters of towns. This positive image of African children gained by seeing and experiencing their toys and games contrasts with the negative image shown in the media.

Finally, I put forward some concerns about the future of Moroccan children's play and toy-making activities. These views proceed from my conviction that play and toy-making activities can have a decisive role in North African children's development and promote an intercultural understanding of a global level.

Amazigh Children's Play and Toys

Describing Amazigh children's play and toys living in the Anti-Atlas Mountains is not feasible here, but it is easily accessible on the Internet. This section discusses the cultural and social aspects of Moroccan Amazigh children's play and toy culture. These aspects are materials and techniques for toy-making, the relations between children and between children and adults in play and toy-making. *In Toys, Play, Culture and Society*, the same topics are analyzed in detail for Saharan, and North African children (Rossie, 2005/2013, 19-80, 117-136) and especially about Amazigh Anti-Atlas children in *¨Make-believe play among Amazigh children of the Moroccan Anti-Atlas* (Rossie et al., 2021).

It is not an exaggeration that Anti-Atlas children experience and learn most about their natural, animal, and human environment through their play and toy-making activities. They use material of mineral origin (sand, stones, clay), vegetal origin (cactus, leaves, flowers, reed, branches, fruits, nuts), animal origin (bones, snail shells, hair), and human origin (hair). Moreover, they are specialists in re-using all kinds of waste material. The child's and a playmate's body also becomes a self-evident means of playing.

In Moroccan rural areas in general and in the Anti-Atlas, children's leisure activities are often outdoor and collective activities. In these regions and from about three years onwards, playgroups become next to the family, the primary social organization for children. Mixed playgroups with girls and boys up to about six years old are regularly playing under the supervision of an older girl, exceptionally of an older boy, whereby the young ones engage in parallel or collaborative play. What young children experience and learn through their playful relations with same age or older children is without any doubt of fundamental importance in the development of their lives and the relationships they will build out as adolescents and adults. Moreover, these relationships significantly influence socialization, cognitive and social functioning development, communicative skills, convictions, morality, and beliefs. In playgroups, it is in these children's societies that girls or boys learn most games, venture to make toys, integrate the rules managing playgroups and those underlying gender differences, learn the non-verbal and verbal child culture, and so on. Situations of informal learning regularly occurred when making observations.

At about six years, children progressively escape the control of an older child and start organizing their playgroups with peers, although there can be quite some age difference. The composition of these groups is based on kinship and neighborhood, something that strengthens the cohesion between its members. From that moment on, comrades of age become an essential reference group, and long-lasting friendships are built that may continue into adolescence and even adulthood. Although mainly composed of same-sex children, mixed groups can occasionally be found.

Amazigh children's play is intimately linked to the real world where they grow up, and the author has not documented play unrelated to reality. Therefore, it is sure that young children learn much about their natural and human environment through the games they play and the toys they make. Nowadays, one may find imported dolls, robots, and soft toy animals in villages, referring to an unreal world. However, when children play with these toys, it almost always refers to a natural person or animal. Another aspect of the real world typical of these children's outdoor play is a confrontation with risk and risky behavior. Something Western children are lacking when their parents strive toward a 'zero risk' situation. Research on young children's play and toy-making activities in the Anti-Atlas show these activities mainly take place in a friendly, positive, and cooperative atmosphere. Nevertheless, one should not idealize

these playful relations because they are not always harmonious, cooperative, and conflict-free.

A particular aspect of adults' reaction to children's play and playgroups is that they rarely interfere except when the children disturb them too much, need help, or when a dispute or other situation becomes dangerous. However, the fact that adults rarely interfere in children's play and toy-making activities does not mean that the adult world is absent from the children's play world. On the contrary, children's games enact mothers, fathers, grandparents, other family members, teachers, workers, traders, singers, musicians, and other individuals. This children's interpretation of adult life promotes the transmission of the lifestyle of older generations and the keeping up of the existing sociocultural system. Doll play and other rural children's make-believe games relate, with few recent exceptions, to an idealized version of local adult life. For example, the dolls often represent socially valued characters in locally enviable situations during wedding play. The fact that many toys and games their rural parents and grandparents played are still played by their children and grandchildren proves that intergenerational communication is going on. However, the influence of change is growing fast. Nevertheless, this transmission is much more based on contact between older children and adolescents with younger children than between adults and children.

There is one period in the year when Moroccan parents and other adults traditionally offer children toys, sweets, and new. Ashura is a ten-day feast at the beginning of the Muslim year. Less important periods when children may receive gifts are the Mussum, the yearly village or town feast with its fair and popular festivities, and the Mulud, the anniversary day of the Prophet Muhammad. On these occasions, adults sometimes make a toy for a child. Nowadays, an adult might buy a toy when visiting a village or town market. Children's anniversaries often pass unnoticed, at least among popular class families in rural areas. However, change is going on, among other factors stimulated by the anniversary feasts on Moroccan television.

In general, most adults are indifferent to children's play and toy-making. This detachment exists in Anti-Atlas families and among preschool and primary school teachers. The lesson schedule in preschool and primary school classes offers almost no time to play. This situation is the case for the expensive private preschools, one-class preschool schools run in a garage or a home, and the private and the official primary school.

Play and Toys in Child, Community, and Education Development

In this part I want to promote the study, recognition, and use of local play activities and toys in the development of Moroccan children, their families, communities, and the educational system teaching these children.

The Child, it's Family and Community, and the Indigenous Play Heritage

We should view the role of play and toy-making activities in the development of Moroccan children through a holistic approach to girls and boys within their natural, material, cultural and social milieu. The age of the children under

discussion goes from three to fifteen years of age. In villages and rural centers, they mostly live in multicultural and bilingual or multilingual environments, especially when their mother tongue is an Amazigh language. Already in preschool but entirely in primary school, the teaching language is Arabic, and basic knowledge of French is taught. A particular situation occurs when some parents and other adult family members speaking an Amazigh language decide to use Moroccan Arabic with their children, arguing that this will offer them a better start in primary school. But even in such cases, children are impregnated by the Amazigh culture and language of their families and playgroups. In this context, it is necessary to mention the importance of the children's mother tongues as expressed in UNESCO's International Mother Language Day (Heugh, 2017). In the Anti-Atlas, the toy, high tech, and entertainment industries, the media and tourism, together with many imported items, all influenced by Chinese, Egyptian Arabic, English, and French languages, and cultures, stimulate the integration of foreign cultural and linguistic entities.

International organizations promoting the development of children and stimulating a locally adapted educational system put forward the following principles:

- Respecting local child and family identities and cultures.
- Relating actions to the family and local environment.
- Using young children's mother tongue.
- Involving children in their development.
- Stimulating children's resilience.
- Helping children develop physically, socially, emotionally, intellectually, and morally through playful activities.

These principles demonstrate the need to respect, study, promote, and use children's cultures in formal and informal education and the strategies of organizations and associations that address children, women, and families. Maybe it is necessary to add to the saying that *children are the future of a country*; another saying, *development that neglects children's participation has no future*. Knowing that play, games, toys, and other forms of entertainment like storytelling, music, dance, and feasts are essential in children's lives, we should recognize them for their great value and utility for an ecologically, culturally, socially, and educationally adapted development.

In the author's publications on children's play and toy-making activities, several cultural and social topics are discussed, such as signs, meanings, communication, rituals and festivities, the influence of gender, child-child relations, child-adult relations, and continuity and change. Two fundamental aspects are briefly analyzed here as they directly relate to education: gender differentiation and the relationship between children. From six years onwards, girls and boys mostly create separate playgroups in which they experience role models and develop an identity in the company of same-sex peers. Nevertheless, one must be cautious with generalizing statements as the gender cleavage can sometimes be overcome, for example, when a girl infiltrated a boys' playgroup by proposing to clean their play area

(Rossie, 2008, 150-151). The doll and household play of Anti-Atlas girls and the toys they make for these games strongly refer to the duties and tasks of rural women: fetching water, molding corn, baking bread, preparing oil, washing linen, and spinning, weaving, and dressing up. In their play, girls exchange information, discuss roles, and experience feelings about womanhood and men-women relations. The make-believe play of Moroccan boys refers mainly to jobs and tasks of adult men in construction work, farming, and trading (Rossie, 2008) or to being police officers, soldiers, vehicle drivers, and technicians (Rossie, 2013). Playing with peers and somewhat older girls or boys certainly promotes the transmission of information and the discussion of viewpoints.

The play environment of little boys and girls usually is limited to the space adults can oversee (fig. 1). Older children like playing at some distance from home (fig. 2). A distinction must also be made between boys and girls, as boys enjoy more freedom and time to play than girls. Older boys are sometimes found kilometers away from home. Older girls must stay closer to home,

Figure 1. Sisters' household play, eighteen months and three-years-old, Ighrem-n-Cherif, Morocco, 1994, photo by the author (Rossie, 2008, 116).

be available to help a mother or look after small children and remain under tighter control.

Figure 2. Boys' percussion orchestra on the road to the harbor, 2005, Sidi Ifni, Morocco, photo by the author (Rossie, 2013, 249).

During the day and evening, children from about three years spend a lot of time outside their homes. They often group themselves in small children's societies based on family and friendship ties according to age. Toddlers mostly remain under the control of a girl or even a boy six years or older. From the age of about six years, mixed groups concerning sex and age become differentiated in girl groups and boy groups, and it is then that peers become an essential reference. These playgroups have great importance in the holistic development of children. Outside the home and in interaction with youngsters, children learn most games and venture to make toys, many linguistic and other skills are trained, and child culture is transmitted. Moreover, they socialize to the rules that manage relationships between peers and younger and older children or girls and boys. Undoubtedly, the knowledge, experience,

and skills acquired outside the home and in playgroups offer a valuable resource that any development action and teaching must consider based on the indispensable respect for the child's culture and sociocultural environment.

In *Rural Moroccan Children's Play and Toys in Multicultural and Multilingual Environments*, the reader will find a discussion on different social and interpersonal aspects, cultural and linguistic aspects, individual aspects, and material aspects based on a detailed analysis of three long videos made in 2002 in and around Sidi Ifni (Rossie, 2003, 6-16).

The Influence of Economic and Sociocultural Change

The times that rural Amazigh children grew up in isolated villages, rural centers and monolingual and mono-cultural communities are gone for long. Since then, the change from tradition to modernity has proceeded consistently quicker. These youngsters nowadays live in multicultural and multilingual environments. The recent high-tech products, like smartphones, Facebook, and WhatsApp, are seldom unknown to primary school and even some preschool children. Therefore, it is inadequate to study these children's play and toy heritage as belonging only to tradition while neglecting the evolution play practices and toy-making have undergone (Rossie et al., 2021, 446-453).

There was enough evidence to support the claim that Anti-Atlas girls' play, and toy-making activities remained linked to tradition for a longer time than was the case for boys who quickly integrated technological innovations. However, one can no longer uphold this statement as it is contradicted by girls' make-believe play referring to daughters of emigrants, European female tourists, and Egyptian belly dancing. New interests and concerns are also expressed like modern health care, the situation of disabled persons, going on holiday, and migration. Moreover, making dresses for their second-hand plastic dolls inspired by Moroccan and European fashion is becoming popular among rural girls (Rossie et al., 2021, 446-454).

A long-standing and significant factor in the evolution of rural children's play and toy heritages is related to the desertion of the countryside. A substantial change in children's culture occurs when a family leaves its village and settles in an urban environment or when a town expands its perimeter by urbanizing neighboring villages. When this happens, not only the available play areas and materials change but also the socio-cultural references, so crucial in make-believe play. The establishment of primary schools and so-called preschools and the growing enrolment of girls in these educational institutions also play an essential role.

The growing influence of globalization on children's culture, especially their play and toy heritage, relates to several factors. It becomes more challenging to observe rural children making toys primarily because of the massive import of toys made in China and second-hand toys imported from Europe. For one or two decades, this situation combined with a fundamental change whereby children receive industrially produced toys on market days and during festivities like the popular *Ashura and*

Mulud feasts. Nowadays, parents and other family members may also give toys to a child for its birthday. All this offering of toys to children promotes an attitude whereby making toys oneself becomes obsolete, and toys increasingly are expected to be gifts from adults (Rossie, 2005/2013, 130-131).

Television, Smartphones, and digital video media bring Anti-Atlas children in contact with the way people eat, dress, play, go to school, travel, and celebrate in different Moroccan regions and other countries. Watching movies, videos, and comics from the United States, Brazil, Egypt, England, France, Japan, and Mexico exposes them to new cultural and linguistic influences.

European tourists and tourists of Moroccan origin living abroad directly and indirectly influence the ideas and behavior of Amazigh children. This indirect influence is seen in recent girls' doll play (fig. 3).

Figure 3. Doll play about French tourists at the beach, Douar Ouaraben, Morocco, 2006, photo Khalija Jariaa (Rossie et al., 2021, 106-108).

Notwithstanding the reality of the evolution of Anti-Atlas children's play heritage away from tradition and towards modernity, many play and toy-making activities popular in the times of parents and grandparents are still found regularly in rural communities. However, it remains to be seen what the result will be in one or two decades of the recent changes introduced by the toy and entertainment industries and by high-tech innovations. Nevertheless, evolution did not create much conflict between the old and the new at the beginning of the 21st century.

The Moroccan School and the Local Play Heritage

Parents and educators should integrate child culture in general and especially the local play and toy heritage into developing an adapted formal and informal education. The reader will find a more advanced analysis of examples of using children's play and toy heritages in developing countries and of the situation in Moroccan preschools and primary schools in two publications (Rossie, 1984, 2011).

The strategy stipulating pedagogical actions should relate to children's experiences is clearly stated in the Moroccan *Charte Nationale d'Education et de Formation* (1999). In translation from French, article 3 reads as follows: the educational system is rooted in Morocco's cultural heritage. It respects the variety of its regional components that enrich each other, and it preserves and develops the specificity of this heritage in its ethical and cultural dimensions. Article 6 says that achieving the objectives requires considering children's psychic,

affective, cognitive, physical, artistic, and social expectations and needs.

The first article of the *Loi n° 05-00 Relative au Statut de l'Enseignement Préscolaire* (2000) states that preschool education should guarantee all Moroccan children the full equality of chances facilitating their physical, cognitive, and emotional development and developing their autonomy and socialization. Referring to this wish to preserve and develop the specificity of the Moroccan cultural heritage through education, one can stress that play and toy heritages should be used to entrench the education system in local realities.

Formal and non-formal education can benefit significantly from a well-considered use of play, games, and toys. If this is true for the Moroccan school, it is even more so when education must adapt to Amazigh children enrolled in preschool or primary school. Talking with children about their play and toy-making activities will establish a positive relationship between teacher and child and reduce the gap between child culture and family environment. It is indicated to start from the knowledge children acquired about their natural and human environment to teach lessons about these topics. This information gathered from children can also be used to develop moral, aesthetic, and physical education activities. The verbal component of games, such as specific words and expressions, riddles, dialogues, and songs, represent a gold mine for the development and learning of language. Physical education teachers, can include several games of skill-development dexterity, equilibrium, suppleness, speed, strength, and self-control in the curriculum (Rossie, 2011, 15-16). Suppose one wishes to use the local play heritage. In that case, one should not only be interested in the content and form of games but also in their physical, material, technical, linguistic, aesthetic, and moral aspects.

The *Alliance de Travail dans la Formation et l'Action pour l'Enfance* is a non-profit and non-governmental organization founded in 1986 at the University of Rabat. Among the fourteen fundamental principles of its educational vision, at least four are directly related to the eventual use of children's local play and toy heritage:

1. Starting from the child in preschool activities.

2. Exploiting the pleasure of playing as an educational tool

3. Opening to the child's environment and using it pedagogically.

4. Working in small groups.

Concerning working in small groups, teachers should recognize that children are familiar with this situation because of their involvement in children's playgroups. The author is convinced that researching spontaneous playgroup dynamics will help develop an adapted preschool pedagogy.

An evaluation study initiated by the Moroccan Ministry of Education and UNICEF offers a diagnosis of the preschool establishments by analyzing the current situation, comparing it with preschool systems in some Developing and Developed Countries, and offering realistic proposals for ameliorating the preschool in

Morocco (GEF, 2014). When discussing the role of play activities in the preschool of other countries, this study stresses that all analyzed models show that children's play activities are fundamental (7-8). Still, it also states that play is not a priority in about 80 % of the Moroccan preschools, contrary to reading and writing (13). In the conclusions of this study, one reads that a significant obstacle to creating a high-quality and generalized preschool education in this country comes from the lack of a preschool vision proposing curricula based on educational principles. It also mentions that learning through play should be a pedagogical priority (17).

I would emphasize that a change in mentality in preschool education recognizing the socio-cultural and educational value of local play and toy heritages in Morocco and other North African and Saharan countries is necessary. It needs to be complemented with campaigns to change parents' ideas about this new strategy. A member of ATFALE wrote that teachers and parents display a negative attitude towards play and toys in school. This situation creates an essential obstacle to the modernization of preschools, also because parents sometimes expressed reluctance at paying for their children to play in the Qutab [koranic school]" (Bouzoubaâ, 1998, 16).

Using local play heritage from an intercultural and educational perspective

From an intercultural and global education perspective, I discuss this pedagogical field of growing importance, reflecting on my attempts to use Moroccan and Tunisian Sahara children's play and toy-making activities. This use is realized in workshops with children, children and adult family members, pupils, students, teachers in training, appointed teachers, and volunteers. These activities took place in museums, toy libraries, children's libraries, preschools, primary schools, university settings, and sociocultural associations in Argentina (fig. 4), Belgium, France, Greece, and Italy (Rossie, 2005, 219-239; 2013, 262-289; 2016).

Figure 4. Toy creating workshop with pupils and teachers, 2010, Instituto de Formacion Docentes de Bariloche, Argentina, photo by the author (Rossie, 2013, 278-280).

The universality of the major categories of games, such as make-believe play, construction play, games of skill, games of chance, and the toys used in these games, favors a comparative approach. During these workshops, it has been easy to stimulate insight, empathy, and creativity in the youngsters and adults by showing them the richness and creativity of Moroccan rural children's play culture. The positive image of African children transmitted in such workshops contrasts with the often-negative images of

miserable or starving African children shown in the media as if these messages reflect the only reality of childhood in this continent.

In 1992, the author's intercultural activities ended because of his research in Morocco. Still, they resumed in July 2008 when being invited by the Museum of Childhood of the Peloponnesian Folklore Foundation in Nafplion to develop an educational program related to Anti-Atlas children's play heritage. Inspired by toys Amazigh children had made, Nafplion children between six and twelve created their toys during six workshops. These Greek children made masks and dolls with natural and waste materials searched for in the park surrounding the museum. Since then, using natural and waste material to create masks, dolls, and possibly other types of toys such as vehicles has been a recurrent theme in the author's workshops.

Helpful information and activities on Global Education are found on the website *Global Dimension. The world is your classroom and Global Learning Programme*. On the website of Think Global, which manages these, one reads:

> We believe that people need to be equipped with the skills, values, and capabilities for global challenges like environmental sustainability, human development, and conflict resolution. Learning about global issues leads to more tolerance and understanding. This in turn can lead to actions for a better world – which in turn we can reflect on and learn from.

Examples of the role of children's play and toys for global education are found on: https://globaldimension.org.uk/topic/play-and-toys .

Next to organizing workshops or seminars and giving lectures, the author donated about 1200 toys to museums and sociocultural organizations in Australia, Belgium, France, Italy, and Portugal. Except for the about forty toys from Ghrib children of the Tunisian Sahara, all the other toys belonged to Moroccan children. Children made the great majority of these toys with natural and waste material. An extensive and longstanding exposition was built in Torino (Italy) (fig. 5), Moirans-en-Montagne (France), and a smaller one in Safi (Morocco) (fig. 6).

Figure 5. Moroccan consul visiting the exposition Rêves d'Enfants, Torino, Italy, 2010, photo Roos van Wassenhove.

Figure 6. City children at the youth center of the Fondation Orient-Occident, Safi, Morocco, 2009, photo by the author (Rossie, 2013, 262-268).

The primary reasons to offer these toys to Western institutions are the preservation and disclosure of this vanishing children's culture. Among other reasons is the lack of interest of Moroccan cultural institutions in these great toys and their integration into humanity's tangible and intangible heritage. A description of the concerned toys is given in a series of books called *Saharan – North African – Amazigh Children's Toy Catalogs* (2015-2016), available on the Internet.

It is essential to link an *intercultural approach to play*, which fits his research, to a *playful approach to the intercultural*. It is imperative because individual people cannot survive in a multicultural and interdependent world. Survival is impossible if they do not understand the *specificity* of living in one's community and the *universality* of living in other societies. Employing children's play and toy heritages from around the world for educational and socio-cultural activities offers a nonthreatening, positive, and joyful way to relate children and adolescents to other forms of life and the natural and socio-cultural environment in which populations thrive.

And Finally ...

This article started by stating the importance of the cultural and social aspects of Anti-Atlas Amazigh children's play and toy-making activities, stressing that these activities are fully integrated into local natural and human environments. The ethnographic data makes it possible to offer an overview of these children's play heritage. Still, at the same time, one should not overgeneralize the findings to the whole of North Africa. Nevertheless, what may be said about Anti-Atlas children may also be said about other Moroccan Amazigh-speaking and Arabic-speaking children. There is a great need for other scholars' research to augment, validate or invalidate the proposed information.

The sections' Amazigh Children's Play and Toys' and 'The Child, the Community, and the Local Play Heritage' have shown that Anti-Atlas children's outdoor play experiences are important factors in their physical, cognitive, and communicative, emotional, and social development. Moreover, all this occurs through children's efforts and active interpretation, not passive imitation. Moreover, the socializing benefits are rather collateral events because children do not play to become socially adapted or ameliorate skills; they play for the fun and well-being it procures.

Observing children's games and how they make toys, talking with them about their play culture, and considering their playful experiences is an excellent way to integrate children's viewpoints and illustrate children's participation in their culture and community.

Noticing the growing influence of the school, media, toy industry, and high-tech products in the lives of Anti-Atlas children, the author has the feeling that several traditional play and toy-making activities will become obsolete or forgotten in the forthcoming decades. In this context, the Moroccan preschool and primary school could play an essential role by recognizing the value and role of children's play heritages.

Research by Moroccan researchers on this vital aspect of childhood would undoubtedly reinforce the information on local children. Some research on children becomes available through dissertations and theses written at Moroccan universities. Still, their themes are often about negative aspects of childhood, such as abandonment, ill-treatment, exploitation, and delinquency. There is an urgent need for research on positive aspects of childhood, such as creativity, cooperation, and physical and intellectual development. Creating a documentation and research center on children and a childhood and toy museum in Morocco could be a significant step forward, just as has been the case in Argentina, Brazil, India, and Turkey.

The living conditions of Moroccan rural children and those of children living in mass consumption societies show advantages and disadvantages. Both situations must be compared using the Amazigh children's play and toy heritage for intercultural and global education. Ignorance about peoples and cultures in a world where one eats and buys things imported from many 'exotic' nations is a contradiction and stimulates distrust and fear. Luckily children often keep an open mind. Using foreign children's play and toy cultures is a friendly and non-stereotyping approach to childhood in developing countries. In doing so, it is necessary to avoid two pitfalls: On the one hand, idealizing the situation of these children because they create great toys, are masters in using natural and recycled material, and have many playmates; on the other hand, lamenting their situation by looking only at negative aspects such as the problematic sanitary, medical, economic, and educational situation in which these children grow up.

Lester and Russel (2010, p. 52) writes in *Children's right to play. An examination of the importance of play in the lives of children worldwide*:

> Play has an essential role in building children's resilience across adaptive systems – pleasure, emotion regulation, stress response systems, peer, and place attachments, learning and creativity. These benefits arise from play's unpredictability, spontaneity, nonsense, and irrationality, and also from children's sense of control. Adults need to ensure that the physical and social environments in which children live are supportive of their play; otherwise, their survival, well-being, and development may be compromised. This does not necessarily mean providing specific services, although there may be circumstances where this is appropriate. But it does mean avoiding the temptation to dismiss play as frivolous, restrict it through fear for and of children, or control and appropriate it for more instrumental purposes.

I entirely agree with this statement. But I must add that when using children's play, games, and toys for sociocultural and educational purposes, adults must be aware that the children need to remain in charge of the playful activities so that it does not turn into a training exercise. He also

wants to stress that children have an active and essential role in communicating, transmitting, and adapting aspects related to developing individuals, cultures, and societies. Therefore, one should also recognize their contributions next to promoting their rights.

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Sidestepping the Climate Change Juggernaut

The potential for staple crop polycultures and passive solar greenhouse systems to safeguard food security

By Cora Moran

ABSTRACT

Root vegetable polyculture growing practices used alongside permaculture design inspired passive solar greenhouses offer a novel methodology for ecologically benign, efficient staple food crop production. These systems have great potential to address the issue of food security in the face of abrupt climate change and can serve as a tool for magininalized groups such as indigenous peoples to maintain their food security and preserve their botanical heritage, and, in doing so, safeguard the genetic diversity of rare crop species. This paper outlines how these systems can be used for these purposes and advocates further research and field study trials to develop practical methodologies and further theoretical understanding of permaculture inspired polycultures.

Keywords: Climate change, permaculture, polyculture, greenhouse systems

Juggernaut

"A large powerful force or organization that cannot be stopped" (Cambridge University Press, 2021)

Climate change is sometimes described as being like a juggernaut, some great unstoppable monstrosity careening downhill towards us. While it may not be possible to stop it or outrun it entirely, it may be possible to sidestep some of its effects. Climate change is already causing a great deal of disruption in countries around the globe, with extreme weather events becoming more severe and frequent. Perhaps the most vulnerable aspect of society in the face of this though is food production.

Our current predicament and potential strategies for adaptation

Conventional growing methods of field crops are likely to face markedly reduced yields in many parts of the world with abrupt climate change and in many locations may become completely untenable. The current trajectory for emissions may well see a 4 degrees Celsius rise in global average temperature by the end of the

century, which will have profound implications for agriculture globally (Raftery et al. 2017, p.639). In addition to temperature increases, this will lead to more erratic weather patterns with an increasing frequency and intensity of extreme weather events such as droughts, floods, and heatwaves which will substantially affect agricultural yields at a time when there is increasing global demand (The World Bank 2012, pp.43-46). These conditions pose a severe threat to food security globally as grain crops, which are typically grown in vast monocultures and provide a substantial proportion of human caloric needs, are very vulnerable to these changes (John, 2021). For example, 40 percent of global calorie demand is currently provided by only rice, wheat & maize (FAOa, 2018). Climate could lead to 'multiple breadbasket failures', a simultaneous failure of these staple crops in the main grain-growing regions of the world, primarily focused in a handful of nations in the mid-latitudes such as the United States, Russia, and China (Janetos et al., 2017). The risk is already rising year on year and could lead to global food shortages (Rivington et al., 2015).

The main alternative to grains as a plant staple in human diets are root vegetables and tubers (Jones, Martin, and Pilbeam 2007, p.374). Though they often store less well and have higher labor input requirements than grains, they can provide calories in a much more space-efficient way with substantial yield differences per hectare compared to grain crops (FAOb, 1990). Due to their high yield density, they are also easier to grow efficiently in polyculture systems. These systems typically offer greater resilience to pests & higher yields than monocultures (Bracken 2008, pp.2446-2449). There are also several productive root and tuber crops that have traditionally been grown by indigenous peoples (Plants for a Future, 2012) that are currently rarely grown but which have promise to be grown commercially (Neacsu, 2019).

A range of farming methods and new crop varieties such as breeding perennial grains and genetically engineering crops to withstand greater drought are currently being developed to address the risk that climate change poses to food security (Mbow et al. 2019, p.471, 504). One strategy that has been proposed is growing crops in controlled environments such as greenhouses and vertical farms as one of the means via which food production can be maintained efficiently in such an inhospitable future climate (Chang, 2019). While such techniques have value, they typically have high energy requirements and are used to grow luxury vegetable, fruit, or salad crops which are important for human health but only provide a small proportion of global caloric requirements (Chang, 2019).

However, the stable conditions provided by greenhouse agriculture may prove invaluable with declining yields from outdoor growing in many countries in a rapidly changing climate. If greenhouse production can be used with much lower energy requirements than most commercial systems they may also have scope to grow plant calorie crops in the form of root vegetables and tubers. These can be grown much more space-efficiently than grains, which have too low a yield per unit area to be practical to grow at sufficient scale within greenhouse conditions.

Optimal strategies for promoting food security and reducing the ecological impacts of agriculture in the face of climate change

Globally, agriculture is responsible for approximately 11% of the world's total carbon emissions (Center for Climate Solutions, 2019). A range of initiatives such as developing heat-tolerant crop varieties and utilizing no-till growing methods have been put forward to reduce the impacts of climate change on agriculture and reduce agricultural pollution while maximizing labor efficiency and improving yields (Immenschuh, 2014).

Whilst conventional agricultural practices are making progress in improving levels of efficiency and resource conservation while also improving yields (Ritchie and Roser, 2019), less progress is being made with regard to conserving biodiversity (Schwägerl, 2016). Global loss of biodiversity is arguably the other great crisis of our time, interplaying with the effects of climate change. Such losses weaken the resilience of ecosystems, leading to the loss of traditional lifeways and means of subsistence for indigenous peoples around the world and undermines the overall worldwide capacity for food production (Barnosky et al. 2012, p.57).

Alternative methods of agriculture have been developed that put biodiversity at the heart of the system, namely Agroecology; "the application of ecological concepts and principles to the design and management of sustainable agroecosystems" (Tallarico, 2019). There are a variety of methodologies within Agroecology, with the general aim to maintain the high yields necessary for a growing global population while conserving biodiversity alongside general resource conservation and pollution mitigation. 'Biointensive Agriculture', for example, has been shown to provide high yields on a small land area, including assessments within an enclosed environment (Ecology Action, 2010) but requires very high labour inputs to obtain sufficient yields (Nauta, 2012).

Permaculture is a movement that has developed in parallel to Agroecology as a design methodology predominantly focused on food production and can be viewed as a perspective on the design of agroecological systems (Tallarico, 2019). It is a conceptual framework for evaluating and adopting existing methods (Krebs & Bach 2018, p.5) and is a site-specific and context-based design system (Krebs & Bach 2018, p.9). Though currently less well represented in the scientific literature, there is scientific evidence to support the individual design principles in an agroecological context (Krebs & Bach 2018, p.3). It can be defined as "the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems" (Tallarico, 2019).

Permaculture is a design system that was developed emulating patterns and features observed in natural ecosystems; it is based on a series of design principles that provide an accessible methodology for communities to improve their food security (Althouse 2016, p.10). The permaculture concept was co-founded by David Holmgren and Bill Mollison, who put

forward the principles in 1974; these were more clearly defined into 12 principles in 2002 by David Holmgren (Althouse 2016, p.12). David Holmgren's work was based mainly on the work of Howard T Odum, an ecologist whose work was grounded in systems theory (Holmgren, 2003).

The standard 12 design principles were further organized into a design process, initially developed by Althouse (2016) to provide a framework within which they could be implemented when creating design solutions (Althouse 2016, p.72). This framework has also been recommended for use in Moran (2019) and Mempouo & Moran (2019). This framework can be used as a template for creating design solutions and is outlined below:

Table 1: Design Process Using Permaculture Design Principles

Inventory & Analysis	Determine Needs	Functional Diagrams	Concept Design	Final Design
Observe & Interact	Catch & Store Energy	Design from Patterns to Details	Use Small & Slow Solutions	Creatively Use & Respond to Change
Apply Self-Regulation & Accept Feedback	Obtain a Yield	Integrate Rather than Segregate	Use & Value Diversity	
Use & Value Renewable Resources & Services	Produce no Waste		Use Edges & Value the Marginal	

(Althouse 2016, p.28)

Permaculture also has the potential to provide a framework that can be used in a complementary way to traditional ecological knowledge to provide communities with a toolkit from which they can design their systems. As advocated in McCleary & Moran (2019), permaculture guild food forests have the potential to improve the food security of indigenous people in a changing climate. Such techniques can also be used to create guilds in the form of root vegetable polycultures, as proposed in this paper for further research, utilizing ecological principles to maximize yield (Wooldridge, 2016). One such principle is the 'Edge Effect', an ecological principle where there is a "tendency to have greater variety and density of organisms in the boundary zone between communities" (Lawrence 2000, p.183). This principle is utilized in permaculture food forests

which seek to mimic the ecological productivity of a forest edge with plants growing at every level from tree canopy to ground cover, maximizing photosynthetic efficiency and crop productivity per unit area (Crawford 2010, p.29). This principle is noted in the permaculture process's concept design stage above as 'Use Edges & Value the Marginal'.

Such a principle could be utilized for root vegetable polycultures, for example, with crops grown in rows in a semi-circular structure such as a polytunnel oriented for maximal sunlight depending on geographical location. In such a setup, the tallest crop could be grown in the central row, with successively shorter crops in rows on either side to maximize the photosynthetic and space efficiency of production per unit area and grow a healthy diversity of species to minimize pest problems. This approach could also be utilized with standard beneficial practices such as crop rotation with legume polycultures, cover cropping, and other methods to maintain soil fertility alongside rooftop rainwater collection, and other design methods to minimize input requirements. Detailed crop species-specific examples are provided in the 'Case Study Examples' section below. Such a setup could also be used in a triangular shape for a structure, such as the example passive solar greenhouse below in Figure 1:

Figure 1. Passive solar greenhouse (Crook, 2021)

While there are a range of types of greenhouses, they are generally assessed according to their utility as the most appropriate tool for a particular set of growing requirements rather than any one type necessarily being viewed as superior to others. The majority of commercial greenhouses, for example, are large glasshouses that can provide very high yields of commercial crops. They also tend to have high energy costs for heating and cooling them due to the relatively poor insulation values of glass or polycarbonate coverings (Awad, 2012) compared to materials such as earth or brick which are typically constructed with supplementary insulation or features such as internal air spaces (Archtoolbox, 2022). New innovative technologies such as seawater greenhouses are also being developed (Sundrop Farms, 2016).

Passive solar greenhouses also offer great promise as a system to grow food in an energy and space-efficient manner, particularly in the context of climate disruption. In contrast to typical commercial greenhouses in which the walls and roof of the structure are all made of a transparent material such as glass, passive solar greenhouses typically have one or more sides made from an insulator material such as brick (De Decker, 2015). Passive solar greenhouses only use the sun's energy and innovative design solutions to maintain consistent temperatures for plant growth rather than relying on external energy inputs in the case of most commercial greenhouses. As such, they are designed for maximal efficiency, with one famous design being the 'Chinese Solar Greenhouse'. This design has a single exposed side facing the sun and the other sides are made of an insulator material such as brick, with passive ventilation and a cover that can be rolled down over the transparent side. The cover helps to retain heat at night or cool the greenhouse in excessive heat (De Decker, 2015), as can be seen in figure 2 below:

Their minimal energy requirements have even led to their promotion at the governmental level in China (De Decker, 2015); though they are currently not utilized to the same extent in most Western nations, they appear to have great potential as a technology globally.

Their lack of need for fossil fuels, low capital costs, and simplicity of construction have acted as incentives for this technology to be utilized on a large scale. The lack of fossil fuel requirements and low cost are particularly attractive in China where the 'Chinese Solar Greenhouse' design now covers over a million hectares (De Decker, 2015) and could, for example, be scaled up further to grow additional root vegetables as a replacement for declining grain yields. Passive solar greenhouse technologies have also been made use of on a small scale across the globe, being popular in the Permaculture movement and also utilized by the Aymara people of Bolivia who construct 'Walipinis', passive solar pit greenhouses (see Fig. 3 below), in which they can grow crops in highly arid conditions (Ceres Greenhouse Solutions, 2014).

Figure 2. Chinese Solar Greenhouse (De Decker, 2015)

Figure 3: Walipini (Ceres Greenhouse Solutions, 2014)

One of the main methods that such marginalized communities have also used to improve their food security is using permaculture, which is being promoted in many lower-income nations in the world, for example, in Malawi at the Kusamala Institute of Agriculture and Ecology (Kumbali, 2019). Such methods have been advocated for use in permaculture guild food forests to organize climate-resilient agriculture (McCleary & Moran 2019, pp.37-47). Such techniques could also be applied to use the permaculture design principles outlined in Table 1 to provide controlled environment growing conditions for staple root vegetable and tuber crops in structures such as Walipini.

Case Study Examples of Potential Root Vegetable Polycultures

Below is an example of a suite of crops that could be used for such a system using examples of traditional Andean food crops providing a generalizable template for further research. In this instance, being grown in a structure such as a Chinese Solar Greenhouse with the tallest crop species at the rear of the growing area and each successively shorter species being grown in rows in front to maximize efficiency:

- A row of mashua could be grown at the rear on a trellis; mashua is a climbing plant that provides both a leaf crop throughout the growing season and a root crop.
- In the next row forward, potatoes could be grown, as the next tallest crop species, with space between rows for weeding and maintenance.
- In front of this, oca could be grown, another productive tuber crop with a lower growing habit than that of potato.
- Ulluco, a root crop with a very low, spreading habit that is often used as a ground cover for weed suppression (Cultivariable a, 2022), could also be grown in complement with both the potatoes and oca.

Figure 3: Mashua, Potatoes & Oca in sequence (Cultivariable, 2013), (National Gardening Association, 2014), (Moran, 2021)

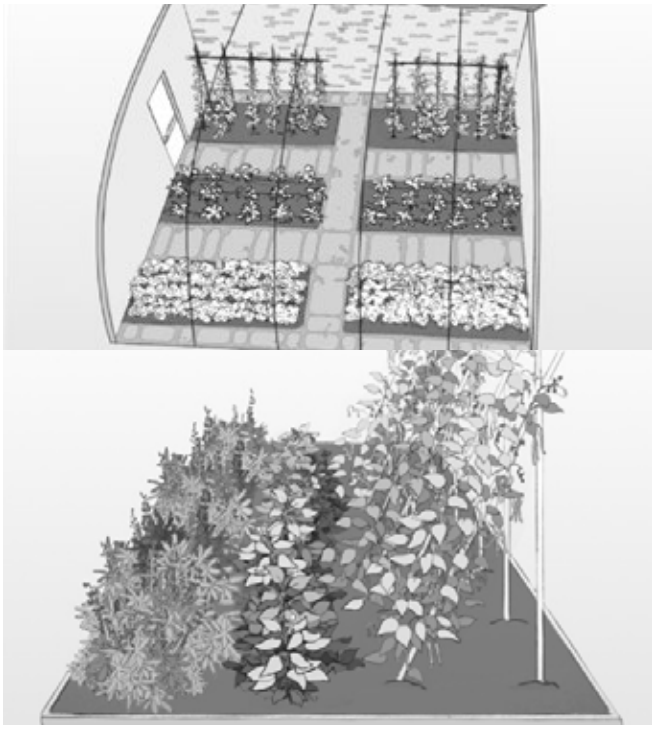
Figure 4: Ulluco ground cover (Cultivariable a, 2022)

This could be grown in rotation with a legume polyculture, alternating each growing season between the two to maintain soil fertility and minimize disease build up:

- Scarlet runner beans growing up the trellis at the rear of the greenhouse in rotation with the mashua, in addition to being a nitrogen fixing legume that produces a protein rich bean crop this species also produces an edible tuber
- A middle row of bush type French beans could be grown
- In the front, Tarwi, an edible lupin cultivated in the Andes could be grown in the front row as the shortest species. This plant produces a seed crop rich in protein and oils in addition to being a nitrogen fixer.

Figure 5: Runner Beans, French Beans & Tarwi in sequence (Gulisano et al. 2019), (West Coast Seeds, 2022), (Royal Horticultural Society 2007, p.2)

A full schematic is illustrated below as to what such a system could look like in profile, showing the two example polycultures in rotation in a Chinese solar greenhouse.



Tarwi, French Beans & Runner Beans in sequence

Oca, Potatoes & Mashua in sequence with Ulluco ground cover

Figure 6: Passive Solar Greenhouse Schematic (Howell, 2022)

The potential of root vegetable polycultures and passive solar greenhouses and scope for further research

This paper proposes an additional strategy to help provide food security and safeguard botanical heritage in the face of the biodiversity and climate change crises. Permaculture merits particular consideration as a set of design criteria as it aims to look at maximum energy efficiency as well as productivity (Bohler, 2017). In the context of staple crop production, this is especially pertinent as labor efficiency needs to be maximized as part of general efficiency. Whilst root vegetable and tuber crop production is space space-efficient, it also still needs to be done at scale, and agricultural labour is at a premium in many locations (Roser, 2019).

As outlined in the framework in Table 1, the permaculture design principles can be applied to crop production itself and the design, construction, and maintenance of structures to enable stable growing conditions in the face of abrupt climate change.

Food production in passive solar greenhouses has the potential to be simple, low cost, and energy-efficient, providing staples at scale in a hostile climate and, as such, merits further investigation. Whether utilized as a complete food nutrition system for a community, for local production of staples in a complementary fashion with other agricultural activities, or for supplementary income of cash crops, root vegetables, and tubers, polycultures in covered growing setups offer great potential. Its simplicity and replicability as a design system based on permaculture principles, with low costs, fast turnaround times and scalability, are also noteworthy for marginalized communities and agriculture.

It should also be noted that while biointensive methods have been investigated within a closed environment, there has so far been a lack of practical testing of such concepts within the context of permaculture (Jeavons 2001, pp.65-76). Such research could, for example, straightforwardly be conducted through multi-season comparative field trials between the indoor and outdoor growing of root vegetable and tuber crop polycultures and between polyculture and monoculture plots of each of the crops under investigation to compare respective yields.

Practical investigations of agroecological polyculture methods and solar-thermal greenhouse systems are required based on permaculture design principles. Both as a case study example of how those communities could safeguard such plants that indigenous peoples use for their benefit, and a more comprehensive application for the production of staple crops to safeguard food security more broadly. As part of a suite of adaptive measures, they may help us to mitigate the risk to food security posed by abrupt climate change and help us to sidestep the juggernaut.

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El Potencial de los Policultivos de Cultivos Básicos y los Sistemas de Invernaderos Solares Pasivos para Salvaguardar la Seguridad Alimentaria

Por Cora Moran
Traducción al Español por Aline Castañeda Cadena

RESUMEN

Las prácticas de cultivo de policultivos de tubérculos utilizadas junto con los invernaderos solares pasivos inspirados en el diseño de permacultura ofrecen una metodología novedosa para la producción de cultivos alimentarios básicos ecológicamente benigna y eficiente. Estos sistemas tienen un gran potencial para abordar el tema de la seguridad alimentaria frente al cambio climático abrupto y pueden servir como una herramienta para que grupos marginados como los pueblos indígenas mantengan su seguridad alimentaria y preserven su patrimonio botánico y, al hacerlo, salvaguardar la diversidad genética de especies raras de cultivo. Este documento describe cómo se pueden utilizar estos sistemas para estos fines y aboga por una mayor investigación y estudios de campo para desarrollar metodologías prácticas y una mayor comprensión teórica de los policultivos inspirados en la permacultura.

Palabras clave: cambio climático, permacultura, policultura, sistemas de invernaderos

Gigante

"Una gran fuerza u organización poderosa que no se puede detener" (Cambridge University Press, 2021)

El cambio climático a veces se describe como un gigante, una gran monstruosidad imparable que se precipita cuesta abajo hacia nosotros. Si bien es posible que no sea posible detenerlo o dejarlo atrás por completo, es posible eludir algunos de sus efectos. El cambio climático ya está causando una gran perturbación en países de todo el mundo, con fenómenos meteorológicos extremos cada vez más graves y frecuentes. Quizás el aspecto más vulnerable de la sociedad frente a este pensamiento es la producción de alimentos.

Nuestra situación actual y posibles estrategias de adaptación

Es probable que los métodos de cultivo convencionales de cultivos de campo se enfrenten a rendimientos notablemente reducidos en muchas partes del mundo con un cambio climático abrupto y en muchos lugares pueden volverse completamente insostenibles. La trayectoria actual de las emisiones bien puede suponer un aumento de 4 grados centígrados

en la temperatura media global para finales de siglo, lo que tendrá profundas implicaciones para la agricultura a nivel mundial (Raftery et al. 2017, p. 639). Además de los aumentos de temperatura, esto conducirá a patrones climáticos más erráticos con una frecuencia e intensidad crecientes de eventos climáticos extremos como sequías, inundaciones y olas de calor que afectarán sustancialmente los rendimientos agrícolas en un momento en que existe una demanda mundial creciente (The World Banco 2012, pp.43-46). Estas condiciones representan una grave amenaza para la seguridad alimentaria a nivel mundial, ya que los cultivos de cereales, que normalmente se cultivan en grandes monocultivos y proporcionan una proporción sustancial de las necesidades calóricas humanas, son muy vulnerables a estos cambios (John, 2021). Por ejemplo, el 40 % de la demanda mundial de calorías actualmente lo proporciona solo el arroz, el trigo y el maíz (FAOa, 2018). El clima podría conducir a 'múltiples fallas en el granero', una falla simultánea de estos cultivos básicos en las principales regiones productoras de granos del mundo, principalmente enfocadas en un puñado de naciones en latitudes medias como Estados Unidos, Rusia y China. (Janetos et al., 2017). El riesgo ya está aumentando año tras año y podría conducir a una escasez mundial de alimentos (Rivington et al., 2015).

La principal alternativa a los cereales como alimento básico vegetal en la dieta humana son las hortalizas de raíz y los tubérculos (Jones, Martin y Pilbeam 2007, p.374). Aunque a menudo se almacenan peor y tienen mayores requisitos de mano de obra que los granos, pueden proporcionar calorías de una manera mucho más eficiente en el espacio con diferencias sustanciales de rendimiento por hectárea en comparación con los cultivos de granos (FAOb, 1990). Debido a su alta densidad de rendimiento, también son más fáciles de cultivar de manera eficiente en sistemas de policultivo. Estos sistemas suelen ofrecer una mayor resiliencia a las plagas y mayores rendimientos que los monocultivos (Bracken 2008, pp.2446-2449). También hay varios cultivos productivos de raíces y tubérculos que tradicionalmente han sido cultivados por pueblos indígenas (Plants for a Future, 2012) que actualmente rara vez se cultivan pero que prometen ser cultivados comercialmente (Neacsu, 2019).

Actualmente, se está desarrollando una gama de métodos agrícolas y nuevas variedades de cultivos, como la mejora de granos perennes y cultivos de ingeniería genética para resistir sequías mayores, a fin de abordar el riesgo que el cambio climático representa para la seguridad alimentaria (Mbow et al. 2019, p.471, 504) . Una estrategia que se ha propuesto es cultivar en ambientes controlados, como invernaderos y granjas verticales, como uno de los medios a través de los cuales la producción de alimentos puede mantenerse de manera eficiente en un clima futuro tan inhóspito (Chang, 2019). Si bien estas técnicas tienen valor, por lo general tienen altos requisitos de energía y se utilizan para cultivar verduras, frutas o ensaladas de lujo que son importantes para la salud humana pero solo proporcionan una pequeña proporción de las necesidades calóricas globales (Chang, 2019).

Sin embargo, las condiciones estables proporcionadas por la agricultura de invernadero pueden resultar invaluables con la disminución de los rendimientos del cultivo al aire libre en muchos países en un clima que cambia rápidamente. Si la producción de invernadero se puede utilizar con requisitos de energía mucho más bajos que la mayoría de los sistemas comerciales, también pueden tener posibilidades de cultivar plantas de calorías en forma de tubérculos y tubérculos. Estos se pueden cultivar de manera mucho más eficiente en cuanto al espacio que los granos, que tienen un rendimiento por unidad de área demasiado bajo para que sea práctico crecer a una escala suficiente en condiciones de invernadero.

Estrategias óptimas para promover la seguridad alimentaria y reducir los impactos ecológicos de la agricultura ante el cambio climático

A nivel mundial, la agricultura es responsable de aproximadamente el 11 % de las emisiones totales de carbono del mundo (Center for Climate Solutions, 2019). Se han presentado una variedad de iniciativas, como el desarrollo de variedades de cultivos tolerantes al calor y la utilización de métodos de cultivo sin labranza, para reducir los impactos del cambio climático en la agricultura y reducir la contaminación agrícola al tiempo que se maximiza la eficiencia laboral y se mejoran los rendimientos (Immenschuh, 2014).

Si bien las prácticas agrícolas convencionales están progresando en la mejora de los niveles de eficiencia y conservación de los recursos al tiempo que mejoran los rendimientos (Ritchie y Roser, 2019), se está progresando menos con respecto a la conservación de la biodiversidad (Schwägerl, 2016). Podría decirse que la pérdida global de biodiversidad es la otra gran crisis de nuestro tiempo, que interactúa con los efectos del cambio climático. Tales pérdidas debilitan la resiliencia de los ecosistemas, lo que lleva a la pérdida de formas de vida tradicionales y medios de subsistencia para los pueblos indígenas de todo el mundo y socava la capacidad mundial general para la producción de alimentos (Barnosky et al. 2012, p. 57).

Se han desarrollado métodos alternativos de agricultura que sitúan la biodiversidad en el centro del sistema, a saber, la agroecología; “la aplicación de conceptos y principios ecológicos al diseño y manejo de agroecosistemas sostenibles” (Tallarico, 2019). Hay una variedad de metodologías dentro de la agroecología, con el objetivo general de mantener los altos rendimientos necesarios para una población mundial en crecimiento mientras se conserva la biodiversidad junto con la conservación general de los recursos y la mitigación de la contaminación. Se ha demostrado que la ‘agricultura biointensiva’, por ejemplo, brinda altos rendimientos en un área de tierra pequeña, incluidas las evaluaciones dentro de

un entorno cerrado (Ecology Action, 2010), pero requiere una gran cantidad de mano de obra para obtener rendimientos suficientes (Nauta, 2012).

La permacultura es un movimiento que se ha desarrollado en paralelo a la agroecología como una metodología de diseño predominantemente enfocada en la producción de alimentos y puede verse como una perspectiva sobre el diseño de sistemas agroecológicos (Tallarico, 2019). Es un marco conceptual para evaluar y adoptar métodos existentes (Krebs & Bach 2018, p.5) y es un sistema de diseño específico del sitio y basado en el contexto (Krebs & Bach 2018, p.9). Aunque actualmente está menos representado en la literatura científica, existe evidencia científica que respalda los principios de diseño individuales en un contexto agroecológico (Krebs & Bach 2018, p.3). Puede definirse como "el diseño y mantenimiento consciente de ecosistemas agrícolas productivos que tienen la diversidad, estabilidad y resiliencia de los ecosistemas naturales" (Tallarico, 2019).

La permacultura es un sistema de diseño que se desarrolló emulando patrones y características observadas en los ecosistemas naturales; se basa en una serie de principios de diseño que brindan una metodología accesible para que las comunidades mejoren su seguridad alimentaria (Althouse 2016, p.10). El concepto de permacultura fue cofundado por David Holmgren y Bill Mollison, quienes presentaron los principios en 1974; estos fueron definidos más claramente en 12 principios en 2002 por David Holmgren (Althouse 2016, p.12). El trabajo de David Holmgren se basó principalmente en el trabajo de Howard T Odum, un ecólogo cuyo trabajo se basó en la teoría de sistemas (Holmgren, 2003).

Los 12 principios de diseño estándar se organizaron aún más en un proceso de diseño, desarrollado inicialmente por Althouse (2016) para proporcionar un marco dentro del cual pudieran implementarse al crear soluciones de diseño (Althouse 2016, p.72). Este marco también ha sido recomendado para su uso en Moran (2019) y Mempouo & Moran (2019). Este marco se puede utilizar como plantilla para crear soluciones de diseño y se describe a continuación:

Tabla 1: Proceso de diseño usando principios de diseño de permacultura

Inventario & Análisis	Determinar Necesidades	Diagramas Funcionales	Diseño Conceptual	Diseño Final
Observar & interactuar	Tomar & almacenar energía	Diseño de patrones a detalles	Utilizar soluciones pequeñas & pausadas	Utilizar creativamente & responder al cambio
Aplicar auto-regulación & aceptar retroalimentación	Obtener rendimiento	Integrar en vez de segregar	Uso & diversidad de valor	
Uso & valor de recursos renovables & servicios services	Producir cero desperdicio		Usar bordes & valorar lo marginal	

(Althouse 2016, p.28)

La permacultura también tiene el potencial de proporcionar un marco que se puede utilizar de forma complementaria al conocimiento ecológico tradicional para proporcionar a las comunidades un conjunto de herramientas a partir del cual pueden diseñar sus sistemas. Como defienden McCleary y Moran (2019), los bosques alimentarios de los gremios de permacultura tienen el potencial de mejorar la seguridad alimentaria de los pueblos indígenas en un clima cambiante. Estas técnicas también se pueden utilizar para crear gremios en forma de policultivos de hortalizas de raíz, como se propone en este documento para futuras investigaciones, utilizando principios ecológicos para maximizar el rendimiento (Wooldridge, 2016). Uno de esos principios es el 'Efecto de borde', un principio ecológico donde hay una "tendencia a tener una mayor variedad y densidad de organismos en la zona límite entre las comunidades" (Lawrence 2000, p.183). Este principio se utiliza en bosques alimentarios de permacultura que buscan imitar la productividad ecológica de un borde de bosque con plantas que crecen en todos los niveles, desde el dosel de los árboles hasta la cubierta del suelo, maximizando la eficiencia fotosintética y la productividad de los cultivos por unidad de área (Crawford 2010, p.29). Este principio se observa en la etapa de diseño del concepto del proceso de permacultura anterior como 'Usar bordes & valorar lo marginal '.

Este principio podría utilizarse para policultivos de tubérculos, por ejemplo, con cultivos que crecen en hileras en una estructura semicircular, como un politúnel, orientado para obtener la máxima luz solar según la ubicación geográfica. En tal configuración, el cultivo más alto podría cultivarse en la fila central, con cultivos sucesivamente más cortos en filas a cada lado para maximizar la eficiencia fotosintética y espacial de la producción por unidad de área y cultivar una diversidad saludable de especies para minimizar los problemas de plagas. Este enfoque también podría utilizarse con prácticas beneficiosas estándar, como la rotación de cultivos con policultivos de leguminosas, cultivos de cobertura y otros métodos para mantener la fertilidad del suelo junto con la recolección de agua de lluvia en los techos y otros métodos de diseño para minimizar los requisitos de insumos. En la sección "Ejemplos de estudios de casos" a continuación se proporcionan ejemplos detallados específicos de especies de cultivos. Tal configuración también podría usarse en forma triangular para una estructura, como el invernadero solar pasivo de ejemplo que se muestra a continuación en la Figura 1:

Figura 1: Invernadero solar pasivo (Crook, 2021)

Si bien hay una variedad de tipos de invernaderos, generalmente se evalúan de acuerdo con su utilidad como la herramienta más adecuada para un conjunto particular de requisitos de cultivo en lugar de que un tipo necesariamente se considere superior a los demás. La mayoría de los invernaderos comerciales, por ejemplo, son grandes invernaderos que pueden proporcionar rendimientos muy altos de cultivos comerciales. También tienden a tener altos costos de energía para calentarlos y enfriarlos debido a los valores de aislamiento relativamente bajos de las cubiertas de vidrio o policarbonato (Awad, 2012) en comparación con materiales como la tierra o el ladrillo, que normalmente se construyen con aislamiento adicional o características

como espacios aéreos internos (Archtoolbox, 2022). También se están desarrollando nuevas tecnologías innovadoras como los invernaderos de agua de mar (Sundrop Farms, 2016).

Los invernaderos solares pasivos también ofrecen una gran promesa como sistema para cultivar alimentos de una manera eficiente en términos de energía y espacio, particularmente en el contexto de la alteración del clima. A diferencia de los invernaderos comerciales típicos en los que las paredes y el techo de la estructura están hechos de un material transparente como el vidrio, los invernaderos solares pasivos suelen tener uno o más lados hechos de un material aislante como el ladrillo (De Decker, 2015). Los invernaderos solares pasivos solo usan la energía del sol y soluciones de diseño innovadoras para mantener temperaturas constantes para el crecimiento de las plantas en lugar de depender de aportes de energía externos en el caso de la mayoría de los invernaderos comerciales. Como tales, están diseñados para lograr la máxima eficiencia, y un diseño famoso es el "invernadero solar chino". Este diseño tiene un solo lado expuesto al sol y los otros lados están hechos de un material aislante como el ladrillo, con ventilación pasiva y una cubierta que se puede enrollar sobre el lado transparente. La cubierta ayuda a retener el calor durante la noche o a enfriar el invernadero en caso de calor excesivo (De Decker, 2015), como se puede observar en la figura 2 a continuación:

Figura 2: Invernadero solar Chino (De Decker, 2015)

Sus requerimientos mínimos de energía han llevado incluso a su promoción a nivel gubernamental en China (De Decker, 2015); aunque actualmente no se utilizan en la misma medida en la mayoría de las naciones occidentales, parecen tener un gran potencial como tecnología a nivel mundial.

Su falta de necesidad de combustibles fósiles, bajos costos de capital y simplicidad de construcción han actuado como incentivos para que esta tecnología se utilice a gran escala. La falta de requisitos de combustibles fósiles y el bajo costo son particularmente atractivos en China, donde el diseño del 'invernadero solar chino' ahora cubre más de un millón de hectáreas (De Decker, 2015) y podría, por ejemplo, ampliarse aún más para cultivar tubérculos adicionales como un reemplazo para la disminución de los rendimientos de grano. Las tecnologías de invernaderos solares pasivos también se han utilizado a pequeña escala en todo el mundo, siendo populares en el movimiento

de permacultura y también utilizadas por los aymaras de Bolivia que construyen 'Walipinis', invernaderos solares pasivos de pozo (ver Fig. 4 a continuación) , en el que pueden producir cultivos en condiciones altamente áridas (Ceres Greenhouse Solutions, 2014).

Figura 3: Walipini (Ceres Greenhouse Solutions, 2014)

Uno de los principales métodos que estas comunidades marginadas también han utilizado para mejorar su seguridad alimentaria es el uso de la permacultura, que se está promoviendo en muchas naciones de bajos ingresos del mundo, por ejemplo, en Malawi en el Instituto Kusamala de Agricultura y Ecología (Kumbali , 2019). Se ha recomendado el uso de tales métodos en los bosques alimentarios de los gremios de permacultura para organizar una agricultura resiliente al clima (McCleary & Moran 2019, pp.37-47). Dichas técnicas también podrían aplicarse para usar los principios de diseño de permacultura descritos en la Tabla 1 para proporcionar condiciones de crecimiento en un ambiente controlado para cultivos básicos de tubérculos y tubérculos en estructuras como Walipini.

Ejemplos de estudios de caso de posibles policultivos de hortalizas de raíz

A continuación, se muestra un ejemplo de un conjunto de cultivos que podría usarse para dicho sistema utilizando ejemplos de cultivos alimentarios andinos tradicionales que brindan una plantilla generalizable para futuras investigaciones. En este caso, se cultiva en una estructura como un invernadero solar chino con las especies de cultivo más altas en la parte trasera del área de cultivo y cada especie sucesivamente más corta se cultiva en hileras al frente para maximizar la eficiencia:

- Se podría cultivar una hilera de mashua en la parte trasera en un enrejado; mashua es una planta trepadora que proporciona tanto una cosecha de hojas durante la temporada de crecimiento como una cosecha de raíces.
- En la siguiente fila hacia adelante, se podrían cultivar papas, como la siguiente especie de cultivo más alta, con espacio entre las filas para el deshierbe y el mantenimiento.
- Frente a esto se podría sembrar oca, otro tubérculo productivo con un hábito de crecimiento más bajo que el de la papa.

• Ulluco, un cultivo de raíz con un hábito de dispersión muy bajo que a menudo se usa como cobertura del suelo para la supresión de malezas (Cultivarable a, 2022), también podría cultivarse como complemento de las papas y la oca.

Figura 3: Mashua, Papas & Oca en secuencia (Cultivariable, 2013), (National Gardening Association, 2014), (Moran, 2021)

Figura 4: Cubierta del suelo con Ulluco (Cultivariable b, 2022)

Esto podría cultivarse en rotación con un policultivo de leguminosas, alternando cada temporada de crecimiento entre los dos para mantener la fertilidad del suelo y minimizar la acumulación de enfermedades:

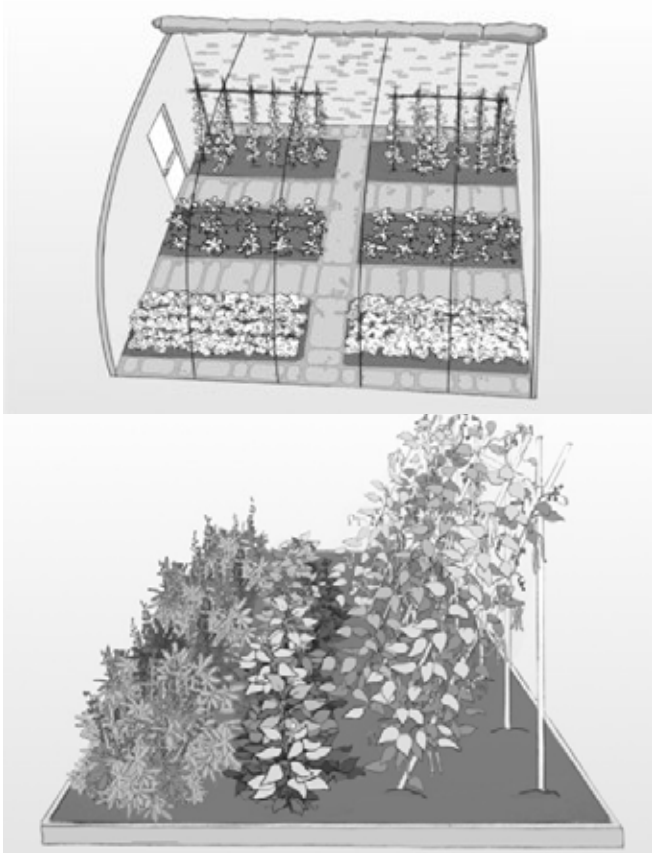
• Frijol escarlata que crece en el enrejado en la parte trasera del invernadero en rotación con la mashua, además de ser una leguminosa fijadora de nitrógeno que produce un cultivo de frijol rico en proteínas, esta especie también produce un tubérculo comestible

• Se podría cultivar una hilera intermedia de judías verdes tipo arbusto

• En el frente, Tarwi, un lupino comestible cultivado en los Andes podría cultivarse en la primera fila como la especie más pequeña. Esta planta produce un cultivo de semillas rico en proteínas y aceites además de ser un fijador de nitrógeno.

Figura 5: Ejotes, judías verdes & Tarwi en secuencia (Gulisano et al. 2019), (West Coast Seeds, 2022), (Royal Horticultural Society 2007, p.2)

A continuación se ilustra un esquema completo de cómo podría verse un sistema de este tipo de perfil, mostrando los dos policultivos de ejemplo en rotación en un invernadero solar chino.



Tarwi, French Beans & Runner Beans in sequence

Oca, Potatoes & Mashua in sequence with Ulluco ground cover

Figura 6: Passive Solar Greenhouse Schematic (Howell, 2022)

El potencial de los policultivos de hortalizas de raíz y los invernaderos solares pasivos y el margen para futuras investigaciones

Este documento propone una estrategia adicional para ayudar a brindar seguridad alimentaria y salvaguardar el patrimonio botánico frente a las crisis de la biodiversidad y el cambio climático. La permacultura merece una consideración particular como un conjunto de criterios de diseño, ya que tiene como objetivo buscar la máxima eficiencia energética y productividad (Bohler, 2017). En el contexto de la producción de cultivos básicos, esto es especialmente pertinente ya que la eficiencia laboral debe maximizarse como parte de la eficiencia general. Si bien la producción de cultivos de tubérculos y tubérculos ocupa un espacio eficiente, también debe hacerse a escala, y la mano de obra agrícola es muy valiosa en muchos lugares (Roser, 2019).

Como se describe en el marco de la Tabla 1, los principios de diseño de la permacultura se pueden aplicar a la producción de cultivos en sí y al diseño, construcción y mantenimiento de estructuras para permitir condiciones de crecimiento estables ante un cambio climático abrupto.

La producción de alimentos en invernaderos solares pasivos tiene el potencial de ser simple, de bajo costo y energéticamente eficiente, proporcionando alimentos básicos a escala en un clima hostil y, como tal, merece una mayor investigación.

Ya sea que se utilicen como un sistema completo de nutrición alimentaria para una comunidad, para la producción local de alimentos básicos de forma complementaria con otras actividades agrícolas, o para obtener ingresos complementarios de cultivos comerciales, tubérculos y tubérculos, los policultivos en instalaciones cubiertas ofrecen un gran potencial. Su simplicidad y replicabilidad como sistema de diseño basado en principios de permacultura, con bajos costos, rápidos tiempos de respuesta y escalabilidad, también son notables para las comunidades marginadas y la agricultura.

También se debe tener en cuenta que, si bien los métodos biointensivos se han investigado en un entorno cerrado, hasta ahora ha habido una falta de pruebas prácticas de tales conceptos en el contexto de la permacultura (Jeavons 2001, pp.65-76). Dicha investigación podría, por ejemplo, llevarse a cabo directamente a través de ensayos de campo comparativos de varias estaciones entre el cultivo en interiores y al aire libre de policultivos de tubérculos y hortalizas de raíz y entre parcelas de policultivo y monocultivo de cada uno de los cultivos bajo investigación para comparar los rendimientos respectivos.

Se requieren investigaciones prácticas de métodos de policultivo agroecológico y sistemas de invernaderos solares térmicos basados en principios de diseño de permacultura. Tanto como un ejemplo de estudio de caso de cómo esas comunidades podrían salvaguardar las plantas que los pueblos indígenas usan para su beneficio, como una aplicación más integral para la producción de cultivos básicos para salvaguardar la seguridad alimentaria de manera más amplia. Como parte de un conjunto de medidas de adaptación, pueden ayudarnos a mitigar el riesgo para la seguridad alimentaria que plantea el cambio climático abrupto y ayudarnos a eludir el gigante.

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Green Energy Mining and Indigenous Peoples' Troubles

Negotiating the Shift from the Carbon Economy to Green Energy with FPIC

By Rudolph C. Ryser, PhD
Chairman and Executive Director, Center for World Indigenous Studies

ABSTRACT

The countries of China, the United States, India, Russia, Japan, and Germany emit 60% of the world's carbon gases that cause climate change and the breakdown of biodiversity. At the same time, these countries, and the corporations they created seek to make sizable economic profits from "Green Energy" as a replacement for dependence on the carbon-based economy. State government and corporate policies promote the mining of metals such as gold, tantalum, and lithium—key elements necessary for supporting the development for electrical replacements to petroleum-based machines like cars. The problem explored in this article is that while effecting "green energy" is a positive step toward reversing the adverse effects of the carbon-based economy, catastrophic damage is done to the environment and indigenous peoples. The consequent mining and other resource exploitation of the "greening" directly destroy and pollutes the environment while violently forcing the removal of indigenous peoples from their territories or now killing thousands of people. Democratizing mining and other resource exploitation inside indigenous peoples' ancestral territories is essential and must become the new standard—a standard based on obtaining the consent of the affect indigenous peoples. The author presents a green-energy plan for mediating relations between indigenous nations, corporations, and states. Mining and exploiting "green energy" resources is a dominant yet destructive economic activity in the Democratic Republic of Congo (DRC)—the second largest state in the African Continent.

The DRC illustrates the problem as the largest source of "green-energy" tantalum—a "refractory metal" mined with lithium essential to producing capacitors, computer chips and semiconductors used in electric technology. Tantalum and lithium are mined primarily from the territories of indigenous nations with disastrous consequences.

Keywords: Twa, Mbuti, Balega, Tantalum, Lithium, Gold

The Cost of Green Energy

The rapidly accelerating "Green Energy" drive by political leaders of high technology countries, their mining companies, and the electronics producers to reduce or eliminate carbon-energy dependence now threatens the biologically diverse ancestral territories of indigenous peoples worldwide. To achieve the transition to green energy without creating new damage to the environment democratizing and mediating climate change, regulating mining, resource exploitation and corporate agricultural development States, corporations and NGOs must effectively ensure the approval of these activities by indigenous peoples' communities.

Since the early 1970s, scientists who study the weather and the environment have increased the volume of their alerts to political leaders that human development and especially dependence on petroleum combine to destroy life-supporting biodiversity and increasingly radically change the climate. During the years since the initial alerts, states' governments and international institutions failed to change the human behaviors that threaten life on the planet. Political leaders and organized efforts launched efforts in the first two decades of the 21st century to promote "green energy" as the alternative to unrestrained development and dependence on carbon-based fuels. "Green energy" calls on industry and governments to emphasize the development of renewable energy sources. These sources must support a turn to electric cars, energy-efficient household appliances, expanded use of solar panels and wind-generated electricity, use of computers, and other electricity-based technology. The "green energy" focus seeks to reduce carbon emissions and achieve "net-zero" carbon emissions. More than 1000 companies worldwide have made net-zero commitments to attain this goal by 2100. The shift to "green energy" is a powerful statement to secure a healthy climate and environmentally safe Earth—except the commitment is only a partial solution to the needed global climate and environmental breakdown.

Merely committing without enforcement of that commitment produces beneficial publicity but no "net-zero" or "green energy" results. Indigenous nations, small and large, must be at the negotiating table with state, corporate, NGO, and effective mediators to formalize agreements controlling and environmentally managing the extraction of resources from indigenous peoples' ancestral lands. In accord with international law formalized under the principle of "free, prior, and informed consent," indigenous nations must be recognized with full power to consent to or reject access to their territories. Indigenous nations, states, corporations, and NGOs must provide international mediation. They must provide negotiated agreement enforcement to maximize the beneficial outcomes expected from decisions between the concerned parties.

Indigenous nations, states, corporations, non-governmental organizations, and commercial producers all have a vested interest in equitable negotiations based on free, prior, and informed consent—democratizing international relations. Destruction of indigenous communities, the

environment, the climate, and indeed all of humanity now depends on decisions based on fair and equitable negotiations.

After reviewing the example of the failure of mining and corporate agriculture in the Democratic Republic of Congo's indigenous peoples' territories, we discuss a framework for monitoring, negotiating, and enforcing safe and responsible corporate actions in the final section of this article.

Shifting to electrical technology as now contemplated requires establishing extensive regulations, commitments, and controls on corporations extracting raw materials from indigenous territories—the principal sources of minerals, metals, and materials essential to support the making of the new technology. Nations, states, and corporations must institute international regulations through negotiations controlling corporations such as Glencore, with headquarters in Switzerland, and Générale des quarries des Mines (Gécamines), with headquarters in China—two of the largest transnational mining companies in the world. Mining companies from Switzerland, China, Canada, and the United States dig vast pits and quarries primarily in indigenous peoples' territories to extract electric technology-based materials such as copper, aluminum, gold, tantalum, lithium, and cobalt. Out of sight from the consciousness vision of urban populations advocating "green energy" solutions, these companies—often with the complicity of corrupt government officials, profit-oriented importing companies such as Toyota, Tesla, Intel, Apple, and the computer chip-making Gécamines—contribute to the destruction and pollution of vast lands, rivers, and rainforests, impoverishment of local and indigenous peoples, force the removal of indigenous peoples from the ancestral lands, and contribute to the trafficking of indigenous women, killing of members of communities and further corruption of governments.

In this article, I discuss the detrimental consequences of "green energy" for indigenous peoples, their neighbors, the earth, and the global economy. This discussion reveals that while there are severe disadvantages to "green energy," it is possible to nearly eliminate the adverse effects on people, the earth, and the climate. By recognizing indigenous peoples' ancestral lands as THEIR territory and that they must agree to the terms for entering the territory and extracting raw materials, it will be possible to undertake "clean extraction." Enforceable controls on companies and the state stipulated and agreed to by the indigenous peoples are essential. A negotiated agreement between indigenous communities and the corporate and political interests seeking access to indigenous territory and resources must fully express the internationally recognized principle of free, prior, and informed consent (FPIC). We examine in detail the indigenous territories, "green energy" materials, and resources in the Democratic Republic of Congo—a significant source of these materials.

"Clean" Technology and the Minerals needed

What if the World Meteorological Organization (WMO) report[1] that projects with 100% certainty the average global temperature will exceed 1.5

degrees Celsius at least for one year within the next five years proves true: nowhere on Earth will be safe on a catastrophically warming planet. Conservationists, environmentalists, climate scientists, and political leaders call for changing the dependence on petroleum that causes the climate changes to mineral components to manufacture laptops, smartphones, electric cars, and batteries. We may ask the questions: "Where are the minerals that will make the technological alternative to petroleum happen? What minerals are needed for the techno-revolution? Well, two elemental minerals commonly used to make smartphones, Xboxes, TVs, batteries, computers, electric automobiles, and other electronic devices is a mineral commonly called "coltan." Without coltan, the ability to conduct digital communications using Zoom and Skype would be impossible, and hospital equipment designed to scan people's bodies to diagnose diseases would not exist.

Coltan is the short expression for *columbite-tantalite*, a metallic ore extracted from the grounds of the Democratic Republic of the Congo. The mining takes place mainly in the Kahuzi Biega National Park, where the Batwa people's ancestral lands are located and where the Dian Fossey Gorilla Fund International continues to work protecting gorillas.

The demand for Columbite-tantalite ore[2] is central to the commercial and government development of electricity-dependent technology intended to replace the petroleum-based economies of countries worldwide. The popular commentary is that electricity in support of technology is essential to electronic devices, new modes of transportation, space satellites, military drones, and hospital equipment such as x-ray and kitchen appliances. While we all want to promote the development of new technology to reverse environmental damage done to the earth by petroleum dependency, from where do we think the minerals come?

The technology minerals and metals are contributors to environmental damage to soils and waterways in part due to mining by-product waste and other materials and disruption of the natural environment and to the health of nearby communities and the men, women, and children who mine these resources. Mining contributes to deforestation when trees and vegetation are cleared and burned. Topsoil, flora, and fauna are stripped away. Chemically reactive minerals are harmless when underground, but when they are mined and brought to the surface they often react spontaneously to oxygen and water resulting in acids and metal ions. The acid mine drainage is a risk after mines are closed even if stored by the mining company.

Mining companies and governments are disinclined to manage the adverse effects of mineral and metal extracts due to the additional costs for remediation. Clean-up is usually not

[1] WMO Global Annual to Decadal Climate Update 2022 and 2022-2026. World Meteorological Organization. https://public.wmo.int/en/media/press-release/wmo-update-5050-chance-of-global-temperature-temporarily-reaching-15%C2%B0c-threshold#:~:text=the%20Global%20Annual%20to%20Decadal%20Climate%20Update%2C

[2] Columbite-tantalite, coltan for short, is a grey metallic ore found in large quantities in the eastern areas of Congo. After processing and refinery, coltan is converted to tantalum in a metallic state. Its properties include heat resistance, capable of withholding relatively high metallic charges.

regulated, and the consequences of the mining can be disastrous for people, the environment, and the climate. There are measures to prevent the damages caused by mining that can be taken. But to bring effective regulation into effect it is necessary that indigenous nations, corporations, governments and communities become party to creating regulations and appropriate enforcement—to ensure clean results.

Resource Extraction and Climate Change

Electricity, that spark of thunderstorm energy from the sky, is touted as the solution to modern energy needs to eliminate carbon gas generating fuels that contribute to Climate Change resulting from human activity. The countries of China, United States, Russia, India, Japan, Canada, Germany, South Korea, and Brazil consume 64.1% of the world's non-renewable oil, natural gas, and coal. Six of these countries generate 60% of the world's greenhouse gases: China (28%), the United States (15%), India (7%), Russia (5%), Japan (3%), Germany (2%).[3] Coal is the biggest electricity generator while producing the most significant carbon gas release.[4] This simple tally of carbon producers is evidence that these countries are the main contributors to high levels of carbon gases in Earth's atmosphere.

Disastrous fires destroying towns and villages, drought eliminating the capacity to grow food crops, deaths due to extreme heat, destructive windstorms, floods, and more are already happening. The World Meteorological Organization Secretary-General Petteri Taalas stated: "The 1.5-degree Celsius figure is not some random statistic. It is rather an indicator of the point at which climate impacts will become increasingly harmful for people and the entire planet."[5] The WMO report author Mark Diesendorf concluded that it is "simply impossible for renewable energy to overtake the retreating target." He suggests it is "too late!" Yet governments, extractive industries, and commercial producers of electronic devices, cars, batteries, and other equipment insist that they must exploit the territories, peoples, and environment of indigenous nations for minerals essential for supporting the technological alternative.

All these governments are shifting some of their energy dependence from fossil fuels as their primary energy source especially for transportation to electricity generated by nuclear power plants, solar panels, wind generators, and computer capacitors and batteries.

The US government, for example, enacted a massive Infrastructure Investment and Jobs Act in November 2021 to build a countrywide electrical vehicle charging network, improve powerlines, and promote commercial production of electric cars and other electricity-dependent products.

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[3] Blokhin, Andriy. (2022) Invesgtopedia: https://www.investopedia.com/articles/investing/092915/5-countries-produce-most-carbon-dioxide-co2.asp

[4] IBID.

[5] Kolhatkar, S. (2022) " 'We know where we are headed': humanity is sacrificing itself on the altar of corporate profits." May 14, 2022. https://www.alternet.org/2022/05/humanity-sacrificing-itself-corporate-profits/

Ample evidence has been compiled by climate scientists, environmentalists, and conservations demonstrating that a massive and immediate global shift from petroleum-based energy to electrical-based energy is a critical step needed to meet what is now a climate change crisis. Conservationists, government environmental policymakers, and commercial electronics companies widely advocate the transition to electronics. These entities are the primary advocates of batteries, solar panels, wind electricity generators, household appliance makers, nuclear power plants, ground and air vehicles, military hardware (including rockets, ground vehicles, drone vehicles, satellites), computers (including iPads, iPhones, laptops, etc.)

A History of Economic Plunder of DRC

Mining sites in the Democratic Republic of Congo are in one of the world's most biodiverse regions, with a little more than 60% of the people living in rural areas. More than half of the DRC population of 89.562 million does not have access to potable water, and electricity is available to less than 1% of the people in rural areas. Its lands are rich with commercially attractive gold, diamonds, copper, and forest products, including timber and petroleum. Consequently, individual men, women, and children working as individual "hand-in-ground" miners seek to earn small amounts of money to dig up minerals, elements, and precious gems for large corporations.

Despite the enormous wealth gained from raw materials extraction by a small elite, poverty in the country is rampant, and the Indigenous peoples in their territories suffer from removal from their lands and crimes, including genocide. The beneficiaries of this abundance are the state's political class and countries remote from Africa, including China, Canada, Switzerland, the United States, and the United Kingdom. Understanding the complex roots of resource and human exploitation in the Democratic Republic of Congo urges us to promote "green energy" produced from negotiated agreements with indigenous nations as action to bring the political, economic, and human violence to an end.

Small-scale mining

"Artisanal"[6] and small-scale miners[7] (ASM) join transnational mining corporations in the extraction of raw gems, minerals, and commercially wanted materials for electrical technology from ancestral lands of indigenous peoples such as the Batwa and the Balega located in the Ituri, North Kivu and South Kivu provinces

[6] Fritz, M. James, M., Collins, N., and Weldegiorgis, F. (2017). "Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues. Winnipeg. International Institute for Sustainable Development. "Despite its low productivity, ASM accounts is an important source of minerals and metals. It accounts for about 20% of the global gold supply, 80% of the global sapphire supply, and 20 percent of the global diamond supply. ASM is also a major producer of minerals indispensable for manufacturing population electronic products, such as laptops and phones ... producing "26 per cent of the global tantalum and 25 per cent of tin." In many countries, 70 to 80 per cent of small-scale miners are informal workers producing "damaging socioeconomic, health and environmental impacts, which trap the majority of miners and communities in cycles of poverty and exclude them from legal protection and support."

[7] Walser, G. (2019) "Economic impact of world mining." World Bank Group Mining Department, Washington D.C., USA. IAEA-SM-362/7. According to the World Bank, "small scale mining is "a poverty-driven activity" providing minimal income to an estimated 13 million men and women, while the Bank recognizes that the mining performed by small scale miners contributes to environmental damage, social breakdown, and conflict mineral mining—smuggling of minerals for profit.

of eastern Democratic Republic of Congo. Small-scale mining is not so small:

1. An estimated 150 million men, women, and children are paid often less than poverty wages (and frequently outright slavery) to mine for minerals with their hands and labor to produce a major portion of the world's tantalum, tin, gold, and precious gems.

2. ASM accounts for 80% Sapphires, 20% gold, 20% diamonds,

3. Small-scale mining is poorly regulated by local authorities due to the absence, lack of legal framework, or the capacity to enforce existing frameworks.

4. Small-scale mining in Central African Republic generates $114.7 million into the economy,

5. Groundwater contamination, sinkholes occur where overlaying ground of the mine collapses, contamination of soils by-products of mining gold, and other metals released into the soils undermines vegetation, contamination adversely affects the local ecosystem, artificially modifying wildlife numbers.

6. ASM – gold mining buying, and refining facilities are in 55 countries but are a significant cause of mercury pollution.

7. ASM for gold is the largest source of anthropogenic mercury emissions to the environment of any sector globally, followed by coal combustion and non-ferrous metals.

8. High doses of mercury can affect neurological and behavioral disorders, cardiovascular disease, high blood pressure, impairment of peripheral vision, kidney impairment and virtually no health support is provided to small-scale miners.

9. World Bank's optional solutions: a. encourage local economic and social aspirations, creating an environment for co-existence through employment, b. Vocational training to make a career path, c. establish a structure that includes an authoritative body to maintain good working environments, rights, and practices.

As the Greenpeace organization reported in its 2004 report on deforestation in the Congo Basin, including the Democratic Republic of Congo:

> Economically the region remains poor and indebted: despite its important oil reserves and revenues, combined with timber, diamond, gold and other minerals, countries all rank either in the 'Moderately Indebted' (Cameroon) or in the 'Severely Indebted' (all the other countries) categories of the World Bank. Although the situation may appear paradoxical, it is to a large extent explained by state patrimonialism and the persistence of "economies of plunder": the appropriation of public goods by public 'servants' and their private partners, rarely managed in the public interest but rather for private gains.

The riches were early targets after the arrival of the Portuguese in 1482 feasting on the human slave trade from both sides of the mouth of the Congo River for the next 300 years during the rise of the Kuba Federation in what is now southern Congo. Belgium's King Leopold II began his

colonization schemes at the beginning of the 1870s followed by his establishment of the Congo Free State under his direct control. The Kuba Federation fought violently to resist Belgium's slave trade and unrestrained exploitation of rubber, ivory, timber. By 1908 Leopold is forced to relinquish control over the peoples and territory leaving behind the removal and killing of an estimated 10 million people. Belgium continued exploitation of lands, resources and people by instituting forced labor regimes and then robbing the treasury just before 1960's independence was won. Belgium continued to interfere in the internal affairs of the region seeking control over vast copper deposits and with the failed purported efforts of the American government's Central Intelligence Agency facilitated the killing of the elected leader of the country Lumumba. Throughout the decades to follow wars were started[8] and squelched by outsiders seeking to gain control over the rich resources for commercial export through neighboring countries.

Conflict Minerals

Carbon-based Energy and Green Energy minerals, metals, and precious stones are at the center of violent conflicts involving state/indigenous community/local community small-scale miners, corporations in dispute with local small-scale miners, mineral and human trafficking, and forced population removals involving militias, indigenous peoples, the environment. Transnational mining corporations, states' governments, and importer states are all caught up in violent confrontations. Violent conflicts in the ancestral territories of indigenous nations with abundant natural wealth are convenient targets for states and transnational corporations.

While state political leaders and corporate executives covet stable conditions in indigenous peoples' territories that include considerable natural wealth, the unstable territories are valuable. Government authorities can invoke the state's police powers to advance corporate interests.[9] Conflicts arise between competing small-scale miners and communities living near mining sites. In the Democratic Republic of Congo, the government deployed nearly 800 troops to attack its citizens to forcibly remove 10,000 artisanal miners from one of its largest copper-cobalt mines—the Tenke Fungurume Mine (TFM) and destroyed the small village of Kafwaya in the process. The DRC also supported the expulsion of 20,000 artisanal miners at Glencore's Kamoto Copper Company mine. The greater the violence, the "fewer livelihood options" for the individual, men, women, and children engaged in small-scale mining working to avoid the consequences of widespread poverty.[10]

[8] Rwanda's Hutu government orchestrated a genocide of Tutsi and moderate Hutu in 1994 and when they were defeated over a million Hutu took refuge across the border (including many of the genocide leaders to Zaire the area so named from 1971 to 1997 that became the Democratic Republic of the Congo). The new Congolese government installed by the Rwandan militias blocked efforts by the UN to protect Hutu who continued to flee to the interior. The Rwandan militia was renamed as the Army for the Liberation of Rwanda (ALIR) with members inside and outside the Congo.

[9] Rigternink, A., and DeCaires Gall, K., October 27, 2020. "The Future of Conflict Mining." Political Violence at a Glance." Online magazine. https://politicalviolenceataglance.org/2020/10/27/the-future-of-conflict-in-mining/

[10] IBID.

In the United States, the government is working with the Perpetua Resources company to develop a vast open-pit gold mine that would produce 115 million pounds of antimony in Nimiipuu[11] territories (State of Idaho). Antimony[12] is an element critical to manufacturing the high-capacity liquid metal batteries. The Nevada Lithium company is preparing to break ground for a 1000-acre lithium mine in Paiute and Shoshone territory to extract the element for electric car batteries.[13]

Conflicts in the states of Indonesia (West Papua), Burma (i.e., Shan, Mon, Karen), Iraq (i.e., Ezidikhan, Al-Dulaimi, Kurdistan), Brazil, Sudan, and the Democratic Republic of the Congo are rampant. Acts of criminal attacks on indigenous peoples by indigenous peoples are commonly associated with land disputes and the extraction of so-called green energy minerals and metals. The Banyarwanda (Tutsi and Hutu settlers from Rwanda and Uganda violently driven into eastern DRC in the 1990s by the Rwanda genocide and similar contests in Uganda) appropriated ancestral lands of the Hunde, Nyanga, and Nande in the eastern Democratic Republic of Congo. To retrieve control over their lands, members of the three tribes formed militias to drive out the Tutsi, and the Hutus regarded as invaders. Under the moniker "Mai Mai," armed groups became resistance forces in opposition to what they consider immigrant communities and ethnic Rwandans. Their agendas range from defending their land to control resources to extortion, illegal taxation, and banditry. The Banyarwanda formed counter-armed groups that violently attack the Mai Mai groups and they have their own agenda to raise money through extortion, trafficking, and mineral smuggling to Rwanda, where eager buyers to resell the green energy minerals to companies in the United States, Canada, United Kingdom, and China.

Female fighters from a Mai Mai group in North Kivu, DRC. Photo: Matchbox Media Collective.

Figure 1: A Troop of Mai Mai

The Karen, Shan, Mon, Kachin, Rohingya, and others in Burma are engaged in a major conflict with the criminal military enterprise the Tatmadaw. The Tatmadaw, on February 1, 2021, seized control over the territories of all the nations and their minerals, precious gems, and oil resources. The country long known as Burma includes more than 135 different indigenous nations with ancestral territories covering the whole country. Though many indigenous nations, the Chin, Kachin, Kayin, Kayah, Mon, Rakhine, Bamar, and Shan are widely used names to group the many nations though the Hani, Khun, Wa,

[11] Nez Percé is the name given to the "reserved lands" of the Nimiipuu—the name they have for themselves. Nez Percé is a French language derived name meaning "pierced nose." Nimiipuu has a current population of more than 3,500.

[12] Antimony is identified in the table of elements as with the atomic number 52. It is a gray metalloid found primarily as the sulphide mineral stibnite.

[13] Healy, J., Baker, M., December 27, 2021, "As Miners Chase Clean-Energy Minerals, Tribes Fear a Repeat of the Past." New York Times.) (Golden, Hallie., October 15, 2021. Indigenous Tribes tried to block a car battery mine. But the courts stood in the way." The Guardian.

Palaung with many others may also be cited when dealing with ancestral lands. Numerous transnational corporations pay money directly to the Tatmadaw to continue mining. These companies include the Sino exploration & Mining Company of China and Tegiva Mining Company Ltd, registered in Accra, Ghana. Other companies include the Mustafa Rivers and Mining Company, registered in the United States, and another company from China, the Shanghai Kadi Metal Mining Co., Ltd. Many of these companies are registered with the United Nations Global Compact, pledging to respect and abide by ten principles. However, these companies are directly complicit in the dislocation and killing of several thousand indigenous people by the Tatmadaw.

The Iraqi government militias and the Kurdish Regional government have seized control over oil and gas resources inside Ezidikhan (Yezidi) territory and Al-Dulaimi Confederation territory by the Kurdish Regional Government and the Iraqi government militaries. The long-term dispute over control of West Papua (since 1949) in Indonesia, where mining concessions transnational corporations were located, resulted in the Indonesian military's dislocation and suppression of the Papuan peoples. The copper and gold mines cleared and polluted significant forest areas in the Erstberg and Grasberg mountains, the Paniai and Wissel Lakes Region, Fak Fak, the Baliem Valley, and the border area next to Papua New Guinea resulted in the dislocation and suppression of the Papuan peoples by the Indonesia military.[14] As the Democratic Republic of Congo map in Figure 2 illustrates, the critical minerals of cobalt, tantalum and lithium are extracted from Hunde, Nyanga, Nande and Twa territories and trafficking is closely associated with Rwanda and Uganda.

Figure 2: The Democratic Republic of Congo is now the world's largest producer of the conflict minerals tantalum with Brazil in second place followed by Rwanda, Nigeria, and China.

Negotiating the Free, Prior and Informed Consent of the Twa

The Kahuzi Biega National Park administrators were forced into negotiating with the Batwa to mitigate adverse consequences of the "conservation expansion" of the park. Even though the Batwa had lived in their ancestral lands long before the DRC was created; and had been forcibly expelled from their territory demands were made for a negotiated settlement of Batwa claims. The Forest Peoples Program, with headquarters in England (info@forestpeoples.org) attempted to facilitate a dialogue between the Kahuzi-Biega National Park

[14] "Mining." https://www.cs.utexas.edu/users/cline/papua/mines.htm

in South Kivu and the Batwa communities living around the park. Because the Park authorities showed "no willingness to meet any of the commitments they have made to communities in previous discussions and instead have taken the route of violence and intimidation in order to keep Batwa people out of the Park by force"[15] the Forest Peoples Program withdrew from its mediation role. The negotiations collapsed because there was no mediating mechanism and no enforcement of any agreements. We discuss an alternative approach below that may have effectively proved successful.

Corruption, Militias and Massacres

Eastern DRC has more than 70 independent armed groups originating from Rwanda and Uganda.[16] These groups making sure to get their share of the minerals and making sure to keep the flow of trafficked minerals coming across the border. The Tutsi Banyamulenge had migrated from what is now Rwanda to the Congolese town of Mulenge more than 100 years earlier. The Congolese authorities challenged their citizenship in the DRC. This challenge led to insurgencies that have evolved into smuggling Tutsi militias running minerals across the border into Rwanda. Smuggling by these and other groups make up such a vast industry—so lucrative—that the governments of Uganda and Rwanda support the militias and trafficking. Ultimately the European Union and the United States, the main customers of these minerals (for "green" energy), turn a blind eye to the violence and criminal enterprises. The successful trafficking in valuable green energy minerals appears to be why the US backs up President Paul Kagame, the authoritarian human-rights violator in Rwanda.

Indigenous peoples and peoples attached to the DRC are forcibly removed from mining sites, and they get killed all the time in these conflicts just because they are in the way. But the Twa (Batwa is used interchangeably with Twa) in Tanganyika province farther south have also suffered attacks and forced removals. It's a crisis. When the US and European Union buy the green energy minerals from Rwanda and Uganda—minerals that originate in the DRC—they can pretend to not have knowledge of the criminal enterprise.

Figure 3: Ituri and Tanganyika - Centers of violence and resource extraction.

[16] Armies from Rwanda and Uganda and other African countries have continued to engage in violence in eastern DRC serving in part as traffickers in the rich resources to Rwanda and Uganda extracted from Batwa, Mbuti, and Baka territories as well as the rain force extending west into DRC.

Transnational companies such as Générale des quarries des Mines (Gécamines), with headquarters in China, the *Minière des Grands Lacs Africains* (MGL), headquartered in Belgium, and the Banro Corporation, headquartered in Toronto, Canada, are the active transnationals in eastern DRC. They benefit from the impoverished individual families digging in the soil for green energy minerals and, in turn, the export of these minerals that benefit companies such as Tesla, General Motors, General Electric, Volvo, Apple, Intel, and more.

A Park for Gorillas and Mining—not for ancestral Twa

Corporations and corrupt political officials exercise decisive influence over extracting raw materials from indigenous territories and so-called "protected" sites. The companies use front companies with 60% to 100% control to do the work on the ground while the initiating company and political officials in government directly benefit from earnings. Using front companies is common with mining activity in the Kahuzi-Biega National Park. In 1980, UNESCO designated this sorry situation a 'World Heritage Site,' further demonstrating the inability of state-based international organizations and governments to accommodate Indigenous nations. UNESCO and the DRC park authorities ignored and essentially trampled on the human rights law under international treaties and conventions to negotiate with indigenous nations according to the standard of free, prior, and informed consent (FPIC). Under FPIC, state and state-created bodies are required under international law to negotiate with indigenous nations if government administrative, legislative, or judicial policies and actions conflict with indigenous peoples' interests. The method exists, and the requirement is in place according to treaties and convention but is completely violated in the DRC and by UNESCO.

The Park authorities recognized in 2014 that the primary problem was that the Batwa had been forcibly made landless even as they retain a strong attachment to their ancestral lands. The state and companies promised to accommodate the Batwa, but the promises have been left unfulfilled.

Our Land Our Nature

The following is reprinted with permission from Dr. Deborah S. Rogers, President of Initiative for Equality (https://www.initiativeforequality.org/ originally published in https://www.initiativeforequality.org/protecting-people-protecting-nature/

In early September 2021, Survival International, Minority Rights Group and other NGOs convened a global conference *Our Land Our Nature* to assess this coercive, colonial model of conservation to promote green energy, based on separating people from their close relationship with nature. Indigenous people from Africa, Asia and Latin America spoke at the conference, along with researchers and activists who are looking for a more effective way to protect people and nature. The conference coincided with the corporate-funded International Union for the Conservation of Nature (IUCN) conference promoting a global increase in the amount of protected area. This is the so-called 30 x 30 plan (30% of the earth's surface protected by 2030). From the perspective of the speakers at the Our Land Our Nature conference, this would be a social, moral, and environmental catastrophe.

Julien Basimika, Coordinator of the Congolese group *Actions pour le Regroupement et l'Autopromotion des Pygmées* (ARAP), spoke at the *Our Land Our Nature* conference, reporting about his experiences and the harm that the Kahuzi Biega National Park has caused. (Click here to see his speech with English subtitles). Shockingly, this World Heritage Site, purchased in blood, did not result in greater protection for the endangered species or forest landscapes. Instead, the Park is now overrun with settlements, militias, mines, and charcoal operations. By driving out the indigenous inhabitants, the Park lands became a free-for-all of illicit and corrupt resource extraction – what Julien referred to as 'their mafia.'

So, Julien and his fellow activists at Kahuzi Biega are left to advocate for the impossible: agricultural development for people with no lands; human and cultural rights for people whose identity is tied to the land that has been taken; and conflict resolution between the Batwa and the Park when land is the only thing that could resolve the problem.

Following the September conference, a Manifesto was drawn up by the participants, proposing a better way to protect landscapes, biodiversity and people. Indigenous peoples, who currently control around 80% of the world's biodiversity, must become central participants in the process and empowered to find ways to protect these lands – as well as to meet their own needs. In fact, studies show that community-managed lands are better at protecting biodiversity than are "protected areas" devoid of people." "Thus in 1975, some 6,000 Twa, hunting and gathering people, were driven out and left to fend for themselves on the outskirts of the rural society. Given no compensation and no alternative lands, and with no access to economic resources, food security, modern education, or their traditional land-based culture, the Twa languished in abject poverty.

Fast forward to 2021: the situation is now worse, because conflict has developed, and nothing has been resolved. But the Twa are not alone. All over the world, "protected areas" have been grabbed and designated for conservation at the expense of the indigenous and other local communities. The reality in the Kahuzi-Biega National Park is that the very people—Batwa—whose stewardship over the millennia protected the biodiversity that makes these lands worth saving are the same people who were chased out, then shot as poachers if they attempted to return.

The three mining permits on which Kamituga town and its surrounding mining sites are located were acquired by Banro, a Canada-based multinational (Geenen, 2015). The Balega are the people in Kamituga working as artisanal and small-scale miners. Kamituga Mining Company mines copper, coltan, gold, cobalt, uranium, and coal in Kenya, Tanzania, DRC, Zambia, Zimbabwe, and South Africa. https://kamituga.com/#

Figure 4: Location of Kamituga Mining Company in eastern DRC

The Belgian company Minière des Grands Lacs Africains (MGL), or Great Lakes Mining Company, operated in Kamilgua mining gold until it merged into SOMINKI (Société Minière et Industrielle du Kivu). SOMINKI is a privately held company with eight other mining companies mining tin and then purchased by Banro Corporation of Canada, gaining the right to exploit gold mines. The mining companies in Kivu Province merged in three phases. First, the Cobelmin companies were unified into one company. Second, on 1 April 1974, Cobelmin began to administer Kivumines, Phibraki, and Somikubi as one while the legal arrangements were being sorted out. Mining, petroleum, and transnational agricultural corporations that engage in the extraction of green energy minerals and metals are primarily registered in the United States, Canada, South Africa, and Australia, and perhaps the largest and most influential corporation is in China (SEE Figure 5 location map below)

Figure 5: Transnational corporations and primary states' governments engaged in green energy extraction

International Human Rights Negligence: "Our Hands are Tied"

When the officials at the United Nations Organization Stabilization Mission's (MONUSCO) headquarters[17] at the United Nations in New York were directly challenged with not having protected the Batwa people in DRC, they said, "we know what's happening, but our hands are tied." Who has tied their hands, one might ask? Who runs the UN's Security Council? The states' governments either do not want to enforce the laws they create, or they accept the wealth from the crimes and turn their eyes away.

The perpetrators of crimes against the Twa are not only responsible for violence against human societies; but also for long-term damage

[17] MONUSCO is the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (the acronym is based on the French name) that was established by the UN Security Council resolutions 1279 and 1291 to monitor the peace process of the Second Congo War. However, though the agency turned to other conflicts (Ituri, Kivu, and the Dongo).

to the communities, environment, and cultural wellbeing. Such conditions demand substantial financial and legal liabilities for pollution, corruption, land grabs, destruction of cultures and communities, killings, etc.[18] The damages done by state government complicity, corporate negligence, and investor support must be documented by a team of experts on the ground.

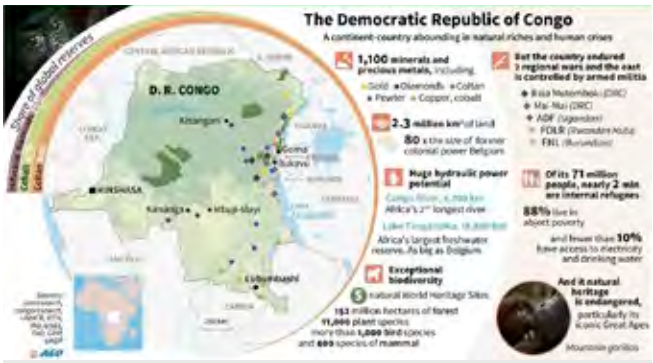

Figure 6: DR Congo peoples, land, raw materials, and biodiversity (Source: Agence France-Presse [AFP])

The investigative report must be delivered and prosecuted in a competent international criminal court for crimes committed against humanity. Independent international enforcement mechanisms must impose penalties on all the countries involved in the supply chain, all companies and their investors, and customers using the extracted resources. The independent international agency must calculate the size of the financial and other material responsibility based on the social and economic cost of restoring the communities and landscapes, including land and water, vegetation, and wildlife. This cost would be in the hundreds of billions, easily.

Punitive damages assessed against states, companies, and organizations involved in what must be assessed as crimes against humanity have an alternative. The alternative is to negotiate to settle conflicts and thereby ensure that indigenous nations are recognized as exercising full powers to grant consent to access their ancestral territories on terms they determine. The missing piece in the green-energy proposition is moderating, mediating, and negotiating territorial and resource access with environmental and climate regulations to benefit all parties.

ALDMEM – A Mediation and Negotiating Mechanism

I propose a plan to establish an "ancestral lands decolonization monitoring and enforcement mechanism" that facilitates negotiations enforced by third-party guarantor(s) to establish international treaties between affected indigenous nations, relevant states, and corporations to control access to indigenous territories and their resources. Some states, corporations, and many indigenous nations have "agreed" to the need to implement FPIC in matters involving administrative, legislative, and justiciar decisions that may adversely affect the interests of indigenous nations. However, no permanent international mechanism exists to facilitate constructive and enforceable arrangements between concerned parties. The state, corporations, and many nations currently emphasize the need to engage in "consultations" instead of obtaining indigenous nations consent. Consent establishes the necessary conditions for

[18] Kambale, Albert (2016) "DR Congo Christmas slaughter leaves 35 dead" Yahoo News December https://www.yahoo.com/news/13-civilians-killed-dr-congo-christmas-day-ethnic-115708222.html?soc_src=social-sh&soc_trk=pi

mutually determined negotiations. It balances the power relations between nations possessing ancestral territories and resources and the states and corporations seeking to access and extract those resources.

Christian Radu Chereji, Managing Director of the Conflict Studies Centre at the Babes-Bolyai University in Romania, suggests that "one of the major problems encountered by indigenous communities is their apparent lack of power to protect their lands." He points to different expressions of power, such as a "strong organization, knowledge of legal and technical aspects of the problems, and the capacity to communicate effectively and mobilize international public opinion."[19] He indicates that his Conflict Studies Center, the Center for World Indigenous Studies and other organization can supplement indigenous nations through capacity building technical assistance. Chereji suggests that more than 1000 corporations have reclaimed "social responsibility" as part of their "corporate profile," and must be brought to the table with indigenous nations. That action can press states' political players to join the table to establish a working mechanism to monitor, mediate and facilitate negotiations between concerned parties. It will be necessary, according to Chereji, "to work both ends—to make public consultation processes real and true instruments of decision-making regarding development projects and to make the indigenous communities powerful enough to be taken seriously"[20] for them to sit at the decision-making table with corporations and governments.

Therefore, this proposal:

Ancestral lands decolonization monitoring and enforcement mechanism (ALDMEM)

Through a cooperative agreement between nations, non-governmental organizations, willing states, and willing corporations establish a mechanism funded by independent sources to facilitate monitoring, negotiations, agreements, and enforcement of negotiated agreements concerning access to and exploitation of raw materials inside indigenous nations' ancestral territories based on the principle of free, prior and informed consent.

MISSION:

To monitor, mediate and facilitate negotiation of agreements (compacts, treaties, etc.) between nations, and corporations and states seeking to access ancestral territories and to use or extract resources for outside benefit.

GOALS:

- Register nation, state, corporate and purchaser parties seeking to use or extract resources from ancestral territories
- Establish mediation teams to facilitate conflict cession between competing nations seeking to control claimed lands and resources.

[19] Private communication to the author on 25 May 2022.

[20] IBID.

• Monitor existing territorial occupations and respond to nation requests for mediation between the nation and other parties

• Facilitate Third Party Guarantor participation of negotiations as an active party with a mutually determined role as monitor and enforcer of the final agreements.

• Notify prospective parties of the mediation and negotiation framework for establishing amicable relations between parties and offer venues for engagement

• Facilitate communications about customary governance of nations, structure of corporate, state and purchaser systems.

• Facilitate communications, translation, and customary languages to maximize understanding of engagement between parties.

• Conduct Public Affairs communications in symposiums, public media releases, public conferences, and documentary releases.

ORGANIZATION:

Director: Oversee and manage the organization

Monitoring Staff: Document, evaluate and track nation, corporate, state and purchaser activities in relation to ancestral territories worldwide. Maintain evaluation of existing relations, and document circumstances of relations between affected parties.

Diplomatic Staff: Engage state, nation, corporate and purchaser and multi-lateral parties to facilitate engagement. Facilitate Third Party Guarantors, observers and affected parties.

Communications Staff: Develop and maintain language, cultural, environmental, and geographic information to facilitate communications between nations, nations and states and corporation and research.

Mediation Staff: Directly engage parties in conflict and facilitate mutual understanding, rules for negotiations and consent and guarantees.

Public Affairs Staff: Develop and produce public information about engagement between nations, states, corporations, and purchasers.

Subject Matter Researchers: Nation negotiators of FPIC must have access to information and resources that include 1. Analysis of risks and benefits, 2. Roles and Responsibilities of all parties to agreements, 3. Governance Principles and Arrangements, 4. Social and environmental impact assessments, 5. Assessment of potential internal conflicts within the nation, 6. Evaluation standards for implementation of agreement, 7. Evaluation and validation of the standing of parties in negotiations, 8. Documentation of revenue streams, 9. Data, records, and knowledge base, 10. Domestic nation personnel and business participation, 11. Legal analysis, 12 Evaluation of Capacity of Parties.[21]

[21] These elements are derived from a reading of key considerations established by the First Nations LNG Alliance involving twenty-nine indigenous communities and 63 agreements concluded under FPIC with the Prince Rupert Gas Transmission; Coastal Gaslink; Pacific Trail Pipeline and the Westcoast Connector Gas Transmission project to build a gas pipeline across the territories of 29 first nations. https://benefits.fnlngalliance.com/critical-issues/

Framework for an FPIC Mechanism[22]

Each nation that enters an FPIC process must receive technical assistance and support to determine whether a company or companies and a state are allowed to access ancestral lands to develop and extract natural resources. Technical support and capacity building will help guarantee that it is possible to freely act as an equal negotiator.

There are no mechanisms for implementing human rights declarations or treaties except when the interests of competing entities find mutual benefit in implementation. Instead of "good faith" implementation is dependent on "good will." The absence of implementation and enforcement mechanisms in international and state laws[23] to directly protect nations from exploitation raises the question, "What are the options for establishing a mechanism that has the full capacity to ensure that nations are active parties in protecting their territories and communities and or controlling social, economic, and political forces that exploit peoples, resources and the environment for economic gain and power?"

The foundational principle in international law regarding the authority of indigenous nations is stated in UN General Assembly Resolution 1803[24], recognizing that sovereignty and self-government are foundational in international law as noted:

> The right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned.[25]

As the original peoples, indigenous nations reserve their authority over their lands, natural wealth and resources while states seek to exercise authority the same ancestral lands of nations. And Resolution 1803 makes clear that violations of the rights to the exercise of their sovereignty over natural resources and other wealth is inconsistent with the UN Charter.[26] Violations of such rights is contrary to the intent of international declarations, conventions, and treaties approved and ratified since the 1960s. These agreements guarantee indigenous nations the right to freely consent or reject administrative, legislative, or judicial actions that may be contrary to their interests.

Article 19 of the UN Declaration on the Rights of Indigenous Peoples and other provisions in the Declaration assert the necessity for state and nations to engage cooperatively regarding administrative, legislative, and judicial measures

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[22] Ryser, R., (2022) "A Framework for Implementing the Principle of Free, Prior and Informed Consent (FPIC) – Comity or Conflict." Fourth World Journal. Winter V21 N2 2022. p. 127

[23] In a recently released document entitled "Tribal Implementation Toolkit" (2022) designed for indigenous nations inside the United States to implement the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) the authors from the University of Colorado Law School, Native American Rights Fund and the University of California-Los Angeles Law School repeatedly note there are no enforcement mechanisms internationally to ensure conformity with the UNDRIP provisions.

[24] UNGA Resolution 1803 14 December 1962. "Permanent Sovereignty over Natural Resources." United Nations General Assembly.

[25] IBID. Paragraph 1.

[26] IBID. Paragraph 7.

that have the potential for adversely affecting the interests of nations. Similarly, the International Labor Organization Convention 169 (1989) contains provisions in article 16 regarding relocation of peoples by a state "only with the free and informed consent" of the indigenous peoples affected. The point is emphasized in article 6 of the Convention noting that engagements between states and nations "shall be undertaken, in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the proposed measures." In neither international instrument, nor in any other convention or declaration concerning indigenous nations are their provisions for enforcing the "requirement" of consent or agreement by nations except "good faith."

Exploitation of nations' ancestral territories and peoples by states, corporations and the purchasers of raw materials extracted from nations' territories accelerates and expands to more and more nations' lands. As mounting wealth and power of a few states grow there are calls for "green energy" to mitigate the damage growing worldwide. All entities concerned with stabilizing changing climate, reversing biodiversity collapse, preventing the destruction of indigenous peoples, and preventing the breakdown of human society worldwide must act to directly work through a mutually acceptable international mechanism that can ensure beneficial results for all parties. Establishing a new international mechanism with all contending parties seated at the table is an urgent matter.

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Dr. Rudolph C. Rÿser grew to maturity in the Cowlitz Indian culture on the US Pacific Northwest coast though he is of Cree/Oneida descent on his mother’s side and Swiss descent on his father’s. He earned his doctorate in international relations and has served as the Founding Chair of the Center for World Indigenous Studies since 1979. He is widely recognized around the world as the principle architect of theories and the practice of Fourth World Geopolitics. He is the author of the seminal book “Indigenous Nations and Modern States: The Political Emergence of Nations Challenging State Power” (2012), the Fourth World Geopolitical Reader and the currently released “Biodiversity Wars, Coexistence or Biocultural Collapse in the 21st Century” (2019). He has for more than fifty years worked in the field of Indian Affairs as a writer/researcher/ and advisor to political leaders of Fourth World nations throughout the world.

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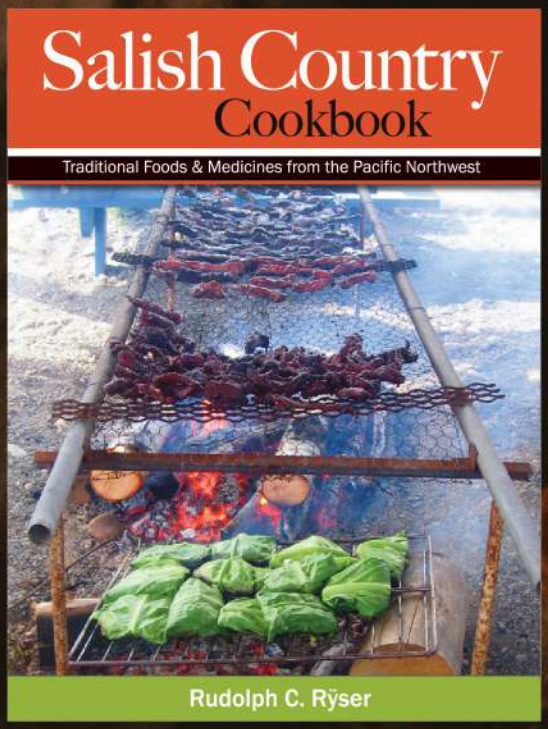

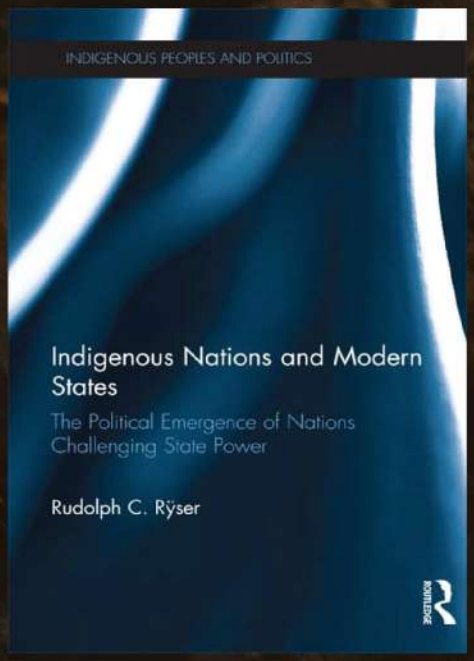

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—Erich Steinman, Pitzer College

PEER-REVIEWED

Minería de Energía Verde y Problemas de los Pueblos Indígenas

Negociar el Cambio de la Economía del Carbono a la Energía Verde con Consentimiento Libre Previo e Informado (CLPI)

Por Rudolph C. Rÿser, PhD
Presidente y Director Ejecutivo, Centro de Estudios Indígenas del Mundo
Traducción al Español por Aline Castañeda Cadena

RESUMEN

Los países de China, Estados Unidos, India, Rusia, Japón y Alemania emiten el 60% de los gases de carbono del mundo que provocan el cambio climático y la degradación de la biodiversidad. Al mismo tiempo, estos países y las empresas que crearon buscan obtener ganancias económicas considerables de la "Energía Verde" como reemplazo de la dependencia de la economía basada en el carbono. El gobierno estatal y las políticas empresariales promueven la extracción de metales como el oro, el tántalo y el litio, elementos clave necesarios para apoyar el desarrollo de reemplazos eléctricos para máquinas a base de petróleo como los automóviles. El problema explorado en este artículo es que, si bien la "energía verde" es un paso positivo hacia la reversión de los efectos adversos de la economía basada en el carbono, se causan daños catastróficos al medio ambiente y a los pueblos indígenas. La consiguiente explotación minera y de otros recursos del "reverdecimiento" destruye y contamina directamente el medio ambiente al mismo tiempo que fuerza violentamente la expulsión de los pueblos indígenas de sus territorios o incluso mata a miles de personas. La democratización de la minería y la explotación de otros recursos dentro de los territorios ancestrales de los pueblos indígenas es esencial y debe convertirse en el nuevo estándar, un estándar basado en obtener el consentimiento de los pueblos indígenas afectados. El autor presenta un plan de energía verde para mediar en las relaciones entre naciones indígenas, empresas y estados. La extracción y explotación de recursos de "energía verde" es una actividad económica dominante pero destructiva en la República Democrática del Congo (RDC), el segundo estado más grande del continente africano.

La República Democrática del Congo ilustra el problema como la mayor fuente de tantalio de "energía verde", un "metal refractario" extraído con litio esencial para producir condensadores, chips de computadora y semiconductores utilizados en tecnología eléctrica. El tantalio y el litio se extraen principalmente de los territorios de las naciones indígenas con consecuencias desastrosas.

Palabras clave: Twa, Mbuti, Balega, Tántalo, Litio, Oro

El costo de la energía verde

El impulso rápidamente acelerado de la "Energía Verde" por parte de los líderes políticos de los países de alta tecnología, sus compañías mineras y los productores de productos electrónicos para reducir o eliminar la dependencia de la energía del carbono ahora amenaza los territorios ancestrales biológicamente diversos de los pueblos indígenas en todo el mundo. Para lograr la transición a la energía verde sin crear nuevos daños al medio ambiente, democratizar y mediar en el cambio climático, regular la minería, la explotación de recursos y el desarrollo agrícola empresarial, los Estados, las empresas y las ONG deben garantizar de manera efectiva la aprobación de estas actividades por parte de las comunidades de pueblos indígenas.

Desde principios de la década de 1970, los científicos que estudian el clima y el medio ambiente han aumentado el volumen de sus alertas a los líderes políticos de que el desarrollo humano y especialmente la dependencia del petróleo se combinan para destruir la biodiversidad que sustenta la vida y cambiar el clima de manera cada vez más radical. Durante los años transcurridos desde las alertas iniciales, los gobiernos de los estados y las instituciones internacionales no lograron cambiar los comportamientos humanos que amenazan la vida en el planeta. Los líderes políticos y los esfuerzos organizados lanzaron esfuerzos en las dos primeras décadas del siglo XXI para promover la "energía verde" como la alternativa al desarrollo desenfrenado y la dependencia de los combustibles a base de carbono. "Energía verde" llama a la industria y los gobiernos a enfatizar el desarrollo de fuentes de energía renovable. Estas fuentes deben respaldar un giro hacia los automóviles eléctricos, los electrodomésticos de uso eficiente de la energía, el uso ampliado de paneles solares y electricidad generada por el viento, el uso de computadoras y otras tecnologías basadas en la electricidad. El enfoque de "energía verde" busca reducir las emisiones de carbono y lograr emisiones de carbono "netas cero". Más de 1000 empresas en todo el mundo se han comprometido a cero emisiones netas para lograr este objetivo para el año 2100. El cambio a la "energía verde" es una declaración poderosa para asegurar un clima saludable y una Tierra ambientalmente segura, excepto que el compromiso es solo una solución parcial al clima global y colapso ambiental necesarios.

El simple hecho de comprometerse sin hacer cumplir ese compromiso produce una publicidad beneficiosa, pero no resultados de "cero neto" o "energía verde". Las naciones indígenas, pequeñas y grandes, deben estar en la mesa de negociaciones con mediadores estatales, empresariales, ONG y efectivos para formalizar acuerdos que controlen y gestionen ambientalmente la extracción de recursos de las tierras ancestrales de los pueblos indígenas. De acuerdo con el derecho internacional formalizado bajo el principio de "consentimiento libre, previo e informado", las naciones indígenas deben ser reconocidas con pleno poder para consentir o rechazar el acceso a sus territorios. Las naciones indígenas, los estados, las empresas y las

ONG deben brindar mediación internacional. Deben proporcionar la aplicación de acuerdos negociados para maximizar los resultados beneficiosos que se esperan de las decisiones entre las partes interesadas.

Las naciones indígenas, los estados, las empresas, las organizaciones no gubernamentales y los productores comerciales tienen un interés creado en las negociaciones equitativas basadas en el consentimiento libre, previo e informado, democratizando las relaciones internacionales. La destrucción de las comunidades indígenas, el medio ambiente, el clima y, de hecho, toda la humanidad ahora depende de decisiones basadas en negociaciones justas y equitativas.

Después de revisar el ejemplo del fracaso de la minería y la agricultura empresarial en los territorios de los pueblos indígenas de la República Democrática del Congo, discutimos un marco para monitorear, negociar y hacer cumplir acciones corporativas seguras y responsables en la sección final de este artículo.

Cambiar a la tecnología eléctrica como se contempla ahora requiere establecer regulaciones, compromisos y controles extensos sobre las empresas que extraen materias primas de los territorios indígenas, las principales fuentes de minerales, metales y materiales esenciales para respaldar la fabricación de la nueva tecnología. Las naciones, los estados y las empresas deben instituir regulaciones internacionales a través de negociaciones que controlen empresas como Glencore, con sede en Suiza, y Générale des quarries des Mines (Gécamines), con sede en China, dos de las compañías mineras transnacionales más grandes del mundo. Empresas mineras de Suiza, China, Canadá y Estados Unidos excavan grandes pozos y canteras principalmente en territorios de pueblos indígenas para extraer materiales basados en tecnología eléctrica como cobre, aluminio, oro, tantalio, litio y cobalto. Fuera de la vista de la visión de la conciencia de las poblaciones urbanas que abogan por soluciones de “energía verde”, estas empresas, a menudo con la complicidad de funcionarios gubernamentales corruptos, empresas importadoras con fines de lucro como Toyota, Tesla, Intel, Apple y la fabricante de chips de computadora Gécamines—contribuyen a la destrucción y contaminación de vastas tierras, ríos y selvas tropicales, empobrecimiento de los pueblos indígenas y locales, forzar la expulsión de los pueblos indígenas de sus tierras ancestrales y contribuir a la trata de mujeres indígenas, el asesinato de miembros de las comunidades y mayor corrupción de los gobiernos.

En este artículo, discuto las consecuencias perjudiciales de la “energía verde” para los pueblos indígenas, sus vecinos, la tierra y la economía global. Esta discusión revela que si bien la “energía verde” presenta graves desventajas, es posible eliminar casi por completo los efectos adversos sobre las personas, la tierra y el clima. Al reconocer las tierras ancestrales de los pueblos indígenas como SU territorio y que deben aceptar los términos para ingresar al territorio y extraer materias primas, será posible emprender una “extracción limpia”. Los controles exigibles a las empresas y al Estado estipulados y acordados por los pueblos indígenas son esenciales. Un acuerdo negociado entre las comunidades indígenas y los

intereses empresariales y políticos que buscan el acceso al territorio y los recursos indígenas debe expresar plenamente el principio reconocido internacionalmente del consentimiento libre, previo e informado (CLPI). Examinamos en detalle los territorios indígenas, los materiales de "energía verde" y los recursos en la República Democrática del Congo, una fuente importante de estos materiales.

Tecnología "limpia" y los minerales necesarios

¿Qué pasa si el informe de la Organización Meteorológica Mundial (OMM)[1] que proyecta con 100% de certeza que la temperatura global promedio superará los 1,5 grados centígrados al menos durante un año dentro de los próximos cinco años resulta cierto: ningún lugar en la Tierra será seguro en un planeta que se calienta catastróficamente? Conservacionistas, ambientalistas, climatólogos y líderes políticos llaman a cambiar la dependencia del petróleo que provoca los cambios climáticos a componentes minerales para fabricar computadoras portátiles, teléfonos inteligentes, autos eléctricos y baterías. Podemos hacernos las preguntas: "¿Dónde están los minerales que harán que suceda la alternativa tecnológica al petróleo? ¿Qué minerales se necesitan para la tecnorrevolución? Bueno, dos minerales elementales comúnmente utilizados para fabricar teléfonos inteligentes, Xboxes, televisores, baterías, computadoras, automóviles eléctricos y otros dispositivos electrónicos es un mineral comúnmente llamado "coltán". Sin coltán, la capacidad de realizar comunicaciones digitales mediante Zoom y Skype sería imposible, y no existiría el equipo hospitalario diseñado para escanear el cuerpo de las personas para diagnosticar enfermedades.

Coltán es la expresión abreviada de columbita-tantalita, un mineral metálico extraído de los terrenos de la República Democrática del Congo. La minería se desarrolla principalmente en el Parque Nacional Kahuzi Biega, donde se encuentran las tierras ancestrales del pueblo Batwa y donde Dian Fossey Gorilla Fund International sigue trabajando en la protección de los gorilas.

La demanda de mineral de columbita-tantalita[2] es fundamental para el desarrollo comercial y gubernamental de tecnología dependiente de la electricidad destinada a reemplazar las economías basadas en el petróleo de los países de todo el mundo. El comentario popular es que la electricidad en apoyo de la tecnología es esencial para los dispositivos electrónicos, los nuevos modos de transporte, los satélites espaciales, los drones militares y los equipos hospitalarios, como los aparatos de rayos X y de cocina. Si bien todos queremos promover el desarrollo de nuevas tecnologías para revertir el daño ambiental causado a la tierra por la dependencia del petróleo, ¿de dónde creemos que provienen los minerales?

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[1] Actualización climática global anual a decenal de la OMM 2022 y 2022-2026. Organización Meteorológica Mundial. https://public.wmo.int/en/media/press-release/wmo-update-5050-chance-of-global-temperature-temporarily-reaching-15%C2%B0c-threshold#:~:text=the%20Global%20Annual%20to%20Decadal%20Climate%20Update%2C

[2] La columbita-tantalita, coltan para abreviar, es un mineral metálico gris que se encuentra en grandes cantidades en las zonas orientales del Congo. Después del procesamiento y la refinería, el coltán se convierte en tantalio en estado metálico. Entre sus propiedades se incluye la resistencia al calor, capaz de retener cargas metálicas relativamente altas.

Los minerales y metales tecnológicos contribuyen al daño ambiental a los suelos y las vías fluviales en parte debido a los desechos de subproductos de la minería y otros materiales y la alteración del medio ambiente natural y la salud de las comunidades cercanas y los hombres, mujeres y niños que extraen estos materiales. recursos. La minería contribuye a la deforestación cuando los árboles y la vegetación se talan y queman. La capa superior del suelo, la flora y la fauna son despojadas. Los minerales químicamente reactivos son inofensivos cuando están bajo tierra, pero cuando se extraen y se llevan a la superficie, a menudo reaccionan espontáneamente al oxígeno y al agua, lo que da como resultado ácidos e iones metálicos. El drenaje ácido de la mina es un riesgo después del cierre de las minas, incluso si la empresa minera lo almacena.

Las compañías mineras y los gobiernos no están dispuestos a gestionar los efectos adversos de los extractos de minerales y metales debido a los costos adicionales de remediación. La limpieza generalmente no está regulada y las consecuencias de la minería pueden ser desastrosas para las personas, el medio ambiente y el clima. Hay medidas para prevenir los daños causados por la minería que se pueden tomar. Pero para que la regulación efectiva entre en vigor, es necesario que las naciones indígenas, las empresas, los gobiernos y las comunidades participen en la creación de regulaciones y la aplicación adecuada, para garantizar resultados limpios.

Extracción de recursos y cambio climático

La electricidad, esa chispa de energía de tormenta que cae del cielo, se promociona como la solución a las necesidades energéticas modernas para eliminar los combustibles que generan gas de carbono que contribuyen al cambio climático como resultado de la actividad humana. Los países de China, Estados Unidos, Rusia, India, Japón, Canadá, Alemania, Corea del Sur y Brasil consumen el 64,1% del petróleo, gas natural y carbón no renovable del mundo. Seis de estos países generan el 60% de los gases de efecto invernadero del mundo: China (28%), Estados Unidos (15%), India (7%), Rusia (5%), Japón (3%)[3] , Alemania (2%). El carbón es el mayor generador de electricidad y produce la liberación de gas de carbono más importante.[4] Este simple recuento de productores de carbono es evidencia de que estos países son los principales contribuyentes a los altos niveles de gases de carbono en la atmósfera de la Tierra.

Ya están ocurriendo incendios desastrosos que destruyen pueblos y aldeas, sequías que eliminan la capacidad de cultivar alimentos, muertes debido al calor extremo, vendavales destructivos, inundaciones y más. El secretario general de la Organización Meteorológica Mundial, Petteri Taalas, declaró: “La cifra de 1,5

[3] Blokhin, Andriy. (2022) Invesgtopedia: https://www.investopedia.com/articles/investing/092915/5-countries-produce-most-carbon-dioxide-co2.asp

[4] IBID.

grados centígrados no es una estadística aleatoria. Es más bien un indicador del punto en el que los impactos climáticos serán cada vez más dañinos para las personas y para todo el planeta".[5] El autor del informe de la OMM, Mark Diesendorf, concluyó que es "simplemente imposible que la energía renovable alcance el objetivo en retirada". Él sugiere que es "¡demasiado tarde!" Sin embargo, los gobiernos, las industrias extractivas y los productores comerciales de dispositivos electrónicos, automóviles, baterías y otros equipos insisten en que deben explotar los territorios, los pueblos y el medio ambiente de las naciones indígenas en busca de minerales esenciales para respaldar la alternativa tecnológica.

Todos estos gobiernos están cambiando parte de su dependencia energética de los combustibles fósiles como su principal fuente de energía, especialmente para el transporte, a la electricidad generada por plantas de energía nuclear, paneles solares, generadores eólicos y condensadores y baterías de computadoras.

El gobierno de EE. UU., por ejemplo, promulgó una Ley de Inversión en Infraestructura y Empleos masiva en noviembre de 2021 para construir una red de carga de vehículos eléctricos en todo el país, mejorar las líneas eléctricas y promover la producción comercial de automóviles eléctricos y otros productos que dependen de la electricidad.

Los científicos del clima, ambientalistas y conservacionistas han recopilado amplia evidencia que demuestra que un cambio global masivo e inmediato de la energía basada en el petróleo a la energía eléctrica es un paso crítico necesario para enfrentar lo que ahora es una crisis del cambio climático. Los conservacionistas, los legisladores ambientales del gobierno y las empresas de electrónica comercial abogan ampliamente por la transición a la electrónica. Estas entidades son las principales defensoras de las baterías, los paneles solares, los generadores de electricidad eólica, los fabricantes de electrodomésticos, las plantas de energía nuclear, los vehículos terrestres y aéreos, el hardware militar (incluidos cohetes, vehículos terrestres, drones, satélites), las computadoras (incluidos iPads, iPhones , portátiles, etc.)

Una historia de saqueo económico de la República Democrática del Congo

Los sitios mineros en la República Democrática del Congo se encuentran en una de las regiones con mayor biodiversidad del mundo, con un poco más del 60% de las personas viviendo en áreas rurales. Más de la mitad de la población de la República Democrática del Congo de 89.562 millones no tiene acceso a agua potable, y menos del 1% de la población de las zonas rurales dispone de electricidad. Sus tierras son ricas en oro, diamantes, cobre y productos forestales comercialmente atractivos, incluidos la madera y el petróleo. En consecuencia, hombres, mujeres y niños individuales que trabajan como mineros "mano en la tierra" buscan ganar pequeñas cantidades de dinero para extraer minerales, elementos y gemas preciosas para las grandes empresas.

[5] Kolhatkar, S. (2022) " 'We know where we are headed': humanity is sacrificing itself on the altar of corporate profits." 14 de mayo, 2022. https://www.alternet.org/2022/05/humanity-sacrificing-itself-corporate-profits/

A pesar de la enorme riqueza obtenida de la extracción de materias primas por parte de una pequeña élite, la pobreza en el país es rampante y los pueblos indígenas en sus territorios sufren el desalojo de sus tierras y crímenes, incluido el genocidio. Los beneficiarios de esta abundancia son la clase política del estado y países alejados de África, incluidos China, Canadá, Suiza, Estados Unidos y el Reino Unido. Comprender las raíces complejas de la explotación humana y de los recursos en la República Democrática del Congo nos insta a promover la "energía verde" producida a partir de acuerdos negociados con las naciones indígenas como acción para poner fin a la violencia política, económica y humana.

Minería a pequeña escala

Los mineros "artesanales"[6] y de pequeña escala[7] (MAPE) se unen a las empresas mineras transnacionales en la extracción de gemas en bruto, minerales y materiales comercialmente buscados para la tecnología eléctrica de las tierras ancestrales de los pueblos indígenas como los batwa y los balega ubicados en Ituri, Norte Provincias de Kivu y Kivu del Sur en el este de la República Democrática del Congo. La minería a pequeña escala no es tan pequeña:

1. Se estima que a 150 millones de hombres, mujeres y niños se les paga a menudo menos que salarios de pobreza (y con frecuencia la esclavitud absoluta) para extraer minerales con sus manos y mano de obra para producir una porción importante del tantalio, estaño, oro y metales preciosos del mundo. gemas

2. ASM representa 80% Zafiros, 20% oro, 20% diamantes,

3. La minería a pequeña escala está mal regulada por las autoridades locales debido a la ausencia, la falta de un marco legal o la capacidad para hacer cumplir los marcos existentes.

4. La minería a pequeña escala en la República Centroafricana genera $ 114,7 millones en la economía,

5. Contaminación de las aguas subterráneas, se producen sumideros donde se derrumba el suelo superpuesto de la mina, la contaminación de los subproductos del suelo de la extracción de oro y otros metales liberados en los suelos socava la vegetación, la contaminación afecta negativamente al ecosistema local, modificando artificialmente la cantidad de vida silvestre.

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[6] Fritz, M. James, M., Collins, N., y Weldegiorgis, F. (2017). "Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues. Winnipeg. International Institute for Sustainable Development. "A pesar de su baja productividad, las cuentas de MAPE son una fuente importante de minerales y metales. Representa aproximadamente el 20 % del suministro mundial de oro, el 80 % del suministro mundial de zafiros y el 20 % del suministro mundial de diamantes. ASM también es un importante productor de minerales indispensables para la fabricación de productos electrónicos para la población, como computadoras portátiles y teléfonos... produciendo "el 26 por ciento del tantalio global y el 25 por ciento del estaño". En muchos países, del 70 al 80 por ciento de los mineros en pequeña escala son trabajadores informales que producen "impactos socioeconómicos, ambientales y de salud dañinos, que atrapan a la mayoría de los mineros y las comunidades en ciclos de pobreza y los excluyen de la protección y el apoyo legales".

[7] Walser, G. (2019) "Economic impact of world mining." World Bank Group Mining Department, Washington D.C., USA. IAEA-SM-362/7. Según el Banco Mundial, "la minería a pequeña escala es "una actividad impulsada por la pobreza" que proporciona ingresos mínimos a aproximadamente 13 millones de hombres y mujeres, mientras que el Banco reconoce que la minería realizada por mineros a pequeña escala contribuye al daño ambiental, la descomposición social, y minería de minerales conflictivos: contrabando de minerales con fines lucrativos.

6. ASM: las instalaciones de compra y refinación de minería de oro se encuentran en 55 países, pero son una causa importante de la contaminación por mercurio.

7. La MAPE para el oro es la mayor fuente de emisiones antropógenas de mercurio al medio ambiente de cualquier sector a nivel mundial, seguida por la combustión del carbón y los metales no ferrosos.

8. Las altas dosis de mercurio pueden afectar los trastornos neurológicos y del comportamiento, las enfermedades cardiovasculares, la presión arterial alta, el deterioro de la visión periférica, el deterioro de los riñones y prácticamente no se brinda asistencia médica a los mineros en pequeña escala.

9. Soluciones opcionales del Banco Mundial: a. fomentar las aspiraciones económicas y sociales locales, creando un entorno de convivencia a través del empleo, b. Formación profesional para hacer una carrera profesional, c. establecer una estructura que incluya un organismo autorizado para mantener buenos entornos de trabajo, derechos y prácticas.

Como informó la organización Greenpeace en su informe de 2004 sobre la deforestación en la cuenca del Congo, incluida la República Democrática del Congo:

> Desde el punto de vista económico, la región sigue siendo pobre y endeudada: a pesar de sus importantes reservas e ingresos petroleros, combinados con madera, diamantes, oro y otros minerales, todos los países se clasifican entre los 'moderadamente endeudados' (Camerún) o entre los 'severamente endeudados' (todos los otros países) categorías del Banco Mundial. Si bien la situación puede parecer paradójica, se explica en gran medida por el patrimonialismo estatal y la persistencia de "economías de saqueo": la apropiación de bienes públicos por parte de los 'servidores' públicos y sus socios privados, raramente manejados en función del interés público sino más bien por ganancias privadas.

Las riquezas fueron los primeros objetivos después de la llegada de los portugueses en 1482, que se deleitaron con el comercio de esclavos humanos de ambos lados de la desembocadura del río Congo durante los siguientes 300 años durante el surgimiento de la Federación Kuba en lo que ahora es el sur del Congo. El rey Leopoldo II de Bélgica comenzó sus esquemas de colonización a principios de la década de 1870, seguido por el establecimiento del Estado Libre del Congo bajo su control directo. La Federación Kuba luchó violentamente para resistir la trata de esclavos de Bélgica y la explotación desenfrenada de caucho, marfil y madera. Para 1908, Leopold se ve obligado a renunciar al control de los pueblos y el territorio, dejando atrás la expulsión y el asesinato de aproximadamente 10 millones de personas. Bélgica continuó la explotación de tierras, recursos y personas al instituir regímenes de trabajo forzado y luego robar el tesoro justo antes de que se ganara la independencia en 1960. Bélgica continuó interfiriendo en los asuntos internos de la región buscando el control de grandes depósitos de cobre y con los supuestos esfuerzos fallidos de la Agencia Central de

Inteligencia del gobierno estadounidense facilitó el asesinato del líder electo del país Lumumba. A lo largo de las décadas siguientes, los forasteros iniciaron y sofocaron guerras[8] que buscaban obtener el control de los ricos recursos para la exportación comercial a través de los países vecinos.

Minerales de conflicto

Los minerales, metales y piedras preciosas de la energía basada en el carbono y la energía verde están en el centro de conflictos violentos que involucran a pequeños mineros del estado/comunidad indígena/comunidad local, empresas en disputa con pequeños mineros locales, tráfico de minerales y personas, y traslados forzosos de población que involucran milicias, pueblos indígenas, medio ambiente. Las empresas mineras transnacionales, los gobiernos de los estados y los estados importadores están todos atrapados en confrontaciones violentas. Los conflictos violentos en los territorios ancestrales de naciones indígenas con abundantes riquezas naturales son blancos convenientes para los estados y las empresas transnacionales.

Si bien los líderes políticos estatales y los ejecutivos empresariales codician condiciones estables en los territorios de los pueblos indígenas que incluyen una riqueza natural considerable, los territorios inestables son valiosos. Las autoridades gubernamentales pueden invocar los poderes policiales del estado para promover los intereses empresariales.[9] Surgen conflictos entre los mineros en pequeña escala que compiten y las comunidades que viven cerca de los sitios mineros. En la República Democrática del Congo, el gobierno desplegó casi 800 soldados para atacar a sus ciudadanos y sacar por la fuerza a 10 000 mineros artesanales de una de sus minas de cobre y cobalto más grandes: la mina Tenke Fungurume (TFM) y destruyó la pequeña aldea de Kafwaya en el proceso. La República Democrática del Congo también apoyó la expulsión de 20.000 mineros artesanales en la mina Kamoto Copper Company de Glencore. Cuanto mayor es la violencia, "menos opciones de medios de vida" para las personas, hombres, mujeres y niños que trabajan en la minería a pequeña escala para evitar las consecuencias de la pobreza generalizada.[10]

En Estados Unidos, el gobierno está trabajando con la empresa Perpetua Resources para desarrollar una gran mina de oro a cielo abierto que produciría 115 millones de libras de antimonio en los territorios de Nimiipuu[11] (Estado de Idaho). El antimonio[12] es un elemento crítico

[8] El gobierno hutu de Ruanda orquestó un genocidio de tutsis y hutus moderados en 1994 y, cuando fueron derrotados, más de un millón de hutu se refugiaron al otro lado de la frontera (incluidos muchos de los líderes del genocidio en Zaire, el área llamada así desde 1971 hasta 1997 que se convirtió en la República Democrática de el Congo). El nuevo gobierno congoleño instalado por las milicias ruandesas bloqueó los esfuerzos de la ONU para proteger a los hutu que continuaban huyendo hacia el interior. La milicia ruandesa pasó a llamarse Ejército para la Liberación de Ruanda (ALIR) con miembros dentro y fuera del Congo.

[9] Rigternink, A., and DeCaires Gall, K., Octubre 27, 2020. "The Future of Conflict Mining." Political Violence at a Glance." Revista en línea.

[10] IBID.

[11] Nez Percé es el nombre dado a las "tierras reservadas" de los Nimiipuu—el nombre que se dan a ellos mismos. Nez Percé es un vocablo de origen francés que significa "nariz perforada." Nimiipuu tiene una población actual de más de 3,500.

[12] El antimonio se identifica en la tabla de elementos con el número atómico 52. Es un metaloide gris que se encuentra principalmente como el mineral de sulfuro estibina.

para la fabricación de baterías de metal líquido de alta capacidad. La compañía Nevada Lithium se está preparando para comenzar una mina de litio de 1000 acres en el territorio de Paiute y Shoshone para extraer el elemento para baterías de automóviles eléctricos.[13]

Los conflictos en los estados de Indonesia (Papúa Occidental), Birmania (es decir, Shan, Mon, Karen), Irak (es decir, Ezidikhan, Al-Dulaimi, Kurdistán), Brasil, Sudán y la República Democrática del Congo son rampantes. Los actos de ataques criminales contra los pueblos indígenas por parte de los pueblos indígenas se asocian comúnmente con disputas por la tierra y la extracción de los llamados minerales y metales de energía verde. Los banyarwanda (colonos tutsi y hutu de Ruanda y Uganda empujados violentamente al este de la República Democrática del Congo en la década de 1990 por el genocidio de Ruanda y concursos similares en Uganda) se apropiaron de las tierras ancestrales de los hunde, nyanga y nande en el este de la República Democrática del Congo. Para recuperar el control de sus tierras, los miembros de las tres tribus formaron milicias para expulsar a los tutsis y a los hutus considerados invasores. Bajo el apodo de "Mai Mai", los grupos armados se convirtieron en fuerzas de resistencia en oposición a lo que consideran comunidades de inmigrantes y personas de etnia ruandesa. Sus agendas van desde la defensa de su tierra para controlar los recursos hasta la extorsión, los impuestos ilegales y el bandolerismo. Los Banyarwanda formaron grupos armados contrarios que atacan violentamente a los grupos Mai Mai y tienen su propia agenda para recaudar dinero a través de la extorsión, el tráfico y el contrabando de minerales a Ruanda, donde los compradores ansiosos por revender los minerales de energía verde a empresas en los Estados Unidos, Canadá, Reino Unido y China.

Female fighters from a Mai Mai group in North Kivu, DRC. Photo: Matchbox Media Collective.

Figura 1. Tropa de Mai Mai

Los Karen, Shan, Mon, Kachin, Rohingya y otros en Birmania están involucrados en un gran conflicto con la empresa militar criminal Tatmadaw. El Tatmadaw, el 1 de febrero de 2021, tomó el control de los territorios de todas las naciones y sus minerales, gemas preciosas y recursos petroleros. El país conocido durante mucho tiempo como Birmania incluye más de 135 naciones indígenas diferentes con territorios ancestrales que cubren todo el país. Aunque muchas naciones indígenas, Chin, Kachin, Kayin, Kayah, Mon, Rakhine, Bamar y Shan son nombres ampliamente utilizados para agrupar a las muchas naciones, aunque Hani, Khun, Wa, Palaung y muchos otros también pueden citarse cuando se trata de tierras ancestrales. Numerosas empresas transnacionales pagan

[13] Healy, J., Baker, M., 27 de diciembre, 2021, "As Miners Chase Clean-Energy Minerals, Tribes Fear a Repeat of the Past." New York Times.) (Golden, Hallie., 15 de octubre, 2021. Tribus indígenas trataron de bloquear una mina de vaterías para autos, pero las cortes se interpusieron en el camino." The Guardian.

dinero directamente al Tatmadaw para continuar con la minería. Estas empresas incluyen Sino Exploration & Mining Company of China y Tegiva Mining Company Ltd, registrada en Accra, Ghana. Otras empresas incluyen Mustafa Rivers and Mining Company, registrada en los Estados Unidos, y otra empresa de China, Shanghai Kadi Metal Mining Co., Ltd. Muchas de estas empresas están registradas en el Pacto Mundial de las Naciones Unidas, comprometiéndose a respetar y cumplir por diez principios. Sin embargo, estas empresas son cómplices directas del desplazamiento y asesinato de varios miles de indígenas por parte del Tatmadaw.

Las milicias del gobierno iraquí y el gobierno regional kurdo han tomado el control de los recursos de petróleo y gas dentro del territorio de Ezidikhan (Yezidi) y el territorio de la Confederación Al-Dulaimi por parte del gobierno regional kurdo y los militares del gobierno iraquí. La disputa a largo plazo por el control de Papúa Occidental (desde 1949) en Indonesia, donde se ubicaban las concesiones mineras de las empresas transnacionales, resultó en la dislocación y represión de los pueblos papúes por parte del ejército indonesio. Las minas de cobre y oro despejaron y contaminaron áreas forestales significativas en las montañas Erstberg y Grasberg, la región de los lagos Paniai y Wissel, Fak Fak, el valle de Baliem y el área fronteriza junto a Papúa Nueva Guinea, lo que resultó en la dislocación y la supresión de los papúes. pueblos por el ejército de Indonesia.[14] Como ilustra el mapa de la República Democrática del Congo en la Figura 2, los minerales críticos de cobalto, tantalio y litio se extraen de los territorios de Hunde, Nyanga, Nande y Twa y el tráfico está estrechamente asociado con Ruanda y Uganda.

Figura 2. La República Democrática del Congo es ahora el mayor productor mundial de tantalio, un mineral de conflicto, con Brasil en segundo lugar, seguido de Ruanda, Nigeria y China.

Negociando el Consentimiento Libre, Previo e Informado de los Twa

Los administradores del Parque Nacional Kahuzi Biega se vieron obligados a negociar con los Batwa para mitigar las consecuencias adversas de la "expansión de la conservación" del parque. Aunque los Batwa habían vivido en sus tierras ancestrales mucho antes de que se creara la República Democrática del Congo; y habían sido expulsados por la fuerza de su territorio. El Programa de Pueblos del Bosque, con sede en Inglaterra (info@forestpeoples.org) intentó facilitar un diálogo entre el Parque Nacional Kahuzi-Biega en Kivu del Sur y las comunidades Batwa que viven alrededor del parque. Debido a que las autoridades del Parque no mostraron "disposición a cumplir ninguno

[14] "Mining." https://www.cs.utexas.edu/users/cline/papua/mines.htm

de los compromisos que habían hecho con las comunidades en discusiones anteriores y, en cambio, han tomado el camino de la violencia y la intimidación para mantener a la gente batwa fuera del Parque por la fuerza",[15] el Programa de Pueblos del Bosque se retiró. desde su papel de mediador. Las negociaciones colapsaron porque no hubo un mecanismo de mediación ni cumplimiento de ningún acuerdo. Discutimos un enfoque alternativo a continuación que puede haber resultado exitoso.

Corrupción, Milicias y Masacres

El este de la República Democrática del Congo tiene más de 70 grupos armados independientes originarios de Ruanda y Uganda.[16] Estos grupos se aseguran de obtener su parte de los minerales y de mantener el flujo de minerales traficados que cruzan la frontera. Los Tutsi Banyamulenge habían emigrado de lo que ahora es Ruanda a la ciudad congoleña de Mulenge más de 100 años antes. Las autoridades congoleñas impugnaron su ciudadanía en la República Democrática del Congo. Este desafío condujo a insurgencias que se han convertido en milicias tutsis de contrabando que transportan minerales a través de la frontera hacia Ruanda. El contrabando de estos y otros grupos constituye una industria tan vasta, tan lucrativa, que los gobiernos de Uganda y Ruanda apoyan las milicias y el tráfico. En última instancia, la Unión Europea y los Estados Unidos, los principales clientes de estos minerales (para la energía "verde"), hacen la vista gorda ante la violencia y las empresas criminales. El tráfico exitoso de valiosos minerales de energía verde parece ser la razón por la cual Estados Unidos respalda al presidente Paul Kagame, el violador autoritario de los derechos humanos en Ruanda.

Los pueblos indígenas y los pueblos vinculados a la República Democrática del Congo son sacados a la fuerza de los sitios mineros y son asesinados todo el tiempo en estos conflictos solo porque estorban. Pero los Twa (Batwa se usa indistintamente con Twa) en la provincia de Tanganyika, más al sur, también han sufrido ataques y traslados forzados. es una crisis Cuando EE. UU. y la Unión Europea compran los minerales de energía verde de Ruanda y Uganda, minerales que se originan en la República Democrática del Congo, pueden pretender no tener conocimiento de la empresa criminal.

Figura 3. Ituri y Tanganyika - Centros de violencia y extracción de recursos

[15] https://www.forestpeoples.org/index.php/es/node/50518

[16] Los ejércitos de Ruanda y Uganda y otros países africanos han seguido participando en la violencia en el este de la República Democrática del Congo sirviendo en parte como traficantes de los ricos recursos hacia Ruanda y Uganda extraídos de los territorios batwa, mbuti y baka, así como la fuerza de la lluvia que se extiende hacia el oeste hacia la República Democrática del Congo.

Empresas transnacionales como Générale des quarries des Mines (Gécamines), con sede en China, Minière des Grands Lacs Africains (MGL), con sede en Bélgica, y Banro Corporation, con sede en Toronto, Canadá, son las transnacionales activas en el este de la República Democrática del Congo. Se benefician de las familias individuales empobrecidas que cavan en el suelo en busca de minerales de energía verde y, a su vez, de la exportación de estos minerales que benefician a empresas como Tesla, General Motors, General Electric, Volvo, Apple, Intel y más.

Un parque para los gorilas y la minería, no para los ancestrales twa

Las empresas y los funcionarios políticos corruptos ejercen una influencia decisiva sobre la extracción de materias primas de los territorios indígenas y los llamados sitios "protegidos". Las empresas utilizan empresas fachada con un control del 60 % al 100 % para hacer el trabajo sobre el terreno, mientras que la empresa iniciadora y los funcionarios políticos del gobierno se benefician directamente de las ganancias. El uso de empresas fachada es común en la actividad minera en el Parque Nacional Kahuzi-Biega. En 1980, la UNESCO designó esta lamentable situación como "Patrimonio de la Humanidad", lo que demuestra aún más la incapacidad de los gobiernos y las organizaciones internacionales estatales para acomodar a las naciones indígenas. La UNESCO y las autoridades del parque de la República Democrática del Congo ignoraron y esencialmente pisotearon la ley de derechos humanos en virtud de los tratados y convenciones internacionales para negociar con las naciones indígenas de acuerdo con el estándar de consentimiento libre, previo e informado (CLPI). Bajo el CLPI, los organismos estatales y creados por el estado están obligados según el derecho internacional a negociar con las naciones indígenas si las políticas y acciones administrativas, legislativas o judiciales del gobierno entran en conflicto con los intereses de los pueblos indígenas. El método existe y el requisito está establecido de acuerdo con los tratados y convenciones, pero se viola por completo en la República Democrática del Congo y por la UNESCO.

Las autoridades del Parque reconocieron en 2014 que el principal problema era que los Batwa habían sido obligados a quedarse sin tierras a pesar de que conservan un fuerte apego a sus tierras ancestrales. El estado y las empresas prometieron dar cabida a los batwa, pero las promesas no se han cumplido.

Nuestra Tierra Nuestra Naturaleza

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A principios de septiembre de 2021, Survival International, Minority Rights Group y otras ONG convocaron una conferencia mundial Our Land Our Nature para evaluar este modelo coercitivo y colonial de conservación para promover la energía verde, basado en separar a las personas de su estrecha relación con la naturaleza. Indígenas de África, Asia y América Latina hablaron en la conferencia, junto con investigadores y activistas que buscan una forma más efectiva de proteger a las personas y la naturaleza. La conferencia coincidió con la conferencia de la Unión Internacional para la Conservación de la Naturaleza (UICN), financiada por empresas, que promueve un aumento global en la cantidad de áreas protegidas. Este es el llamado plan 30 x 30 (30% de la superficie terrestre protegida para 2030). Desde la perspectiva de los oradores de la conferencia Nuestra Tierra Nuestra Naturaleza, esto sería una catástrofe social, moral y ambiental.

Julien Basimika, coordinador del grupo congoleño Actions pour le Regroupement et l'Autopromotion des Pygmées (ARAP), habló en la conferencia Our Land Our Nature, informando sobre sus experiencias y el daño que ha causado el Parque Nacional Kahuzi Biega. Haga clic aquí para ver su discurso con subtítulos en inglés). Sorprendentemente, este Patrimonio de la Humanidad, comprado con sangre, no resultó en una mayor protección para las especies en peligro de extinción o los paisajes forestales. En cambio, el parque ahora está invadido por asentamientos, milicias, minas y operaciones de carbón. Al expulsar a los habitantes indígenas, las tierras del Parque se convirtieron en un campo de extracción de recursos ilícitos y corruptos, lo que Julien denominó "su mafia".

Entonces, Julien y sus compañeros activistas en Kahuzi Biega se quedan para abogar por lo imposible: desarrollo agrícola para personas sin tierras; derechos humanos y culturales de las personas cuya identidad está ligada a la tierra arrebatada; y resolución de conflictos entre los Batwa y el Parque cuando la tierra es lo único que podría resolver el problema.

Después de la conferencia de septiembre, los participantes redactaron un Manifiesto, proponiendo una mejor manera de proteger los paisajes, la biodiversidad y las personas. Los pueblos indígenas, que actualmente controlan alrededor del 80 % de la biodiversidad del mundo, deben convertirse en participantes centrales del proceso y estar empoderados para encontrar formas de proteger estas tierras, así como para satisfacer sus propias necesidades. De hecho, los estudios muestran que las tierras administradas por la comunidad son mejores para proteger la biodiversidad que las "áreas protegidas" desprovistas de personas". "Así, en 1975, unos 6.000 twa, cazadores y recolectores, fueron expulsados y abandonados a su suerte en las afueras de la sociedad rural. Sin compensación ni tierras alternativas, y sin acceso a recursos económicos, seguridad alimentaria, educación moderna o su cultura tradicional basada en la tierra, los twa languidecieron en la pobreza más abyecta.

Avance rápido hasta 2021: la situación ahora es peor, porque se ha desarrollado un conflicto y no se ha resuelto nada. Pero los twa no están solos. En todo el mundo, se han tomado y designado "áreas protegidas" para la conservación a expensas de las comunidades indígenas y otras comunidades locales. La realidad en el Parque Nacional Kahuzi-Biega es que las mismas personas—Batwa—cuya administración durante milenios protegió la biodiversidad que hace que valga la pena salvar estas tierras son las mismas personas que fueron expulsadas y luego fusiladas como cazadores furtivos si intentaban regresar.

Banro, una multinacional con sede en Canadá, adquirió los tres permisos mineros en los que se encuentran la ciudad de Kamituga y los sitios mineros circundantes (Geenen, 2015). Los Balega son las personas de Kamituga que trabajan como mineros artesanales y de pequeña escala. Kamituga Mining Company extrae cobre, coltán, oro, cobalto, uranio y carbón en Kenia, Tanzania, República Democrática del Congo, Zambia, Zimbabue y Sudáfrica. https://kamituga.com/#

Figura 4. Ubicación de la Empresa Minera Kamituga al este de República Democrática del Congo

La empresa belga Minière des Grands Lacs Africains (MGL), o Great Lakes Mining Company, operó en Kamilgua extrayendo oro hasta que se fusionó con SOMINKI (Société Minière et Industrielle du Kivu). SOMINKI es una empresa privada con otras ocho empresas mineras que extraen estaño y luego fue comprada por Banro Corporation de Canadá, obteniendo el derecho a explotar minas de oro. Las empresas mineras de la provincia de Kivu se fusionaron en tres fases. Primero, las empresas Cobelmin se unificaron en una sola empresa. En segundo lugar, el 1 de abril de 1974, Cobelmin comenzó a administrar Kivumines, Phibraki y Somikubi como uno solo mientras se resolvían los arreglos legales. Las empresas transnacionales de minería, petróleo y agricultura que se dedican a la extracción de minerales y metales de energía verde están registradas principalmente en los Estados Unidos, Canadá, Sudáfrica y Australia, y quizás la empresa más grande e influyente esté en China (VER Figura 5 mapa de ubicación a continuación).

Figura 5. Empresas transnacionales y gobiernos de estados principales que participant en la extracción de energía verde

Negligencia internacional en derechos humanos: “nuestras manos están atadas”

Cuando los funcionarios de la sede de la Misión de Estabilización de la Organización de las Naciones Unidas (MONUSCO)[17] en las Naciones Unidas en Nueva York fueron cuestionados directamente por no haber protegido al pueblo batwa en la República Democrática del Congo, dijeron: “sabemos lo que está pasando, pero tenemos las manos atadas”. ¿Quién les ha atado las manos, uno podría preguntarse? ¿Quién dirige el Consejo de Seguridad de la ONU? Los gobiernos de los estados o no quieren hacer cumplir las leyes que crean, o aceptan la riqueza de los delitos y apartan la vista.

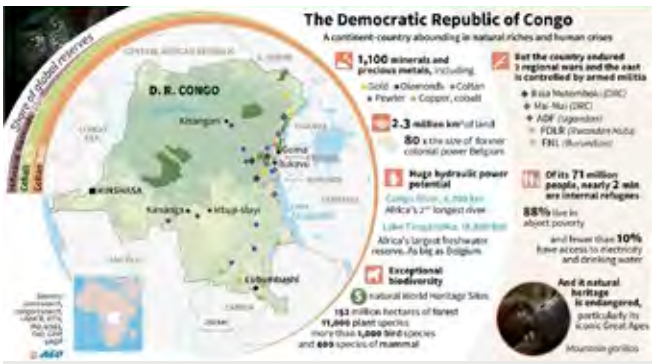

Figura 6. Pueblos de la República Democrática del Congo, la tierra, materias primas, y biodiversidad (Fuente: Agence France-Presse [AFP])

Los perpetradores de crímenes contra los twa no solo son responsables de la violencia contra las sociedades humanas; sino también por daños a largo plazo a las comunidades, el medio ambiente y el bienestar cultural. Tales condiciones exigen responsabilidades financieras y legales sustanciales por contaminación, corrupción, acaparamiento de tierras, destrucción de culturas y comunidades, asesinatos, etc.[18] Los daños causados por la complicidad del gobierno estatal, la negligencia empresarial y el apoyo de los inversores deben ser documentados por un equipo de expertos sobre el terreno. El informe de investigación debe ser entregado y juzgado en un tribunal penal internacional competente por crímenes de lesa humanidad. Los mecanismos de aplicación internacionales independientes deben imponer sanciones a todos los países involucrados en la cadena de suministro, todas las empresas y sus inversores, y los clientes que utilizan los recursos extraídos. La agencia internacional independiente debe calcular el tamaño de la responsabilidad financiera y material en función del costo social y económico de restaurar las comunidades y los paisajes, incluidos la tierra y el agua, la vegetación y la vida silvestre. Este costo sería de cientos de miles de millones, fácilmente.

Los daños punitivos evaluados contra Estados, empresas y organizaciones involucradas en lo que debe ser evaluado como crímenes de lesa humanidad tienen una alternativa. La alternativa es negociar para resolver los conflictos y así asegurar que las naciones indígenas sean reconocidas en el ejercicio de plenos poderes para otorgar consentimiento para acceder a

[17] MONUSCO es la Misión de Estabilización de la Organización de las Naciones Unidas en la República Democrática del Congo (el acrónimo se basa en el nombre en francés) que fue establecida por las resoluciones 1279 y 1291 del Consejo de Seguridad de la ONU para monitorear el proceso de paz de la Segunda Guerra del Congo. Sin embargo, aunque la agencia recurrió a otros conflictos (Ituri, Kivu y Dongo).

[18] Kambale, Albert (2016) “DR Congo Christmas slaughter leaves 35 dead” Yahoo News December https://www.yahoo.com/news/13-civilians-killed-dr-congo-christmas-day-ethnic-115708222.html?soc_src=social-sh&soc_trk=pi

sus territorios ancestrales en los términos que ellos determinen. La pieza que falta en la propuesta de energía verde es moderar, mediar y negociar el acceso territorial y a los recursos con regulaciones ambientales y climáticas para beneficiar a todas las partes.

ALDMEM – Un Mecanismo de Mediación y Negociación

Propongo un plan para establecer un "mecanismo de monitoreo y cumplimiento de la descolonización de tierras ancestrales" que facilite las negociaciones impuestas por terceros garantes para establecer tratados internacionales entre las naciones indígenas afectadas, los estados relevantes y las empresas para controlar el acceso a los territorios indígenas y su recursos. Algunos estados, empresas y muchas naciones indígenas han "acordado" la necesidad de implementar el CLPI en asuntos que involucran decisiones administrativas, legislativas y judiciales que pueden afectar negativamente los intereses de las naciones indígenas. Sin embargo, no existe ningún mecanismo internacional permanente para facilitar acuerdos constructivos y exigibles entre las partes interesadas. El estado, las empresas y muchas naciones actualmente enfatizan la necesidad de participar en "consultas" en lugar de obtener el consentimiento de las naciones indígenas. El consentimiento establece las condiciones necesarias para negociaciones mutuamente determinadas. Equilibra las relaciones de poder entre las naciones que poseen territorios y recursos ancestrales y los estados y empresas que buscan acceder y extraer esos recursos.

Christian Radu Chereji, Director Gerente del Centro de Estudios de Conflictos de la Universidad Babes-Bolyai en Rumania, sugiere que "uno de los principales problemas que enfrentan las comunidades indígenas es su aparente falta de poder para proteger sus tierras". Señala diferentes expresiones de poder, como una "organización fuerte, conocimiento de los aspectos legales y técnicos de los problemas, y la capacidad de comunicar de manera efectiva y movilizar a la opinión pública internacional".[19] Indica que su Centro de Estudios de Conflictos, el Centro de Estudios Indígenas Mundiales y otras organizaciones pueden complementar a las naciones indígenas a través de la asistencia técnica para el desarrollo de capacidades. Chereji sugiere que más de 1000 empresas han reclamado la "responsabilidad social" como parte de su "perfil empresarial" y deben sentarse a la mesa con las naciones indígenas. Esa acción puede presionar a los actores políticos de los estados a unirse a la mesa para establecer un mecanismo de trabajo para monitorear, mediar y facilitar las negociaciones entre las partes interesadas. Será necesario, según Chereji, "trabajar en ambos extremos: hacer de los procesos de consulta pública verdaderos y verdaderos instrumentos de toma de decisiones sobre proyectos de desarrollo y hacer que las comunidades indígenas sean lo suficientemente poderosas para ser tomadas en serio"[20] para que se sienten en la mesa de toma de decisiones con empresas y gobiernos.

[19] Private communication to the author on 25 May 2022.

[20] IBID.

Por lo tanto, esta propuesta:

Mecanismo de seguimiento y aplicación de la descolonización de tierras ancestrales (ALDMEM)

A través de un acuerdo de cooperación entre naciones, organizaciones no gubernamentales, estados dispuestos y empresas dispuestas a establecer un mecanismo financiado por fuentes independientes para facilitar el seguimiento, las negociaciones, los acuerdos y el cumplimiento de los acuerdos negociados sobre el acceso y la explotación de materias primas dentro de las naciones indígenas. territorios ancestrales con base en el principio del consentimiento libre, previo e informado.

MISIÓN:

Supervisar, mediar y facilitar la negociación de acuerdos (pactos, tratados, etc.) entre naciones, empresas y estados que buscan acceder a territorios ancestrales y utilizar o extraer recursos para beneficio externo.

METAS:

- Registro de partes nacionales, estatales, y empresariales que pretendan utilizar o extraer recursos de territorios ancestrales
- Establecer equipos de mediación para facilitar la cesión de conflictos entre naciones competidoras que buscan controlar las tierras y los recursos reclamados.
- Supervisar las ocupaciones territoriales existentes y responder a las solicitudes de mediación de la nación entre la misma y otras partes
- Facilitar la participación del Tercero Garante en las negociaciones como parte activa con un rol mutuamente determinado como monitor y ejecutor de los acuerdos finales.
- Notificar a las posibles partes sobre el marco de mediación y negociación para establecer relaciones amistosas entre las partes y ofrecer lugares para la participación.
- Facilitar las comunicaciones sobre la gobernanza consuetudinaria de las naciones, la estructura de los sistemas empresariales, estatales y de compradores.
- Facilitar las comunicaciones, la traducción y los idiomas habituales para maximizar la comprensión del compromiso entre las partes.
- Llevar a cabo comunicaciones de Asuntos Públicos en simposios, comunicados de prensa públicos, conferencias públicas y lanzamientos de documentales.

ORGANIZACIÓN:

Director: Supervisar y administrar la organización.

Personal de monitoreo: Documentar, evaluar y rastrear las actividades de la nación, las empresas, el estado y los compradores en relación con los territorios ancestrales en todo el mundo. Mantener la evaluación de las relaciones existentes y documentar las circunstancias de las relaciones entre las partes afectadas.

Personal diplomático: Involucrar a las partes estatales, nacionales, empresariales y

de compradores y multilaterales para facilitar la participación. Facilitar Terceros Garantes, observadores y afectados.

Personal de Comunicaciones: Desarrollar y mantener información lingüística, cultural, ambiental y geográfica para facilitar las comunicaciones entre naciones, naciones y estados y empresas e investigaciones.

Personal de Mediación: Involucrar directamente a las partes en conflicto y facilitar el entendimiento mutuo, reglas para negociaciones y consentimiento y garantías.

Personal de Asuntos Públicos: Desarrollar y producir información pública sobre el compromiso entre naciones, estados, empresas y compradores.

Investigadores de la materia: Los negociadores nacionales de consentimiento previo libre e informado deben tener acceso a información y recursos que incluyen 1. Análisis de riesgos y beneficios, 2. Roles y responsabilidades de todas las partes de los acuerdos, 3. Principios y arreglos de gobernanza, 4. Evaluaciones de impacto social y ambiental , 5. Evaluación de posibles conflictos internos dentro de la nación, 6. Estándares de evaluación para la implementación del acuerdo, 7. Evaluación y validación de la posición de las partes en las negociaciones, 8. Documentación de los flujos de ingresos, 9. Datos, registros y base de conocimiento, 10. Personal nacional y participación empresarial, 11. Análisis legal, 12 Evaluación de Capacidad de Partes.[21]

Marco para un mecanismo de CLPI[22]

Cada nación que ingresa a un proceso de CLPI debe recibir asistencia técnica y apoyo para determinar si una empresa o empresas y un estado pueden acceder a tierras ancestrales para desarrollar y extraer recursos naturales. El apoyo técnico y el desarrollo de capacidades ayudarán a garantizar que sea posible actuar libremente como un negociador igualitario.

No existen mecanismos para implementar las declaraciones o tratados de derechos humanos, excepto cuando los intereses de las entidades competidoras encuentran un beneficio mutuo en la implementación. En lugar de la "buena fe", la implementación depende de la "buena voluntad". La ausencia de mecanismos de implementación y cumplimiento en las leyes internacionales y estatales[23] para proteger directamente a las naciones de la explotación plantea la pregunta: "¿Cuáles son las opciones para establecer un

[21] Estos elementos se derivan de una lectura de las consideraciones clave establecidas por la Alianza de LNG de las Primeras Naciones que involucra a veintinueve comunidades indígenas y 63 acuerdos celebrados bajo el CLPI con Prince Rupert Gas Transmission; enlace de gas costero; Pacific Trail Pipeline y el proyecto Westcoast Connector Gas Transmission para construir un gasoducto en los territorios de 29 primeras naciones. https://benefits.fnlngalliance.com/critical-issues/

[22] Ryser, R., (2022) "A Framework for Implementing the Principle of Free, Prior and Informed Consent (FPIC) – Comity or Conflict." Fourth World Journal. Winter V21 N2 2022. p. 127

[23] En un documento publicado recientemente titulado "Conjunto de herramientas de implementación tribal" (2022) diseñado para que las naciones indígenas dentro de los Estados Unidos implementen la Declaración de las Naciones Unidas sobre los Derechos de los Pueblos Indígenas (UNDRIP), los autores de la Facultad de Derecho de la Universidad de Colorado, Native American Rights Fund y la Facultad de Derecho de la Universidad de California-Los Ángeles señalan repetidamente que no existen mecanismos de cumplimiento a nivel internacional para garantizar la conformidad con las disposiciones de la UNDRIP.

mecanismo que tenga la capacidad total para garantizar que las naciones sean partes activas en la protección de sus territorios y comunidades y o controlar las fuerzas sociales, económicas y políticas que explotan a las personas, los recursos y el medio ambiente para obtener ganancias económicas y poder?

El principio fundamental en el derecho internacional con respecto a la autoridad de las naciones indígenas se establece en la Resolución 1803[24] de la Asamblea General de la ONU, reconociendo que la soberanía y el autogobierno son fundamentales en el derecho internacional como se señala:

> El derecho de los pueblos y naciones a la soberanía permanente sobre sus riquezas y recursos naturales debe ejercerse en interés de su desarrollo nacional y del bienestar del pueblo del Estado en cuestión.[25]

Como pueblos originarios, las naciones indígenas se reservan la autoridad sobre sus tierras, riquezas y recursos naturales mientras que los estados buscan ejercer autoridad sobre las mismas tierras ancestrales de las naciones. Y la Resolución 1803 deja en claro que las violaciones de los derechos al ejercicio de su soberanía sobre los recursos naturales y otras riquezas son incompatibles con la Carta de la ONU.[26] La violación de tales derechos es contraria a la intención de las declaraciones, convenciones y tratados internacionales aprobados y ratificados desde la década de 1960. Estos acuerdos garantizan a las naciones indígenas el derecho a consentir o rechazar libremente las acciones administrativas, legislativas o judiciales que puedan ser contrarias a sus intereses.

El artículo 19 de la Declaración de las Naciones Unidas sobre los Derechos de los Pueblos Indígenas y otras disposiciones de la Declaración afirman la necesidad de que los estados y las naciones se comprometan de manera cooperativa con respecto a las medidas administrativas, legislativas y judiciales que tienen el potencial de afectar negativamente los intereses de las naciones. De manera similar, el Convenio 169 (1989) de la Organización Internacional del Trabajo contiene disposiciones en el artículo 16 sobre la reubicación de pueblos por parte de un estado "solo con el consentimiento libre e informado" de los pueblos indígenas afectados. El punto se enfatiza en el artículo 6 de la Convención al señalar que los compromisos entre los estados y las naciones "se llevarán a cabo, de buena fe y en una forma apropiada a las circunstancias, con el objetivo de lograr un acuerdo o consentimiento para las medidas propuestas". En ningún instrumento internacional, ni en ninguna otra convención o declaración relativa a las naciones indígenas, sus disposiciones para hacer cumplir el "requisito" de consentimiento o acuerdo de las naciones son excepto "buena fe".

La explotación de los territorios y pueblos ancestrales de las naciones por parte de los estados, las empresas y los compradores de materias primas extraídas de los territorios de las naciones se acelera y se expande a más y más tierras de las naciones. A medida que crece

[24] UNGA Resolution 1803 14 de diciembre 1962. "Permanent Sovereignty over Natural Resources." Asamblea General de las Naciones Unidas.

[25] Ibid. Párrafo 1.

[26] Ibid. Párrafo 7.

la riqueza y el poder de unos pocos estados, se pide "energía verde" para mitigar el daño que crece en todo el mundo. Todas las entidades preocupadas por estabilizar el cambio climático, revertir el colapso de la biodiversidad, prevenir la destrucción de los pueblos indígenas y prevenir el colapso de la sociedad humana en todo el mundo deben actuar para trabajar directamente a través de un mecanismo internacional mutuamente aceptable que pueda garantizar resultados beneficiosos para todas las partes. Establecer un nuevo mecanismo internacional con todas las partes contendientes sentadas a la mesa es un asunto urgente.

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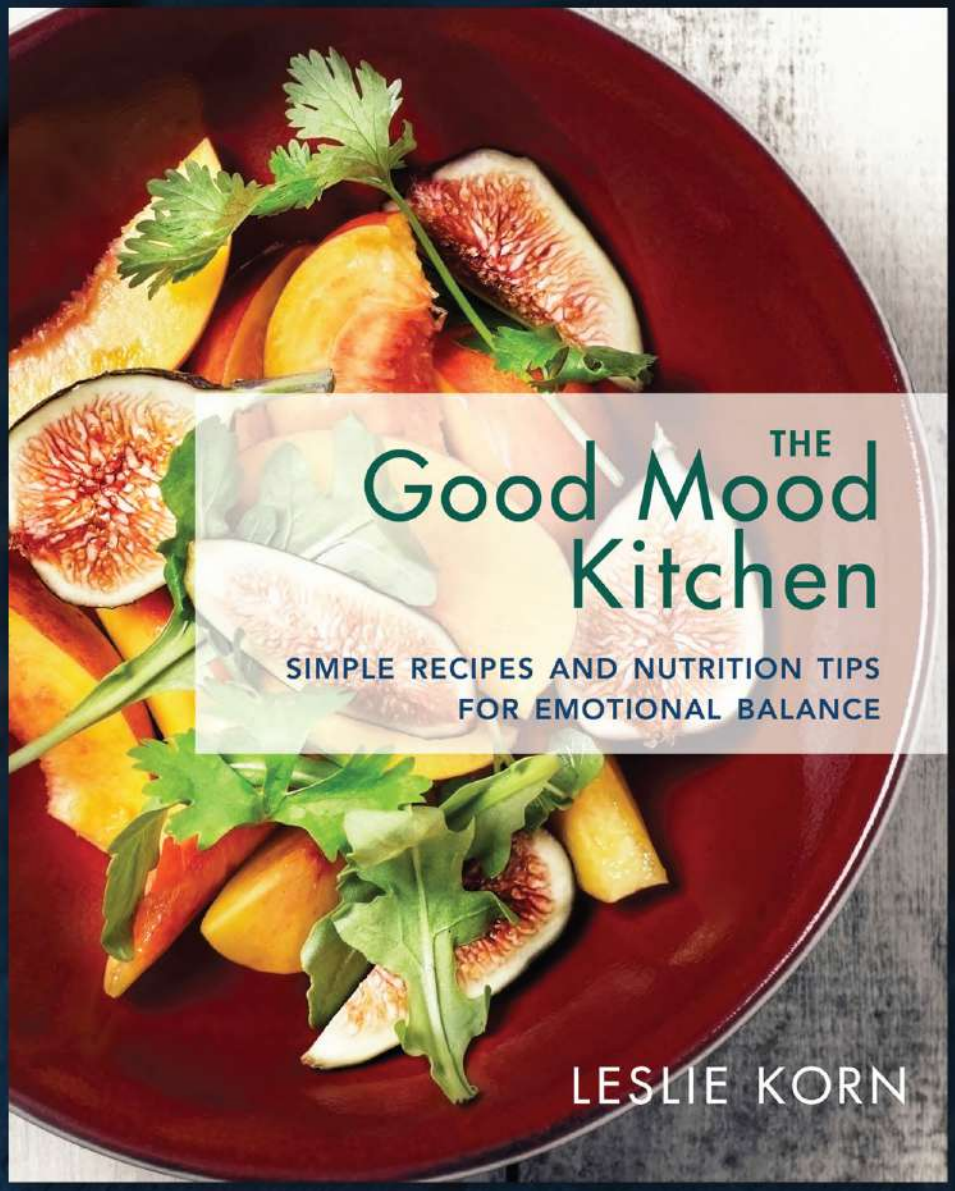

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